Attachment 13

Watercourse Crossings

(1,269 Pages)

Attachment 13.1

Fish Habitat Interactions Report

(68 Pages)

Subject: **Mary River Phase 2 Proposal Update: Project Infrastructure Interactions with Fresh Water Streams and Ponds**

To: Lou Kamermans
Baffinland Iron Mines Corporation
Environmental Superintendent
2275 Upper Middle Road East, Suite 300
Oakville, ON L6H 0C3

From: North/South Consultants Inc.
83 Scurfield Blvd.
Winnipeg, MB
R3Y 1G4

Date: May 1, 2019

1.0 INTRODUCTION

The Mary River Project is an operating iron ore mine located in the Qikiqtani Region of Nunavut. Baffinland Iron Mines Corporation (Baffinland; the Proponent) is the owner and operator of the Project. As part of the regulatory approval process, Baffinland submitted a Final Environmental Impact Statement (FEIS), which presented in-depth analyses and evaluation of potential environmental and socioeconomic effects associated with the Project, to the Nunavut Impact Review Board (NIRB).

In 2012, NIRB issued Project Certificate No 005 which provided approval for Baffinland to mine 18 million tonnes per annum (Mtpa) of iron ore, construct a railway to transport the ore south to a port at Steensby Inlet which operates year-round, and to ship the ore to market. The Project Certificate was subsequently amended to include the mining of an additional 4.2 Mtpa of ore, trucking this amount of ore by an existing road (the Tote Road) north to an existing port at Milne Inlet, and shipping the ore to market during the open water season. The total approved iron ore production was increased to 22.2 Mtpa (4.2 Mtpa transported by road to Milne Port, and 18 Mtpa transported by rail to Steensby Port). This is now considered the Approved Project. The 18 Mtpa Steensby rail project has not yet been constructed, however 4.2 Mtpa of iron ore is being transported north by road to Milne Port currently. Baffinland recently submitted a request for a second amendment to Project Certificate No.005 (the Early Revenue Phase [ERP] operation) to allow for a short-term increase in production and transport of ore via road through Milne Port from the current 4.2 Mtpa to 6.0 Mtpa.

Baffinland submitted an Addendum to the FEIS (the Phase 2 Proposal; the third project certificate amendment request) to NIRB in August, 2018. The Phase 2 Proposal will consist of a near-term expansion of the current 4.2 Mtpa ERP operation to 12 Mtpa, followed by the subsequent additional development of the originally approved 18 Mtpa South Rail operation. The near-term proposed expansion would include construction and operation of a North Railway (North Rail) adjacent to the Milne Inlet Tote Road.

The Phase 2 Proposal Technical Supporting Document (TSD) No. 14 (North/South Consultant Inc. [NSC] 2018) presented estimates of the amount of fish habitat that would be lost or altered due to construction of the North Rail and Tote Road realignments, and provided an initial screening assessment of potential effects on fish passage at the culvert crossings to assist with final detailed engineering design of the rail.

The assessment of the potential effects of the Project on Arctic Char (*Salvelinus alpinus*) was completed through a combination of empirical data collected through field surveys conducted prior to 2018 and a desktop assessment using detailed site imagery.

Since completion of the Phase 2 Proposal, the North Rail, the Tote Road realignment, Milne Port, and Mine Site infrastructure has undergone final detailed engineering design. This has resulted in a number of changes to the potential interactions with fresh water related to realignment of, and changes to, the design of the North Rail, the Tote Road, and other infrastructure. In turn, these changes have resulted in changes to the numbers, locations, and types of potential interactions with fish habitat.

In addition, a field program was completed in the open-water season of 2018 (early summer: June 28-July 11; and late summer/fall: August 23-September 3) to survey sites along the North Rail and at the Tote Road realignment that were assessed in the Phase 2 Proposal; results of this field program are presented in NSC (2019). The results of the field surveys also resulted in some changes to fish habitat designations initially identified in TSD 14 (NSC 2018) along these corridors.

This Technical Memorandum (TM) provides an update to the list of interactions between Phase 2 infrastructure, including the North Rail, Tote Road realignment, Mine Site and Milne Port infrastructure changes, and temporary roads, with fresh water and fish habitat. The update incorporates the following changes or additional information obtained since submission of the Phase 2 Proposal:

- Changes due to realignment of the North Rail (i.e., addition, relocation, and deletion of sites);
- Design changes in relation to rail infrastructure and interactions with fresh water including, but not limited to:
  - small adjustments in locations and bridge design features;
  - changes in the rail embankment widths;
  - elimination of some cut sites (i.e., replaced by culverts);
  - creation of new cut sites;
  - addition of stream infilling sites;
  - addition of water diversions and relocation of streams and ponds;
  - changes in corrugated steel pipe (CSP) stream crossing designs (e.g., number of barrels, lengths, slopes etc.);
  - changes in the type of culvert crossing at some sites (i.e., CSPs changed to plate arch culverts); and
  - changes in the locations and culvert design details for some lake and pond infilling sites;
- Realignment and final design of the Tote Road modifications;
- Final detailed design at Milne Port and Mine site areas;
- Selection of temporary road locations;
- Modifications to the lists of quarry and laydown areas;
- Acquisition of updated satellite imagery (2018); and
- Results of the 2018 field surveys (NSC 2019).

In addition to the updated list of Project infrastructure, this memo also updates the description of affected Arctic Char and Ninespine Stickleback (*Pungitius pungitius*) habitat relative to information presented in the Phase 2 Proposal. The description of affected habitat has been altered both due to design changes in the Project as well as the inclusion of data collected during the 2018 field surveys, which replaced desk top assessments conducted at many of the sites in the Phase 2 Proposal. It should be noted that some components of the design at the Mine site are still at the conceptual stage as initial review of the final engineering design at these locations identified the need for modifications to reduce impacts to fish and fish habitat.

A future report will provide an update to the estimates of fish habitat loss and/or alteration provided in the Phase 2 Proposal to reflect the updates in Project infrastructure and biological information noted above. This report will also provide details regarding methods and assumptions applied for the update to fish habitat designations and habitat loss/alteration. A brief overview of the approach and methods applied for derivation of the tables presented in this TM is provided below.

2.0 OVERVIEW OF METHODS AND APPROACH

2.1 NORTH RAIL, TOTE ROAD REALIGNMENT, MILNE PORT AND MINE AREAS

The following provides a description of the approach and methods, in relation to the Northern Transportation Corridor and infrastructure at the Milne Port and Mine areas, used to classify sites as fish habitat or not fish habitat.

Assessment of the potential effects of the Project on Arctic Char habitat along the Northern Transportation Corridor and at the Mine and Milne Port areas was completed through a combination of empirical data collected through field surveys and a desktop analysis using detailed site imagery.

The majority of sites (i.e., stream crossings, lake/pond encroachment/infilling, bridges, and cuts) were surveyed in the field in summer and late summer/fall 2018 and fish habitat designations were defined based on the results of these surveys (NSC 2019), in combination with results from previous field surveys or observations (e.g., incidental observation of char presence at a site) at a subset of the sites.

The final realignment of the Northern Transportation Corridor and design of Milne Port infrastructure affected the fish habitat designations identified following completion of the 2018 field survey for some sites. Changes included relocation, addition, and elimination of sites. To reconcile the 2018 field survey information and results with the new Road and Rail alignments, the following tasks were undertaken:

1. The previous and new alignments were visually compared using Geographic Information System (GIS) and satellite imagery and any changes to sites were identified.
2. Where sites were relocated but remained on the same stream or pond, the distance between the previous and new alignments was measured.
3. Where field surveys captured the area of the new centerline, field assessment results were retained for assigning fish habitat designations.
4. Where sites were relocated to a new stream, were relocated outside of the field assessed area, or for new sites not assessed in the field, a desktop assessment was completed to assign fish habitat designations.

2.1.1 Field-Surveyed Sites

Sites that were surveyed in the field in 2018 and/or in previous studies (e.g., Milne Inlet Tote Road monitoring) were classified as either fish-bearing or not fish-bearing based on the collective results of field studies. A site was designated as char/stickleback habitat if fish were observed on at least one occasion at or upstream of a site. Sites identified as not fish-bearing include:

- Sites upstream of a vertical barrier (impassable under all flows) and/or lacking connectivity to overwintering habitat;
- Sites that were not aquatic habitat (not a waterbody; e.g., low points); and
- Sites located in watersheds devoid of fish.

Sites were identified as “potential” fish habitat where:

- Sites were dry or little water was observed and were located upstream of a “soft barrier” (i.e., subsurface flow and/or steep vertical gradient). Fish had never been observed; and
- Sites were wetted during at least one survey but were located upstream of a soft barrier. Fish had never been observed.

In the latter instances, while fish have not been observed at or upstream of the sites and the sites appear to have impassable barriers to fish, these sites were ranked as “potential” char habitat due to uncertainties associated with accessibility for fish under other flow conditions and/or due to relatively limited field information.

Previous studies that were considered in the habitat designations include Milne Inlet Tote Road surveys and monitoring programs (Baffinland 2009, 2010, 2011, 2012a, 2013, 2014, 2015, 2016, 2017, and 2018; Knight Piésold 2007a,b, 2008) and baseline field programs (Baffinland 2012b, NSC 2008).

2.1.2 Relocated and New Sites

For sites that were relocated, relative to the Phase 2 Proposal, but remained on the same watercourse, fish habitat designations were identified as follows:

- Each site (previous and new) was reviewed using GIS and the distance between the previous and new location was measured;
- Sites that were relocated within the field surveyed area (i.e., generally from 100 m upstream to 100 m downstream of the crossing), were classified based on the field surveys, incorporating site-specific information at the relocated site; and
- Sites that were relocated outside of the field-surveyed area and new sites were assessed through a desktop analysis, but incorporating field information (i.e., presence of impassable barriers).

For streams and waterbodies for which there was inadequate or no existing field information (i.e., those falling into category 4 above), a desktop analysis was conducted to classify streams/ponds as fish-bearing or non-fish bearing. The approach applied a combination of review of 2018 (collected from July-September) orthophotography (50 centimetre [cm] resolution) and digitally-derived elevation contours (1 m) to identify potential barriers to fish passage, including steep gradients (e.g., falls), lack of surface water, lack of connectivity of a stream with overwintering habitat (i.e., lakes), and lack of an identifiable stream channel. Gradients from orthophotographs were estimated at the steepest location along a stream by measuring the angle generated from a known change in vertical elevation over a horizontal distance (typically 5-10 m). Based on field observations along the Tote Road, stream gradients exceeding 10° generally limit or block movements of fish known to use local habitat (Ninespine Stickleback and juvenile Arctic Char), particularly in very shallow, low-flow streams. At that angle, vertical drops of 20-50 cm are common along the Tote Road alignment. Additional details regarding the desktop analysis approach are provided in NSC (2018).

2.1.3 Fish Habitat Classification

Final designations of Arctic Char and Ninespine Stickleback habitat were assigned based on the criteria summarized in Table 1. The “potential” categories identify sites where no fish have been captured or observed during field surveys but there is uncertainty whether fish may use/access these sites under higher flow/water level conditions.

Table 1. Classification of fish habitat along the Northern Transportation Corridor and Mine and Milne Port areas.

Fish-Bearing	Description
Yes	Fish observed and/or captured in 2018 and/or previous years or observed upstream.
No	Site upstream of a vertical barrier (impassable under all flows) and/or lack of connectivity to overwintering habitat observed in field or estimated through desktop assessment.
Potential	Dry or little water observed and upstream of a "soft barrier" (i.e., subsurface flow and/or vertical gradient). Fish not captured/observed during any field program.
Potential	Wetted in 2018 and/or during one or more previous surveys but upstream of a soft barrier. Fish not captured/observed during any field program. Or Desktop assessment indicates potential soft barrier.
No	Not aquatic habitat (not a waterbody, e.g., low points).
No	Species not present in watershed and/or habitat not suitable for use.
Potential	Site was dry when surveyed but no downstream barriers observed; site was wetted but fish not observed (e.g., too turbid) and no barriers observed.

A qualitative habitat rating was assigned to each waterbody as follows:

- No Fish Present: not fish-bearing based on surveys completed in 2018 and in previous years of surveys completed under the Mary River Project;
- Marginal Habitat: provides limited quantity or quality of habitat; or
- Important Habitat: easily accessible to fish and provides abundant, suitable habitat for one or more life stages.

2.2 TEMPORARY ROADS AND QUARRY AND LAYDOWN AREAS

The presence of waterbodies and fish habitat within the proposed quarry and laydown areas was assessed through a desktop assessment that also incorporated results from past field surveys or observations (e.g., incidental observation of char presence at a site) where available for that specific site.

Temporary access roads required for construction of the North Rail and for quarry and laydown area access have not yet been designed in detail. Preliminary access corridors to the proposed rail alignment have been drawn to identify general areas where road work could occur. Quarry and laydown road access is more advanced with potential routes identified but further detailed design is needed to finalize them. Locations were identified by the engineering consultant and provided for desktop review for the potential presence of fish habitat within the identified polygons. Where feasible temporary roads will be constructed to avoid streams and ponds.

The desktop analysis addressed three objectives:

- Identify the potential for temporary roads and quarry and laydown areas to interact with waterbodies within the identified polygons;
- Identify areas where effects on fish habitat could occur (i.e., where affected waterbodies are known or potential fish habitat), with subsequent consideration of mitigation through avoidance of habitat; and
- Identify potential for effects on fish and fish habitat.

The desktop review applied the same general approaches as described in Section 2.1.1. Some mitigation was applied following initial review of the quarry, laydown, and access road areas, including removal of a site or relocation of the polygon boundaries to avoid fish habitat.

3.0 INTERACTIONS AND FISH HABITAT DESIGNATIONS

Interactions with Project infrastructure and fish habitat are presented for the following components/areas as follows:

- Milne Port: Appendix 1; Table A1-1 and Map 1;
- North Rail: Appendix 2; Table A2-1 and Maps 1-12;
- Milne Inlet Tote Road: Appendix 3; Table A3-1 and Maps 1-5;
- Mine Site: Appendix 4; Table A4-1 and Map 1; and
- Temporary Roads and Quarry and Laydown Areas: Appendix 5; Tables A5-1 to A5-4 and Maps 1-12.

For Milne Port, the North Rail, the Tote Road realignment sites, and the Mine Site, the tables provided in Appendix 1-4 present the following information:

- Site IDs: Site IDs were kept consistent with the sites assessed in the Phase 2 Proposal EIS and the 2018 field surveys where sites were either unchanged or moved short distances and remained within the same waterbody. New sites or sites that moved to a new waterbody were assigned new unique site IDs.
- Type of Interaction: Infrastructure will result in a number of different interactions with fresh water, which is included in the appendix tables. A summary of the types of interactions is provided in Table 2.
- Waterbody Type: Waterbody types included streams (S), ponds (P), stream/pond (S/P), and low points (LP), and low point/stream (LP/S). A designation of S/P was assigned where infrastructure would affect both stream and pond habitat at a given site (e.g., rail crosses mouth of stream and portion of a pond). Low points are sites identified by Project engineers as requiring drainage but are not waterbodies. LP/S represents cases where the site appeared to be an isolated low point, but may have flows under extreme high water levels. Culverts installed for drainage that are not within waterbodies are identified as “water management”.
- Chainage: Rail Chainage (where applicable).
- UTMs: Easting and Northing coordinates for each site.
- Fish Habitat Designations - char and stickleback: Each site is designated as fish habitat (Y), not fish habitat (N), or potential fish habitat (P). See Section 2.0 and Table 1 for additional information regarding classifications.
- Field Surveyed (Y/N and years): Information on whether a site has been previously surveyed in the field and the year(s) of the surveys.
- Summary of Changes Relative to the Phase 2 Proposal and 2018 Field Program: Information is included identifying whether a site has moved relative to the Phase 2 Proposal alignment or is a new site not previously identified. Where a site has moved, the approximate distance of the move is included.
- Basis of Fish Habitat Designation: Information is included regarding whether a site was assessed in the field or through desktop analysis.

For the temporary access roads and quarry and laydown areas, the tables present:

- Site IDs: Site IDs were kept consistent with the sites assessed in the Phase 2 Proposal EIS and the 2018 field surveys where sites were either unchanged or moved short distances and remained within the same waterbody. New sites or sites that moved to a new waterbody were assigned new unique site IDs.
- Presence/Absence of Waterbody: Waterbody present (Y) or absent (N) in polygon.
- Waterbody Type: Waterbody types include streams and ponds.
- UTMs: Easting and Northing coordinates for each site/polygon.
- Fish Habitat Designations - char and stickleback: Each site is designated as fish habitat, not fish habitat, or potential fish habitat. See Section 2.0 for additional information regarding classifications.
- Impacts to Fish Habitat: Description of whether impacts to fish habitat can be avoided (Y/N).

Table 2. Description of types of interactions between Project infrastructure and fresh water.

Interaction Type	Description
Culvert	CSP installation on a stream or LP
Plate Arch Culvert	Plate arch culvert stream crossing
Bridge	Bridge installation on a stream
Pond Infilling	Pond will be infilled
Pond Infilling/Encroachment + Culvert	Pond will be partially infilled; culverts will be installed
Pond Encroachment	Rail embankment infringes on pond habitat
Cut	Rail construction will involve a cut at a stream, pond, or LP
Stream Diversion	Water to be diverted due to infilling and/or or water management
Daylight + Culvert	Water in a cut will be conveyed with a CSP culvert and flow will be daylighted
Pond Infilling/Encroachment + Stream Crossing	Project infrastructure crosses a stream and a pond
Stream Infilling	Infrastructure results in infilling of a portion of a stream

4.0 LITERATURE CITED

Baffinland Iron Mines Corporation (Baffinland), 2009. Mary River Project Bulk Sampling Program - Tote Road Upgrades, Fish Habitat Monitoring 2008 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2010. Mary River Project Bulk Sampling Program - Tote Road Upgrades, Fish Habitat Monitoring 2010 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2011. Mary River Project Bulk Sampling Program - Tote Road Upgrades, Fish Habitat Monitoring 2011 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2012a. Mary River Project Bulk Sampling Program - Tote Road Upgrades, Fish Habitat Monitoring 2012 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2012b. Mary River Project - Final Environmental Impact Statement. Volume 7: Freshwater Environment. February 2012.

Baffinland. 2013. Mary River Project Bulk Program - Tote Road Upgrades, Fish Habitat Monitoring 2013 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2014. Mary River Project Early Revenue Phase - Tote Road Upgrades, Fish Habitat Monitoring 2014 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2015. Mary River Project Early Revenue Phase - Tote Road Upgrades, Fish Habitat Monitoring 2015 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2016. Mary River Project Early Revenue Phase - Tote Road Upgrades, Fish Habitat Monitoring 2016 Annual Report to Department of Fisheries and Oceans.

Baffinland. 2017. Mary River Project - Tote Road Upgrades, Fish Habitat Monitoring, 2017 Annual Report, Early Revenue Phase, Tote Road Upgrades. Annual Report to Department of Fisheries and Oceans.

Baffinland. 2018. Mary River Project - Tote Road Upgrades, Fish Habitat Monitoring, 2018 Annual Report, Early Revenue Phase, Tote Road Upgrades. Annual Report to Department of Fisheries and Oceans.

Knight Piésold Ltd. 2007a. Baffinland Iron Mines Corporation, Mary River Project Bulk Sampling Program, Fish Habitat No Net Loss and Monitoring Plan. North Bay, Ontario. Ref. No. NB102-00181/10-4.

Knight Piésold Ltd. 2007b. Baffinland Iron Mines Corporation, Mary River Project Bulk Sampling Program - Tote Road Upgrades, Fish Habitat Monitoring 2007 Annual Report to Department of Fisheries and Oceans. North Bay, Ontario. Ref. No. NB102-00181/10-8.

Knight Piésold Ltd. 2008. Baffinland Iron Mines Corporation, Mary River Project Bulk Sampling Program, Road Upgrades. Fish Habitat Monitoring 2008 Annual Report to Department of Fisheries and Oceans. North Bay, Ontario. Ref. No. NB102-00181/13-1.

North/South Consultants Inc. (NSC). 2008. Freshwater Aquatic Environment Baseline Report: Fish and Fish Habitat. A report prepared for Knight Piésold Ltd. and Baffinland Iron Mines Corporation by North/South Consultants Inc., Winnipeg, Manitoba. 182 p. + appendices.

NSC. 2018. Mary River Project - Phase 2 Proposal - Technical Supporting Document No. 14, Freshwater Biota and Habitat Assessment. August 2018.

NSC. 2019. Mary River Project - Phase 2 Proposal North Railway Freshwater Habitat Survey: 2018. Prepared for Baffinland Iron Mines Corporation by North/South Consultants Inc., Winnipeg, Manitoba. 31 p. + appendices. April 2019.

APPENDIX 1: LIST OF PROJECT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER AND FISH HABITAT DESIGNATIONS: MILNE PORT AREA

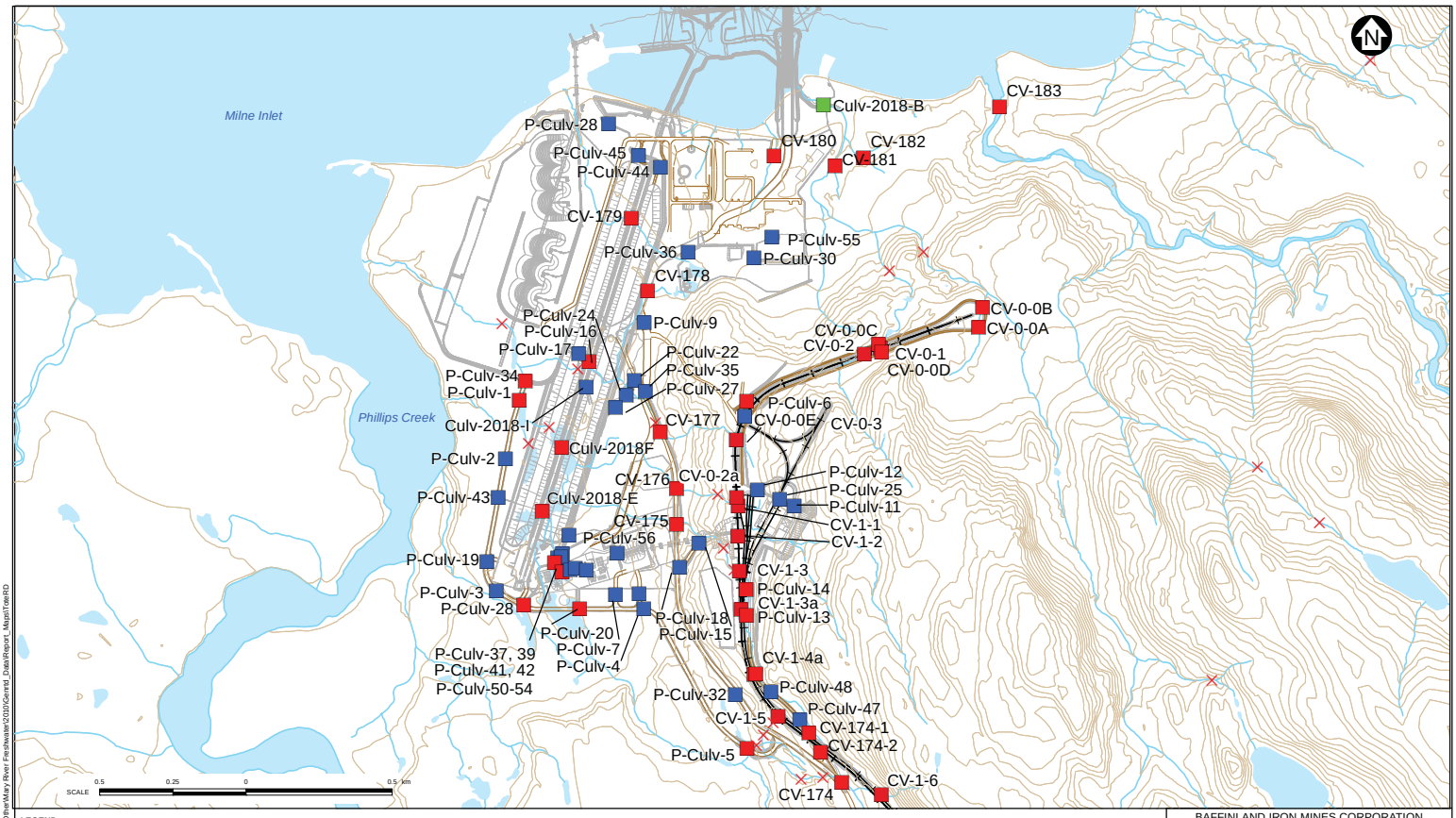
TABLE A1-1. LIST OF MILNE PORT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion to	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Milne (Rail)	CV-0-1	Daylight + Culvert	S		CV-0-2	330	504289	7975593	1	12	900	1	N	NFB	N	NFB	Y	2009 (2)	NC	-	-	Y	N
Milne (Rail)	CV-0-2	Cut	S	CV-0-1		387	504234	7975572	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (2)	NC	-	-	Y	N
Milne	Culv-2018-B	Culvert	S				504093	7976424	4	40.0	1200	0.5	Y	MARG	N	NFB	Y	2008 (1) 2009 (2)	New	n/a	Y	Y (Rail CV-0-1 and CV-0-2)	-
Milne	Culv-2018-E	Pond Infilling + Culvert	P				503131	7975035	1	30.7	600	0.2	N	NFB	N	NFB	Y	2008 (1)	New	n/a	Y	Y (Rail CV-0-1 and CV-0-2)	-
Milne	Culv-2018-F	Pond Infilling + Culvert	P				503199	7975251	1	30.0	600	0.2	N	NFB	N	NFB	Y	2008 (1)	New	n/a	Y	Y (Rail CV-0-1 and CV-0-2)	-
Milne	Culv-2018-I	Culvert	None - Water Mgmt				503282	7975458	1	27.3	600	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-1	Pond Infilling + Culvert	P				503053	7975413	1	16.1	600	0.3	N	NFB	N	NFB	N	2008 (1)	New	-	-	-	Y
Milne	P-Culv-11	Culvert	None - Water Mgmt				503993	7975052	1	59.9	600	0.1	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-12	Culvert	None - Water Mgmt				503867	7975108	1	53.9	600	0.1	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-13	Pond Infilling + Culvert	P				503829	7974679	1	52.331	600	2.4	N	NFB	N	NFB	Y	n/a	New	-	Y	Y (Milne Port 2018 Survey)	-
Milne	P-Culv-14	Culvert	P				503829	7974767	1	53.795	600	2.8	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-15	Culvert	None - Water Mgmt				503668	7974925	1	15.0	600	3.9	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-16	Culvert	S				503291	7975547	2	39.9	1200	0.3	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-17	Culvert	None - Water Mgmt				503257	7975573	1	22.2	1200	0.4	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-18	Culvert	None - Water Mgmt				503602	7974843	1	25.4	600	0.5	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-19	Culvert	None - Water Mgmt				502942	7974862	1	21.7	600	0.5	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-2	Culvert	None - Water Mgmt				503005	7975214	1	16.4	600	0.6	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-20	Pond Infilling + Culvert	P				503260	7974699	1	22.1	900	1.3	N	NFB	N	NFB	Y	2008 (1)	New	-	Y	Y (Milne Port 2018 Survey)	-
Milne	P-Culv-22	Culvert	None - Water Mgmt				503447	7975482	2	34.0	900	0.9	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-23 (CV-1-4a)	Culvert	S		East Berm		503855	7974475	2	35.9	900	1.1	N	NFB	N	NFB	N	n/a		26	Y	Y	N
Milne	P-Culv-24	Culvert	None - Water Mgmt				503418	7975431	1	11.2	600	2.9	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne (Rail)	CV-1-5	Culvert	LP		CV-1-6	1923	503938	7974336	1	48	1500	5	N	NFB	N	NFB	Y	N/A	NC	-	-	Y	N
Milne (Rail)	CV-1-6	Cut	S	CV-1-5		2369	504292	7974064	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	N
Milne	P-Culv-25	Culvert	None - Water Mgmt				503943	7975074	1	10.2	1200	0.9	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-27	Culvert	None - Water Mgmt				503383	7975389	1	5.3	600	4.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-28	Culvert	None - Water Mgmt				503359	7976360	1	13.0	600	1.6	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-3	Culvert	None - Water Mgmt	Stream south of infra.			502974	7974761	1	19.5	600	2.8	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-30	Culvert	None - Water Mgmt				503856	7975900	1	12.8	900	1.8	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-32	Culvert	None - Water Mgmt		P-Culv-23 or CV-1-4a		503793	7974407	2	24.2	900	4.8	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-33	Culvert	None - Water Mgmt				503463	7974751	1	17.9	900	4.8	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-34	Culvert	S				503074	7975479	1	18.9	600	0.3	N	NFB	N	NFB	N	2008 (1)	New	-	-	-	Y
Milne	P-Culv-35	Culvert	None - Water Mgmt				503484	7975444	2	33.2	600	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-36	Culvert	None - Water Mgmt				503631	7975920	1	5.3	600	4.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-37	Culvert	None - Water Mgmt				503184	7974875	1	21.6	1200	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-38	Pond Encroachment + Culvert	P				503068	7974713	1	25.4	1200	0.2	N	NFB	N	NFB	Y	2008 (1)	New	-	Y	Y (Milne Port 2018 Survey)	-
Milne	P-Culv-39	Culvert	None - Water Mgmt				503200	7974888	1	14.0	1200	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-4	Culvert	None - Water Mgmt				503479	7974700	1	18.2	600	3.0	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-40	Culvert	None - Water Mgmt				503222	7974952	1	11.6	600	1.5	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-41	Culvert	None - Water Mgmt				503196	7974877	1	5.6	600	0.7	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-42	Pond Infilling + Culvert	P				503173	7974859	1	6.1	600	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-43	Culvert	None - Water Mgmt				502981	7975082	1	16.7	600	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-44	Culvert	None - Water Mgmt				503537	7976212	1	22.5	900	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-45	Culvert	None - Water Mgmt				503461	7976251	1	22.0	900	0.5	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-47	Culvert	None - Water Mgmt				504013	7974321	1	18.6	600	2.3	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-48	Culvert	None - Water Mgmt				503913	7974415	1	19.5	600	0.2	N	NFB	N	NFB	N	n/a	New	-	-	-	Y

TABLE A1-1. LIST OF MILNE PORT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion to	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Milne	P-Culv-5	Stream Infilling + Pond Infilling	S/P				503832	7974223	2	45.2	1200	0.5	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-50	Pond Infilling + Culvert	P				503199	7974827	1	3.5	600	0.3	N	NFB	N	NFB	Y	2008 (1)	New	-	-	-	Y
Milne	P-Culv-51	Culvert	None - Water Mgmt				503227	7974834	1	3.5	600	0.3	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-52	Culvert	None - Water Mgmt				503244	7974839	1	3.5	600	0.3	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-54	Culvert	None - Water Mgmt				503282	7974831	1	3.5	600	2.6	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-55	Culvert	None - Water Mgmt				503917	7975972	1	10.2	600	0.5	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-56	Culvert	None - Water Mgmt				503387	7974890	1	37.2	600	2.1	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-6 (CV-0-1a)	Culvert	None - Water Mgmt				503824	7975359	1	61.4	1200	0.3	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-7	Culvert	None - Water Mgmt				503383	7974748	1	16.4	900	1.7	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne	P-Culv-9	Culvert	None - Water Mgmt				503479	7975680	1	23.8	600	2.3	N	NFB	N	NFB	N	n/a	New	-	-	-	Y
Milne (Road)	CV-0-0B	Culvert	S				504637	7975731	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Milne (Road)	CV-0-0A	Culvert	S				504625	7975663	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Milne (Road)	CV-0-0C	Culvert	S				504282	7975606	1	12	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Milne (Road)	CV-0-0D	Culvert	S				504293	7975578	1	12	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Milne (Road)	CV-0-0E	Culvert	LP				503831	7975411	2	24	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Milne (Road)	CV-174-1	Culvert	LP				504044	7974276	1	42	1500	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Milne (Road)	CV-174-2	Culvert	LP				504084	7974210	1	42	600	5	N	NFB	N	NFB	N	-	New	-	-	-	Y

N/A = not applicable; L = lake; LP = low point; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important; M = Moved; NC = No Change.
[1] M = moved but still in field survey area



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES
- NO WATERBODY - WATER MANAGEMENT ONLY

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHT'S OF CANADA DEPARTMENT OF NATURAL RESOURCES (2006) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS PORT SITE

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO. -
REF NO. -
DATE: 01/05/2019
REV -

Path: \\terastation\GISProjects\Other\Mary River Freshwater\2010\General_Data\Report_Maps\TotePRD

APPENDIX 2: LIST OF PROJECT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER AND FISH HABITAT DESIGNATIONS: NORTH RAIL

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-1-7	Cut	S	CV-1-9		2911	504662	7973667	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-1-8	Cut	S	CV-1-9		3247	504895	7973426	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-1-9	Daylight + Culvert	S		CV-1-7 & CV-1-8	3301	504926	7973382	1	18	900	1	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-2-1	Daylight + Culvert	S			3648	505155	7973123	1	18	900	1	N	NFB	N	NFB	Y	2009 (2)	NC	-	-	Y	-
Rail	CV-2-2	Daylight + Culvert	S			3731	505217	7973068	1	18	900	1	N	NFB	N	NFB	Y	2009 (2)	NC	-	-	Y	-
Rail	CV-3-1	Culvert	LP			3964	505391	7972912	1	18	900	1	N	NFB	N	NFB	M	-	Moved	14	Y	Y	N
Rail	CV-3-2	Culvert	S			4009	505423	7972880	1	12	900	1	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-4-1	Daylight + Culvert	S			4403	505694	7972594	1	12	900	5	N	NFB	N	NFB	M	2009 (2) 2013 (1) 2015 (1) 2017 (1)	Moved	30	Y	Y	N
Rail	CV-4-2	Culvert	S			4513	505769	7972515	1	12	900	1	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-4-3	Daylight + Culvert	S			4617	505836	7972435	1	12	900	1	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-4-4	Culvert	S			4687	505898	7972378	1	36	900	1	N	NFB	N	NFB	M	2009 (2) 2013 (1) 2015 (1) 2017 (1)	Moved	40	Y	Y	N
Rail	CV-4-4a	Culvert	LP			4826	505985	7972287	1	12	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-4-5	Culvert	S			4947	506066	7972198	1	18	900	1	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-5-1	Culvert	S			5138	506166	7972036	3	12	900	1	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-5-2	Culvert	LP			5180	506185	7971998	1	12	900	1	N	NFB	N	NFB	Y	None	NC	-	-	Y	-
Rail	CV-5-3	Daylight + Culvert	S			5408	506308	7971808	1	12	1500	1	N	NFB	N	NFB	M	2009 (2) 2013 (1) 2015 (1) 2017 (1)	Moved	21	Y	Y	N
Rail	CV-5-4	Daylight + Culvert	S			5706	506541	7971623	1	12	900	1	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-5-5	Cut	S	CV-5-7		5838	506643	7971540	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-5-6	Cut	S	CV-5-7		5861	506661	7971526	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (2) 2013 (1) 2015 (1) 2017 (1)	NC	-	-	Y	-
Rail	CV-5-7	Daylight + Culvert	LP		CV-5-5 and CV-5-6	6022	506775	7971413	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-6-0	Culvert	LP			6199	506892	7971280	3	18	900	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-6-1	Culvert	LP			6239	506918	7971250	2	24	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-6-2	Daylight + Culvert	LP			6557	507167	7971066	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-6-3	Daylight + Culvert	S			6845	507413	7970906	2	12	900	1	N	NFB	N	NFB	Y	2009 (2)	NC	-	-	Y	-
Rail	CV-6-4	Daylight + Culvert	S			6936	507474	7970839	1	12	900	1	N	NFB	N	NFB	Y	2009 (2)	NC	-	-	Y	-
Rail	CV-7-1	Culvert	LP			7342	507727	7970521	3	18	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-7-2	Culvert	LP			7593	507884	7970325	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-7-3	Culvert	LP			7762	507989	7970193	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-7-5	Culvert	LP			7866	508054	7970112	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-7-6	Culvert	LP			7909	508081	7970078	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-8-0a	Culvert	LP			8030	508155	7969983	1	12	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-8-0	Culvert	S			8303	508289	7969746	3	24	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-8-1	Culvert	S			8343	508311	7969712	1	30	1200	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-8-2	Culvert	S			8380	508317	7969674	1	30	1200	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-8-3	Culvert	S			8464	508342	7969594	1	24	1200	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-8-4	Culvert	LP			8727	508425	7969345	1	18	900	5	N	NFB	N	NFB	M	-	Moved	19	Y	Y	N
Rail	CV-8-5	Culvert	LP			8795	508458	7969285	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-8-6	Culvert	LP			8955	508556	7969159	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-9-1	Culvert	S			9337	508806	7968873	1	12	1500	1	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-9-2	Culvert	LP			9778	509061	7968515	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-10-1	Culvert	LP			10149	509340	7968271	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-10-2	Culvert	LP			10562	509655	7968003	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-10-5	Culvert	S			10834	509852	7967817	1	30	900	5	N	NFB	N	NFB	M	2009 (1)	Moved	22	Y	Y	N
Rail	CV-11-1	Culvert	LP			10892	509887	7967771	1	48	900	5	N	NFB	N	NFB	M	-	Moved	70	Y	Y	N
Rail	CV-11-2	Culvert	LP			11224	510100	7967520	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-11-2a	Culvert	LP			11292	510159	7967486	2	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-11-3	Daylight + Culvert	S			11358	510220	7967461	1	12	900	4	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-11-4	Culvert	LP			11632	510489	7967407	1	12	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-11-5	Culvert	LP			11736	510590	7967383	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-11-6	Culvert	LP			11809	510658	7967358	1	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-11-7	Culvert	LP			11921	510761	7967314	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-12-1	Culvert	LP			12115	510945	7967254	1	42	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-12-2	Culvert	LP			12191	511020	7967242	1	30	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-12-4	Culvert	LP			12490	511315	7967194	1	12	900	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-12-4b	Culvert	LP			12632	511455	7967168	1	12	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-12-5	Culvert	S			12731	511552	7967152	1	12	900	2	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-13-1	Culvert	LP			12963	511782	7967119	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-13-2	Culvert	LP			13218	512025	7967045	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-13-4	Culvert	S			13683	512419	7966799	5	24	1800	1	Y	IMP	Y	MAR	Y	2008 (2) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-13-5	Culvert	S			13846	512557	7966713	1	12	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-13-6	Culvert	LP			14412	513067	7966473	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-14-1	Culvert	LP			14600	513250	7966428	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-14-2	Pond Infilling + Culvert	P			14793	513435	7966375	2	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-14-3	Pond Infilling + Culvert	P			14900	513534	7966333	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-15-1	Culvert	LP			14996	513621	7966292	1	12	1500	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-15-2	Pond Infilling + Stream Crossing	S/P			15186	513774	7966181	1	30	900	1	Y	MAR	Y	IMP	Y	-	NC	-	-	Y	-
Rail	CV-15-3	Pond Infilling + Culvert	P			15378	513893	7966031	1	36	900	1	Y	MAR	Y	IMP	Y	-	NC	-	-	Y	-
Rail	CV-15-4	Pond Infilling	P			15774	514123	7965711	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-15-5	Bridge	S			15917	514238	7965626	N/A	N/A	N/A	N/A	Y	IMP	N	NFB	Y	2006 (1) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-16-2	Pond Infilling	P			16682	514751	7965084	N/A	N/A	N/A	N/A	N	NFB	N	NFB	M	-	Moved	9	Y	Y	N
Rail	CV-16-2a	Culvert	S			16733	514766	7965035	1	24	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-16-3	Culvert	S			16856	514801	7964917	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-17-1a	Pond Infilling + Culvert	P			17759	515217	7964118	1	12	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-17-1	Pond Infilling + Culvert	P			17862	515266	7964028	1	18	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-18-1	Pond Infilling + Culvert	P			18054	515334	7963849	1	30	1500	1	N	NFB	Y	IMP	Y	2009 (2)	NC	-	-	Y	-
Rail	CV-18-2	Culvert	S			18225	515411	7963696	1	24	900	2	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-18-3	Culvert	LP			18588	515620	7963400	1	18	900	1	N	NFB	N	NFB	M	-	Moved	18	Y	Y	N
Rail	CV-18-4	Culvert	LP			18679	515685	7963336	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-19-1	Culvert	S			18956	515915	7963183	1	24	900	1	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-19-2	Pond Infilling + Culvert	P			19237	516155	7963036	1	30	900	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-19-3	Culvert	LP			19984	516675	7962519	1	18	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-19-4	Culvert	LP			20159	516801	7962399	1	18	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-19-5	Culvert	LP			20286	516910	7962333	1	12	900	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-20-2	Culvert	S			20767	517283	7962037	1	12	900	1	N	NFB	N	NFB	M	2009 (1)	Moved	20	Y	Y	N
Rail	CV-21-1	Culvert	LP			20937	517396	7961909	1	12	900	5	N	NFB	N	NFB	M	-	Moved	19	Y	Y	N
Rail	CV-21-2	Culvert	LP			21299	517635	7961638	1	18	900	1	N	NFB	N	NFB	M	-	Moved	21	Y	Y	N
Rail	CV-21-3	Culvert	S			21741	517927	7961306	1	24	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-22-1	Pond Infilling + Culvert	P			22120	518113	7960977	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-22-2	Pond Encroachment	P	CV-22-3		22499	518232	7960617	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-22-3	Culvert	LP		CV-22-2	22660	518282	7960464	2	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-22-5	Culvert	LP			22984	518384	7960157	2	12	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-23-1	Culvert	LP			23167	518441	7959983	1	24	900	3	N	NFB	N	NFB	M	-	Moved	30	Y	Y	N
Rail	CV-23-2	Culvert	S			23416	518520	7959747	1	18	900	1	N	NFB	N	NFB	M	2009 (1)	Moved	52	Y	Y	N
Rail	CV-23-3	Culvert	LP			23790	518698	7959419	1	12	900	5	N	NFB	N	NFB	Y	None	NC	-	-	Y	-
Rail	CV-23-4	Culvert	LP			23910	518764	7959319	1	18	900	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-24-1	Culvert	LP			24348	518986	7958942	1	24	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-24-2	Culvert	LP			24639	519082	7958667	1	24	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-24-3	Culvert	S			24947	519230	7958399	1	24	1800	3	N	NFB	N	NFB	N	-	Moved	103	N	N	Y
Rail	CV-24-4	Culvert	LP			25109	519339	7958279	1	18	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-25-2	Culvert	S			25318	519502	7958148	1	18	900	1	N	NFB	N	NFB	Y	2009 (2) 2015-2017 (1 each)	NC	-	-	Y	-
Rail	CV-25-3	Culvert	S			25538	519670	7958007	1	30	900	1	N	NFB	N	NFB	Y	2009 (2) 2015-2017 (1 each)	NC	-	-	Y	-
Rail	CV-25-4	Culvert	LP			25728	519780	7957853	3	12	1200		N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-26-1	Pond Infilling + Culvert	P			26184	519989	7957450	1	18	900	1	N	NFB	N	NFB	M	2009 (2) 2015-2017 (1 each)	Moved	10	Y	Y	N
Rail	CV-26-3	Culvert	LP			26485	520160	7957202	3	12	900	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-26-4	Culvert	LP			26590	520220	7957116	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-26-5	Culvert	LP			26886	520368	7956861	1	18	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-27-1	Culvert	LP			26982	520393	7956768	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-27-2	Culvert	S			27016	520400	7956735	3	12	1500	1	Y	MAR	N	NFB	Y	2006 (1) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-27-2A	Culvert	LP			27210	520417	7956542	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-27-2B	Culvert	LP			27422	520470	7956337	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-27-3	Culvert	LP			27534	520516	7956235	1	18	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-27-4	Culvert	LP			27649	520564	7956130	1	18	1200	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-27-5	Culvert	LP			27972	520698	7955836	1	12	900	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-28-2	Culvert	S			28098	520749	7955721	2	18	900	1	N	NFB	N	NFB	Y	2009 (2)	NC	-	-	Y	-

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-28-2a	Culvert	LP			28191	520781	7955634	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-28-3	Culvert	LP			28568	520894	7955275	1	24	900	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-28-4	Culvert	LP			28664	520936	7955188	1	24	900	1	N	NFB	N	NFB	M	-	Moved	11	Y	Y	N
Rail	CV-28-6	Culvert	S			28943	521102	7954965	2	24	1500	5	Y	IMP	N	NFB	Y	2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-28-7	Culvert	S			29294	521315	7954688	1	12	900	5	N	MAR	N	NFB	M	-	Moved	17	Y	Y	N
Rail	CV-29-1	Culvert	S			29382	521354	7954609	1	18	900	5	N	MAR	N	NFB	M	-	Moved	13	Y	Y	N
Rail	CV-29-2	Culvert	S			29476	521389	7954522	3	36	1500	3	Y	IMP	N	NFB	M	2009 (2) 2013-2017 (1 each)	Moved	12	Y	Y	N
Rail	CV-29-3	Culvert	S			29706	521476	7954308	1	18	900	5	N	NFB	N	NFB	M	2009 (1)	Moved	13	Y	Y	N
Rail	CV-29-4	Culvert	S			29832	521512	7954187	1	18	900	5	N	NFB	N	NFB	M	None	Moved	13	Y	Y	N
Rail	CV-29-5	Culvert	S			29911	521552	7954118	1	24	900	5	N	NFB	N	NFB	M	2009 (1)	Moved	16	Y	Y	N
Rail	CV-30-1	Culvert	S			29989	521581	7954046	1	18	1200	5	N	NFB	N	NFB	M	2009 (1)	Moved	15	Y	Y	N
Rail	CV-30-1a	Culvert	S			30014	521590	7954022	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-30-2	Culvert	LP			30128	521624	7953914	1	24	900	5	N	NFB	N	NFB	M	-	Moved	48	Y	Y	N
Rail	CV-30-3	Culvert	LP			30361	521661	7953684	1	18	900	2	N	NFB	N	NFB	M	-	Moved	30	Y	Y	N
Rail	CV-30-4	Culvert	LP			30594	521686	7953452	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-30-5	Culvert	S			30711	521699	7953336	3	18	900	1	Y	MAR	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-30-6	Culvert	LP			30805	521709	7953242	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-30-7	Pond Infilling + Culvert	P			30899	521716	7953180	1	18	900	1	N	NFB	N	NFB	Y	2009 (1)	Moved	40	Y	Y	N
Rail	CV-31-1	Culvert	S			31247	521755	7952784	2	24	1500	3	Y	IMP	N	NFB	Y	2006 (1) 2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-31-2	Culvert	S			31277	521755	7952773	2	24	1800	1	Y	IMP	N	NFB	Y	2006 (1) 2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-31-3	Culvert	LP			31528	521760	7952522	2	18	900	4	N	NFB	N	NFB	N	-	Moved	93	N	N	Y
Rail	CV-31-4	Culvert	LP			31798	521781	7952253	1	24	900	5	N	NFB	N	NFB	M	-	Moved	40	Y	Y	Y
Rail	CV-32-1	Culvert	LP			31879	521798	7952174	1	24	900	5	N	NFB	N	NFB	M	-	Moved	7	Y	Y	Y
Rail	CV-32-2	Culvert	LP			32202	521882	7951862	1	18	900	5	N	NFB	N	NFB	M	-	Moved	7.2	Y	Y	Y
Rail	CV-32-3	Culvert	LP			32439	521943	7951633	1	18	900	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-32-4	Culvert	S			32641	521981	7951435	2	18	900	4	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-32-5	Culvert	LP			32687	521985	7951389	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-32-6	Culvert	LP			32969	521992	7951107	1	18	900	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-33-1	Culvert	LP			33066	521994	7951010	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-33-2	Culvert	S			33166	521995	7950910	1	18	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-33-4	Culvert	S			33362	521979	7950715	2	24	1500	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-33-5	Culvert	LP			33460	521962	7950618	2	18	1500	1	N	NFB	N	NFB	M	-	Moved	45	Y	Y	Y
Rail	CV-33-6	Culvert	S			33529	521950	7950550	2	18	900	1	Y	IMP	N	NFB	M	2009 (2) 2013-2017 (1 each)	Moved	20	Y	Y	N
Rail	CV-33-6a	Culvert	LP			33913	521884	7950172	3	12	1200	1	N	NFB	N	NFB	N	-	moved	42	N	N	Y
Rail	CV-33-8	Culvert	LP			34314	521815	7949777	1	18	1200	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-34-1	Culvert	S			34423	521797	7949670	1	24	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-34-1a	Culvert	LP			34537	521778	7949557	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-34-1b	Culvert	LP			34779	521776	7949316	1	12	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-34-2	Culvert	LP			34933	521793	7949163	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-35-2	Plate Arch Culvert	S			35289	521940	7948843	4	36	AIL - SUPER-COR Arch SCA1 Span = 6.990 m Rise = 3.495 m Area = 19.20 m^2	1	Y	IMP	N	NFB	Y	2008 (2) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-35-3	Culvert	LP			35830	522224	7948389	1	12	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-35-4	Culvert	LP			35934	522257	7948290	3	18	1500	1	N	NFB	N	NFB	M	-	Moved	14	Y	Y	N
Rail	CV-38-0	Culvert	LP			38146	522559	7946123	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-38-1	Culvert	S			38268	522582	7946004	1	18	900	5	N	NFB	N	NFB	M	-	Moved	15	Y	Y	N
Rail	CV-38-2	Culvert	S			38477	522653	7945807	1	24	900	5	N	NFB	N	NFB	M	2009 (1)	Moved	15	Y	Y	N
Rail	CV-38-3	Culvert	S			38934	522847	7945393	3	42	1800	5	N	NFB	N	NFB	Y	2008 (2) 2009 (2)	NC	-	-	Y	-
Rail	CV-39-1	Culvert	S			39483	523140	7944930	1	30	1200	5	N	NFB	N	NFB	M	2009 (1)	Moved	17	Y	Y	N
Rail	CV-40-1	Culvert	LP			40135	523154	7944299	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-40-2	Culvert	S			40274	523157	7944160	3	24	1500	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-40-4	Culvert	LP			40750	523294	7943706	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-41-1	Culvert	LP			41058	523333	7943400	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-41-2	Culvert	LP			41128	523341	7943331	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-41-4	Culvert	LP			41424	523360	7943036	1	24	1200	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-42-1	Culvert	S			42133	523424	7942334	3	24	900	2	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-42-1a	Culvert	S			42300	523436	7942167	1	18	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	Cv-42-1b	Culvert	LP			42550	523420	7941918	1	12	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-42-2	Culvert	LP			42869	523478	7941606	1	24	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-43-1	Culvert	S			43256	523653	7941261	3	24	900	3	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-43-3	Culvert	S			43450	523744	7941090	4	24	1500	1	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-43-5	Culvert	S			43664	523850	7940904	1	30	1500	3	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-43-6	Culvert	LP			43962	524015	7940656	1	12	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-44-1	Culvert	LP			44066	524072	7940569	1	12	900	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-44-2	Culvert	S			44251	524175	7940415	3	18	900	3	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-44-3	Culvert	S			44898	524513	7939864	3	24	900	4	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-45-0	Culvert	LP			45512	524818	7939331	1	12	900	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-46-2	Culvert	LP			46456	525290	7938517	3	12	900	1	N	NFB	N	NFB	M	-	Moved	23	Y	Y	N
Rail	CV-46-3	Culvert	S			46661	525376	7938332	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-46-4	Culvert	S			46754	525393	7938241	2	30	900	4	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-46-6	Culvert	S			46828	525404	7938168	1	24	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-47-1A	Culvert	S			46907	525415	7938089	1	24	900	3	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-47-1b	Culvert	S		CV-47-1c	47062	525454	7937939	1	18	1200	1	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-47-1c	Cut	LP	CV-47-1b		47303	525543	7937715	N/A	N/A	N/A	N/A	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-47-1	Plate Arch Culvert	S			47680	525683	7937366	2	24	AIL - SUPER-COR Arch SCA1 Span = 6.990 m Rise = 3.495 m Area = 19.20 m^2	1	Y	IMP	N	NFB	Y	2008 (1) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-47-2	Culvert	S			47722	525698	7937327	4	24	1800	2	Y	IMP	N	NFB	Y	2008 (1) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-47-3	Plate Arch Culvert	S			47787	525729	7937268	2	24	AIL - SUPER-COR Arch SCA1 Span = 6.990 m Rise = 3.495 m Area = 19.20 m^2	4	Y	MAR	N	NFB	Y	2008 (1) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-47-3a	Culvert	LP			47920	525810	7937163	1	24	900	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-48-2	Culvert	LP/S			48066	525916	7937063	1	30	900	5	N	NFB	N	NFB	Y	2013-2017 (1 each)	NC	-	-	Y	-

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-48-3	Culvert	S			48512	526325	7936887	1	18	900	4	N	NFB	N	NFB	M	2009 (2) 2010-2017 (1 each)	Moved	40	Y	Y	N
Rail	CV-48-4	Plate Arch Culvert	S			48665	526464	7936822	4	54	AIL - SUPER-COR Arch SCA1 Span = 6.990 m Rise = 3.495 m Area = 19.20 m^2	3	Y	IMP	N	NFB	M	2009 (2) 2010-2017 (1 each)	Moved	160	Y	Y	N
Rail	CV-49-0	Culvert	S			48907	526627	7936646	1	18	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-49-1	Culvert	LP			49121	526690	7936443	1	18	900	3	N	NFB	N	NFB	Y	N	Moved	> 100	N	N	Y
Rail	CV-49-2	Culvert	S			49464	526737	7936103	1	12	1200	5	P	MAR	P	MAR	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-49-3	Culvert	LP/S			49827	526786	7935744	1	24	1200	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-50-1	Culvert	LP			50134	526828	7935440	1	12	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-50-2	Culvert	LP			50405	526863	7935171	1	36	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-50-3a	Culvert	LP			50491	526868	7935085	1	36	900	2	N	NFB	N	NFB	M	-	New	-	Y	Y (cv-50-3)	N
Rail	CV-50-4	Culvert	LP			50712	526876	7934864	1	24	900	5	N	NFB	N	NFB	M	-	Moved	30	Y	Y	N
Rail	CV-50-5	Culvert	S			50952	526924	7934630	4	30	1800	5	Y	MAR	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-50-6	Culvert	S			50960	526926	7934622	3	30	1800	5	Y	IMP	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-51-1	Culvert	LP			51171	526982	7934419	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-51-1a	Culvert	LP			51860	527066	7933739	1	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-51-2	Culvert	LP			51933	527061	7933666	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-51-3	Culvert	LP			52202	527041	7933398	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-51-4	Culvert	LP			52277	527037	7933323	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-52-1	Culvert	S			52630	527089	7932975	1	12	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-52-1a	Culvert	LP			52770	527119	7932838	1	12	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-52-2	Culvert	LP			52840	527142	7932772	1	18	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-52-3	Culvert	LP			52917	527175	7932702	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-53-0	Culvert	LP			53136	527298	7932521	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-53-1	Culvert	LP			53231	527343	7932438	1	18	900	1	N	NFB	N	NFB	M	-	Moved	39	Y	Y	N
Rail	CV-53-1a	Culvert	LP			53335	527374	7932339	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-53-1b	Culvert	LP			53650	527338	7932030	1	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-53-1c	Culvert	S			53744	527304	7931942	1	24	900	2	N	NFB	N	NFB	M	-	Moved	10	Y	Y	N
Rail	CV-54-1	Culvert	S			54293	527320	7931407	2	18	1500	3	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-54-2	Culvert	S			54870	527529	7930869	2	18	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-55-1	Culvert	LP			55104	527580	7930641	3	24	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-55-2	Culvert	LP			55320	527619	7930429	1	18	1200	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-55-3	Culvert	S			55414	527636	7930336	3	24	1500	1	Y	IMP	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-56-1	Culvert	S			56501	528081	7929346	2	24	1500	1	Y	MAR	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-57-1	Culvert	S			57053	528308	7928844	2	18	1500	2	Y	IMP	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-57-2	Culvert	S			57218	528345	7928683	1	18	1200	2	Y	IMP	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-57-3	Culvert	S			57773	528287	7928135	1	12	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-58-1	Culvert	S			57949	528233	7927968	1	12	900	1	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-58-2	Culvert	S			58124	528157	7927810	1	12	900	3	P	MAR	P	MAR	Y	-	NC	-	-	Y	-

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-58-3	Culvert	S			58230	528100	7927721	1	18	900	3	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-58-4	Culvert	S			58315	528048	7927654	1	18	900	3	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-58-4a	Culvert	S			58498	527922	7927521	1	30	900	1	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-58-5	Culvert	S			58722	527751	7927378	2	36	1500	3	Y	IMP	P	MAR	Y	2016 (1)	NC	-	-	Y	-
Rail	CV-58-6	Culvert	S			58829	527668	7927309	1	54	1200	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-58-7	Culvert	S			58860	527650	7927282	1	48	1200	5	N	NFB	N	NFB	Y	None	NC	-	-	Y	-
Rail	CV-58-8	Culvert	S			58937	527590	7927234	1	36	900	5	N	NFB	N	NFB	M	-	Moved	34	Y	Y	N
Rail	CV-59-1	Culvert	S			58989	527556	7927195	1	42	900	3	N	NFB	N	NFB	M	-	Moved	50	Y	Y	N
Rail	CV-59-2	Culvert	S			59129	527470	7927085	1	18	900	5	N	NFB	N	NFB	N	-	Moved	100	N	N	Y
Rail	CV-59-3	Culvert	S			59227	527357	7926927	3	30	1500	5	N	NFB	N	NFB	N	-	Moved	179	N	N	Y
Rail	CV-59-4	Culvert	S			59477	527294	7926787	3	30	1500	5	P	MAR	N	NFB	N	-	Moved	125	N	N	Y
Rail	CV-59-4a	Culvert	S			59674	527254	7926594	3	30	1200	5	N	NFB	N	NFB	M	-	Moved	80	Y	Y	N
Rail	CV-59-5	Culvert	S			59790	527233	7926480	3	30	1200	5	N	NFB	N	NFB	M	-	Moved	53	Y	Y	N
Rail	CV-60-1	Culvert	S			60012	527201	7926261	1	36	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-60-2	Pond Infilling + Stream Crossing	S/P			60185	527212	7926088	1	36	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-60-3	Culvert	S			60319	527225	7925955	1	48	900	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-60-4	Culvert	S			60486	527229	7925788	1	30	900	5	P	MAR	P	MAR	M	-	Moved	18	Y	Y	N
Rail	CV-60-5	Culvert	S			60810	527136	7925480	1	30	1200	2	N	NFB	N	NFB	N	-	Moved	150	N	N	Y
Rail	CV-60-6a	Culvert	LP			60930	527088	7925370	1	18	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-61-1	Culvert	S			61050	527041	7925260	2	18	900	3	N	NFB	N	NFB	N	-	Moved	268	N	N	Y
Rail	CV-61-2	Culvert	S			61197	526983	7925125	2	18	900	5	P	MAR	P	MAR	N	-	Moved	244	N	N	Y
Rail	CV-61-3a	Culvert	LP			61437	526926	7924893	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-61-4	Culvert	LP			61579	526921	7924751	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-62-1	Plate Arch Culvert	S			61888	526833	7924457	4	96	AIL - SUPER-COR Arch SCA55 Span = 16.050 m Rise = 8.025 m Area = 101.1 m^2	3	Y	IMP	N	NFB	M	-	Moved	36	Y	Y	N
Rail	CV-62-2	Culvert	S			62278	526801	7924075	1	18	900	4	P	NFB	P	NFB	N	-	Moved	127	N	N	Y
Rail	CV-62-2a	Culvert	S			62334	526810	7924019	1	24	900	5	P	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-62-3a	Culvert	LP			62800	526878	7923558	1	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-62-6	Culvert	S			63009	526908	7923352	2	12	900	5	N	NFB	N	NFB	N	-	Moved	118	N	N	Y
Rail	CV-63-1	Culvert	S			63249	526947	7923115	1	36	900	5	N	NFB	N	NFB	N	-	Moved	137	N	N	Y
Rail	CV-63-2	Culvert	S			63290	526957	7923075	3	24	900	3	N	NFB	N	NFB	N	-	Moved	154	N	N	Y
Rail	CV-63-4	Culvert	S			63724	527125	7922676	1	36	1200	5	N	NFB	N	NFB	M	-	Moved	85	Y	Y	N
Rail	CV-63-4a	Culvert	S			63801	527158	7922606	1	36	900	5	P	MAR	P	MAR	M	-	Moved	75	Y	Y	N
Rail	CV-63-4b	Culvert	LP			63833	527173	7922578	1	36	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-64-1a	Culvert	LP			63933	527216	7922488	1	30	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-64-3	Culvert	S			64275	527365	7922180	1	30	1200	5	N	NFB	N	NFB	N	-	Moved	139	N	N	Y
Rail	CV-64-3a	Culvert	LP			64394	527417	7922073	1	24	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-64-4	Culvert	S			64662	527534	7921831	1	18	1200	3	N	NFB	N	NFB	N	-	Moved	182	N	N	Y
Rail	CV-64-6	Culvert	S			64817	527601	7921692	1	12	900	5	N	NFB	N	NFB	N	-	Moved	187	N	N	Y
Rail	CV-64-7	Culvert	LP			64924	527648	7921596	1	18	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-64-8	Culvert	LP			65037	527697	7921494	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-65-1	Culvert	S			65158	527746	7921383	1	48	1200	5	N	NFB	N	NFB	M	-	Moved	57	Y	Y	N
Rail	CV-65-2a	Culvert	LP			65449	527824	7921103	1	36	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-65-2b	Culvert	S			65594	527863	7920964	1	42	900	5	N	NFB	N	NFB	N	-	Moved	47	N	N	Y
Rail	CV-66-1	Culvert	S			65854	527990	7920738	1	48	900	5	P	MAR	P	MAR	N	-	Moved	132	N	N	Y
Rail	CV-66-1a	Culvert	LP			65893	528013	7920706	1	36	1200	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-66-1b	Culvert	LP			65953	528047	7920657	1	30	1200	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-66-2	Culvert	LP/S			66113	528140	7920526	1	30	1200	3	P	MAR	P	MAR	N	-	Moved	126	N	N	Y
Rail	CV-66-3	Culvert	S			66362	528277	7920319	1	30	900	5	N	NFB	N	NFB	M	-	Moved	62	Y	Y	N
Rail	CV-66-4a	Culvert	LP			66386	528287	7920297	1	30	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-66-5	Culvert	S			66568	528342	7920124	1	18	900	5	P	MAR	P	MAR	M	-	Moved	87	Y	Y	N
Rail	CV-66-8	Culvert	S			66698	528353	7919995	1	24	900	5	P	MAR	P	MAR	M	-	Moved	29	Y	Y	N
Rail	CV-67-1a	Culvert	LP/S			67429	528293	7919266	1	18	900	5	P	MAR	P	MAR	N	-	New	-	-	-	Y

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-67-1b	Culvert	LP/S			67523	528285	7919173	1	18	900	5	P	MAR	P	MAR	N	-	New	-	-	-	Y
Rail	CV-67-1c	Culvert	LP			67645	528275	7919051	1	30	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-67-1	Culvert	S			66940	528335	7919753	1	42	1200	5	N	NFB	N	NFB	M	-	Moved	41	Y	Y	N
Rail	CV-67-2	Culvert	S			67712	528268	7918984	1	36	900	5	N	NFB	N	NFB	M	-	Moved	-43	Y	Y	N
Rail	CV-68-1a	Culvert	S			67786	528254	7918912	5	60	1800	5	Y	IMP	N	NFB	M	-	Moved	75	Y	Y	N
Rail	CV-68-1	Culvert	S			67853	528236	7918847	3	60	1800	5	Y	IMP	N	NFB	M	-	Moved	42	Y	Y	N
Rail	CV-68-3	Culvert	S			68193	528162	7918517	2	54	1200	3	Y	MAR	N	NFB	N	-	Moved	106	N	N	Y
Rail	CV-68-5	Culvert	S			68345	528174	7918366	1	54	1200	5	P	MAR	P	MAR	N	-	Moved	103	N	N	Y
Rail	CV-68-6	Culvert	LP/S			68656	528265	7918068	1	24	900	5	P	MAR	P	MAR	N	-	New	-	-	-	Y
Rail	CV-69-1	Culvert	LP			68879	528333	7917856	1	18	900	4	N	NFB	N	NFB	M	-	Moved	28	Y	Y	N
Rail	CV-69-2	Culvert	S			69240	528445	7917513	3	42	900	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-69-3	Culvert	S			69290	528460	7917465	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-69-4	Culvert	S			69343	528477	7917415	1	18	900	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-69-5	Culvert	LP			69600	528560	7917172	1	12	900	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-70-1	Pond Infilling + Culvert	P			69850	528701	7916967	1	12	900	1	N	NFB	N	NFB	M	-	Moved	49	Y	Y	N
Rail	CV-70-2	Culvert	S			70247	529029	7916746	3	18	900	1	Y	MAR	Y	MAR	Y	-	NC	-	-	Y	-
Rail	CV-70-3	Bridge	S			70352	529120	7916693	N/A	N/A	N/A	N/A	Y	IMP	Y	MAR	Y	2008 (2) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-71-1	Pond Infilling + Culvert	P			70713	529449	7916551	3	18	1500	1	Y	IMP	P	MAR	M	-	Moved	21	Y	Y	N
Rail	CV-71-2a	Pond Infilling + Culvert	P			70972	529708	7916558	1	18	900	5	N	NFB	N	NFB	M	-	Moved	15	Y	Y	N
Rail	CV-72-1	Culvert	S			71748	530378	7916952	1	24	900	2	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-72-1a	Culvert	S			71966	530586	7917015	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-72-2	Culvert	S			72169	530782	7917069	1	12	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-72-3	Culvert	S			72448	531051	7917143	1	18	900	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-72-3a	Culvert	S			72530	531130	7917165	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-72-4	Culvert	S			72559	531158	7917172	1	24	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-73-1a	Culvert	LP			73795	531961	7918002	1	12	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-73-2	Culvert	S			73845	531986	7918045	1	18	900	1	N	NFB	N	NFB	M	-	Moved	18	Y	Y	N
Rail	CV-73-3	Culvert	S			74083	532159	7918206	1	18	900	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-73-4	Culvert	S			74233	532298	7918260	1	24	900	1	N	NFB	N	NFB	M	-	Moved	22	Y	Y	N
Rail	CV-74-1	Culvert	S			74301	532365	7918273	4	24	1800	1	P	IMP	N	NFB	M	-	Moved	23	Y	Y	N
Rail	CV-74-3	Culvert	LP			74704	532742	7918407	1	36	900	4	N	NFB	N	NFB	M	-	Moved	42	Y	Y	N
Rail	CV-74-4	Culvert	LP			74873	532892	7918484	1	30	900	3	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-74-6	Culvert	S			74952	532966	7918511	1	30	900	5	P	MAR	P	MAR	M	-	Moved	48	Y	Y	N
Rail	CV-74-7	Culvert	S			75212	533223	7918537	1	18	900	5	N	NFB	N	NFB	M	-	Moved	62	Y	Y	N
Rail	CV-75-1	Culvert	S			75390	533400	7918514	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-75-1a	Culvert	S			75437	533446	7918508	3	24	1200	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-75-2	Culvert	S			75549	533559	7918501	1	24	600	5	P	MAR	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-76-1	Culvert	S			75889	533896	7918535	2	30	1200	4	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-76-1a	Culvert	LP			76329	534334	7918576	1	30	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-76-2	Culvert	LP			76501	534506	7918563	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-76-3	Culvert	LP			76824	534825	7918512	1	30	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-77-1	Culvert	LP			76987	534986	7918490	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-77-2	Plate Arch Culvert	S			77275	535272	7918513	2	60	AIL - SUPER-COR Arch SCA1 Span = 6.990 m Rise = 3.495 m Area = 19.20 m^2	4	Y	IMP	P	NFB	M	-	Moved	49	Y	Y	N
Rail	CV-77-2a	Culvert	LP			77410	535407	7918512	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-77-3	Culvert	S			77495	535492	7918507	1	18	900	5	N	NFB	N	NFB	M	-	Moved	-16	Y	Y	N
Rail	CV-78-1	Culvert	LP			77701	535698	7918502	1	18	900	5	N	NFB	N	NFB	M	-	Moved	10	Y	Y	N
Rail	CV-78-2	Culvert	LP			77888	535880	7918541	1	24	900	5	N	NFB	N	NFB	M	-	Moved	30	Y	Y	N

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-78-3	Culvert	S			78032	536010	7918603	2	48	1200	5	P	MAR	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-78-5	Culvert	LP			78267	536205	7918735	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-78-6	Culvert	S			78538	536443	7918863	1	12	900	4	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-78-7	Culvert	LP/S			78995	536860	7919050	1	18	1200	2	P	MAR	P	MAR	N	-	New	-	-	-	Y
Rail	CV-79-0	Culvert	S			79388	537242	7919138	1	18	1200	2	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-80-1	Culvert	S			79600	537452	7919170	2	30	1800	1	Y	MAR	P	MAR	M	-	moved	-17	Y	Y	N
Rail	CV-80-1a	Culvert	LP			79627	537479	7919171	1	30	900	2	N	NFB	N	NFB	M	-	moved	-14	Y	Y	N
Rail	CV-80-1b	Culvert	LP			80240	538055	7919336	1	18	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-80-2	Culvert	S			80590	538320	7919564	1	24	1200	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-80-2a	Culvert	S			80575	538308	7919555	1	24	1200	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-80-2b	Culvert	S			80606	538334	7919572	1	24	1200	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-80-3	Culvert	S			80747	538455	7919644	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-80-4	Culvert	S			80808	538508	7919674	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-80-5	Culvert	LP			80914	538600	7919727	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-81-1	Culvert	S			81016	538687	7919780	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-81-2	Culvert	S			81247	538867	7919924	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-81-3	Culvert	S			81357	538942	7920005	1	24	900	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-81-4	Culvert	S			81574	539077	7920175	1	18	900	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-82-1	Culvert	S		~~CV-82-1a~~	81664	539132	7920246	2	18	1200	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-82-2	Culvert	S			82009	539375	7920489	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-82-3	Culvert	LP			82172	539501	7920593	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-82-4	Culvert	LP			82470	539730	7920784	1	24	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-83-1	Culvert	S			82590	539822	7920861	1	18	1200	1	Y	MAR	P	MAR	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-83-1a	Culvert	S			82674	539887	7920914	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-83-2	Culvert	S			83036	540172	7921136	2	18	1800	2	Y	MAR	Y	IMP	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-84-1	Plate Arch Culvert	S			83799	540830	7921521	2	24	RECOMMENDED SUPER COR Arch SCA16S Span = 4.26 m Rise = 2.1m	1	Y	IMP	Y	IMP	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-84-2	Culvert	S			84008	540966	7921678	1	18	900	1	N	NFB	N	NFB	M	2009 (2) 2010-2017 (1 each)	Moved	90	Y	Y	N
Rail	CV-84-3	Culvert	S			84476	541202	7922083	1	18	900	1	P	MAR	P	MAR	N	2009 (1) 2013 (1)	Moved	176	N	N	Y
Rail	CV-85-1	Culvert	S			84838	541455	7922333	1	18	900	1	N	NFB	N	NFB	N	2009 (1)	Moved	299	N	N	Y
Rail	CV-85-2	Culvert	S			85167	541774	7922382	1	18	1200	2	P	NFB	P	MAR	N	2009 (1)	Moved	212	N	N	Y
Rail	CV-85-2a	Culvert	LP			85427	542014	7922288	1	12	900	1	N	NFB	N	NFB	N	None	New	-	-	-	Y
Rail	CV-85-4	Bridge	S			85645	542168	7922134	N/A	N/A	N/A	N/A	Y	IMP	Y	IMP	N	2006 (1) 2009 (2) 2010-2017 (1 each)	Moved	131	N	N	Y
Rail	CV-86-1	Pond Infilling + Culvert	P			86273	542660	7921758	1	12	900	5	N	NFB	N	NFB	M	-	Moved	24	Y	Y	N
Rail	CV-86-2	Plate Arch Culvert	S			86378	542768	7921695	6	24	AIL - SUPER-COR Arch SCA1 Span = 6.990 m Rise = 3.495 m Area = 19.20 m^2	1	Y	MAR	Y	IMP	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-87-1	Culvert	LP			86806	543100	7921457	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-87-2	Culvert	LP			87158	543388	7921255	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-87-3	Culvert	LP			87328	543544	7921189	1	12	900	1	N	NFB	N	NFB	M	-	Moved	25	Y	Y	N
Rail	CV-87-4	Culvert	S			87510	543724	7921163	1	18	900	3	Y	MAR	Y	IMP	M	2009 (1) 2010 (1)	Moved	25	Y	Y	N

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

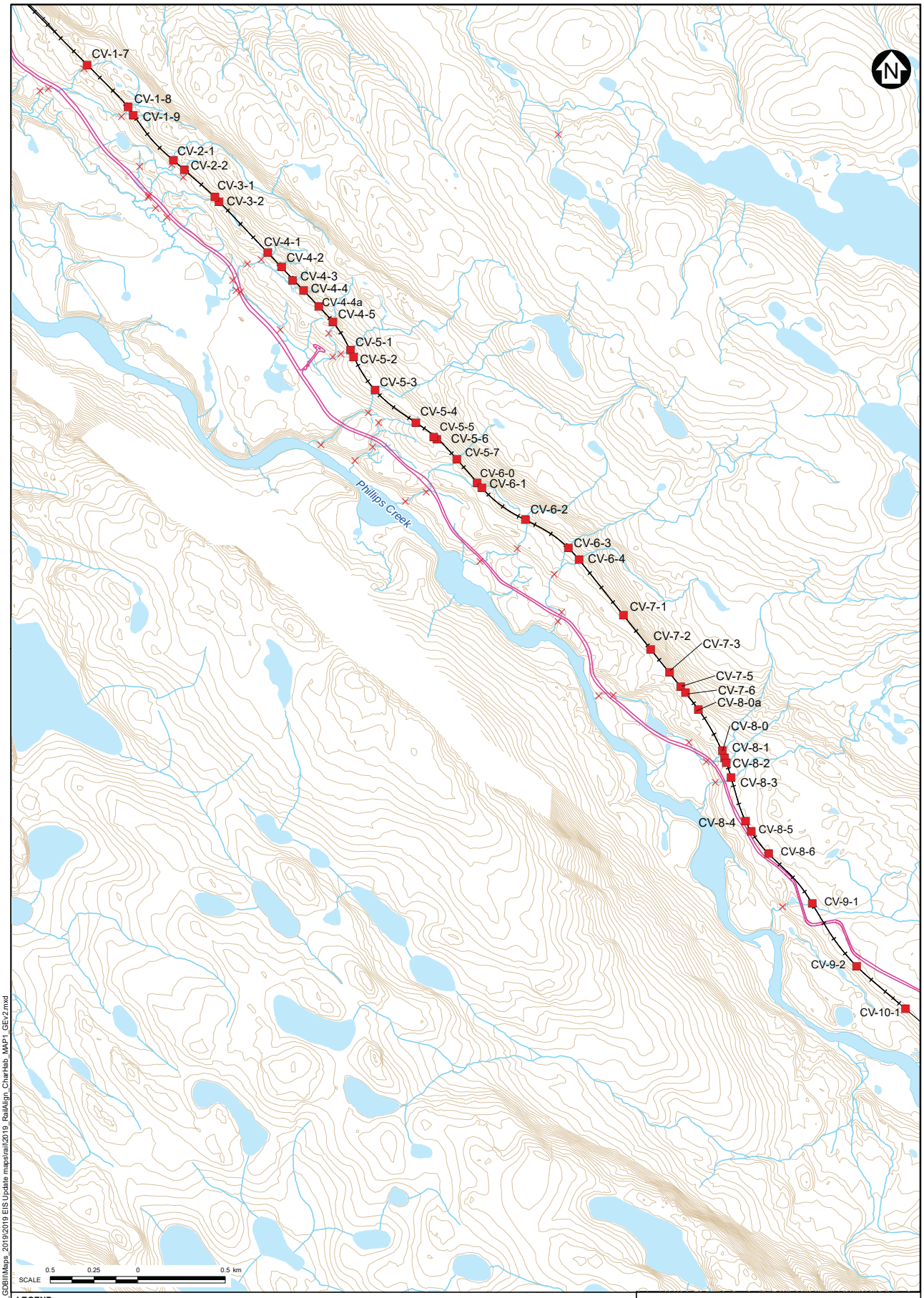
Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-88-1	Culvert	LP			87752	543962	7921199	1	12	900		N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-88-2	Culvert	S			88013	544209	7921282	1	24	900	1	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-88-3	Culvert	S			88072	544266	7921298	1	24	900	4	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Rail	CV-88-3a	Culvert	LP			88327	544517	7921339	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-88-3b	Culvert	LP			88510	544700	7921334	1	18	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-88-4	Culvert	LP			88970	545151	7921245	1	12	900	2	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-89-1	Culvert	S			89317	545490	7921173	4	30	1500	1	Y	IMP	Y	IMP	Y	2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-89-2	Pond Infilling + Culvert	P			89936	546017	7920881	4	24	1500	5	N	NFB	N	NFB	M	-	Moved	16	Y	Y	N
Rail	CV-90-1a	Culvert	LP/S			89941	546017	7920881	4	24	1500	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-90-2	Culvert	S			90441	546186	7920410	1	12	900	5	N	NFB	N	NFB	Y	2017 (1)	NC	-	-	Y	-
Rail	CV-90-3	Culvert	S			90659	546285	7920217	1	24	900	5	N	NFB	N	NFB	M	2017 (1)	Moved	50	Y	Y	N
Rail	CV-90-4	Culvert	S			90903	546460	7920049	1	12	900	1	N	NFB	N	NFB	Y	2017 (1)	NC	-	-	Y	-
Rail	CV-91-0	Culvert	S			91353	546864	7919850	1	18	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-91-1	Culvert	S			91424	546928	7919820	1	18	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-91-2	Culvert	S			91516	547011	7919781	1	18	900	2	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-92-1b	Culvert	LP			91644	547126	7919723	1	12	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-92-1	Pond Encroachment + Culvert	P			91699	547173	7919694	1	12	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-92-2	Culvert	LP			92002	547412	7919508	1	12	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-92-3	Culvert	S			92105	547501	7919457	1	24	900	5	N	NFB	N	NFB	M	2009 (1)	Moved	21	Y	Y	N
Rail	CV-92-4	Culvert	LP			92338	547706	7919347	1	30	1500	5	N	NFB	N	NFB	M	-	Moved	24	Y	Y	N
Rail	CV-92-5	Culvert	S			92529	547876	7919260	1	24	1500	4	Y	IMP	N	NFB	M	2009 (2) 2010-2017 (1 each)	Moved	25	Y	Y	N
Rail	CV-92-7	Culvert	S			92658	547999	7919222	1	18	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-92-9	Culvert	S			92720	548060	7919211	1	12	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-93-1	Culvert	LP			92840	548179	7919194	1	18	900	5	N	NFB	N	NFB	N	2009 (1)	Moved	49	N	N	Y
Rail	CV-93-3	Culvert	LP			93430	548631	7918844	1	30	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-93-3a	Culvert	S			93510	548689	7918789	1	36	900	2	N	NFB	N	NFB	M	2009 (1)	Moved	34	Y	Y	N
Rail	CV-93-4a	Culvert	S			93606	548767	7918733	3	36	1800	5	Y	MAR	N	NFB	M	2008 (2) 2009 (2) 2010-2017 (1 each)	Moved	43	Y	Y	N
Rail	CV-93-4	Culvert	S			93566	548733	7918755	1	36	1200	5	Y	IMP	N	NFB	M	2008 (2) 2009 (2) 2010-2017 (1 each)	Moved	52	Y	Y	N
Rail	CV-94-2	Culvert	S			94753	549840	7918392	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-95-1a	Culvert	LP			95112	550106	7918153	1	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-95-2	Culvert	S			95167	550143	7918112	1	24	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-95-3	Culvert	S			95781	550497	7917613	1	36	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-95-4	Culvert	S			95966	550630	7917484	1	36	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-95-4a	Culvert	LP			96024	550676	7917449	1	24	1200	4	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-95-5	Culvert	LP			96063	550707	7917426	2	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-95-5a	Culvert	S			96155	550781	7917371	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-95-6	Culvert	S			96217	550831	7917334	1	18	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-95-7	Culvert	LP			96285	550885	7917293	1	18	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-96-1	Culvert	S			96334	550925	7917264	4	36	1800	1	Y	IMP	Y	IMP	Y	2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Rail	CV-96-2	Culvert	S			96390	550970	7917230	1	24	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-97-1	Culvert	S			96672	551173	7917036	1	24	900	5	N	NFB	N	NFB	N	-	Moved	28	N	N	Y
Rail	CV-97-2	Culvert	S			96747	551221	7916979	1	18	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-97-3	Culvert	S			96793	551251	7916943	1	30	900	1	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-

TABLE A2-1. LIST OF NORTH RAIL INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Rail	CV-97-4	Culvert	S		CV-97-5 and CV-97-5b	96853	551291	7916898	1	18	900	5	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-97-5	Cut	S	CV-97-4		97018	551410	7916785	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-97-5b	Cut	S	CV-97-4		96900	551323	7916865	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-97-6	Cut	S	CV-97-7		97074	551457	7916754	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1)	NC	-	-	Y	-
Rail	CV-97-7	Culvert	S		CV-97-6	97206	551550	7916660	1	24	900	1	N	NFB	N	NFB	M	2009 (1)	Moved	24	Y	Y	N
Rail	CV-97-9	Culvert	S			97283	551608	7916609	1	18	900	2	N	NFB	N	NFB	M	2009 (1)	Moved	24	Y	Y	N
Rail	CV-97-10	Culvert	S			97505	551773	7916461	1	24	900	5	N	NFB	N	NFB	M	2009 (1)	Moved	17	Y	Y	N
Rail	CV-97-12	Culvert	LP			97655	551885	7916361	1	18	900	5	N	NFB	N	NFB	M	-	Moved	11	Y	Y	N
Rail	CV-98-0	Culvert	LP			97800	551993	7916264	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-99-1	Pond Infilling + Culvert	P			98379	552464	7915929	1	12	900	4	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-99-1a	Culvert	LP			98852	552811	7915609	1	18	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-99-2	Culvert	LP/S			99008	552944	7915529	1	18	900	1	N	NFB	N	NFB	M	-	Moved	33	Y	Y	N
Rail	CV-99-3	Culvert	S			99342	553257	7915413	4	24	1800	1	Y	IMP	Y	IMP	Y	2009 (2) 2011-2017 (1 each)	NC	-	-	Y	-
Rail	CV-100-1	Culvert	LP			99671	553573	7915323	1	12	900	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-100-2	Culvert	LP			99990	553890	7915325	1	12	900	1	N	NFB	N	NFB	Y	-	Moved	20	Y	Y	N
Rail	CV-100-3	Culvert	LP			100156	554047	7915378	1	12	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Rail	CV-100-4	Culvert	S			100303	554184	7915429	2	18	900	1	N	NFB	N	NFB	M	2009 (1) 2013-2017 (1 each)	Moved	22	Y	Y	N
Rail	CV-101-1	Culvert	S		CV-101-1a and CV-101-1b	100794	554672	7915456	1	12	1200	1	N	NFB	N	NFB	Y	2009 (1) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-101-1a	Cut	S	CV-101-1		100893	554772	7915455	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-101-1b	Cut	S	CV-101-1		101005	554883	7915453	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	2009 (1) 2013-2017 (1 each)	NC	-	-	Y	-
Rail	CV-101-1c	Culvert	LP			101302	555180	7915449	1	12	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Rail	CV-101-2	Culvert	S			101340	555218	7915448	1	12	900	4	N	NFB	N	NFB	M	2009 (1)	Moved	10	Y	Y	N
Rail	CV-102-1	Bridge	S			101852	555730	7915442	N/A	N/A	N/A	N/A	Y	IMP	N	NFB	Y	2006 (1) 2007 (3) 2008 (2) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-

N/A = not applicable; L = lake; LP = low point; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important; M = Moved; NC = No Change.

[1] M = moved but still in field survey area



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

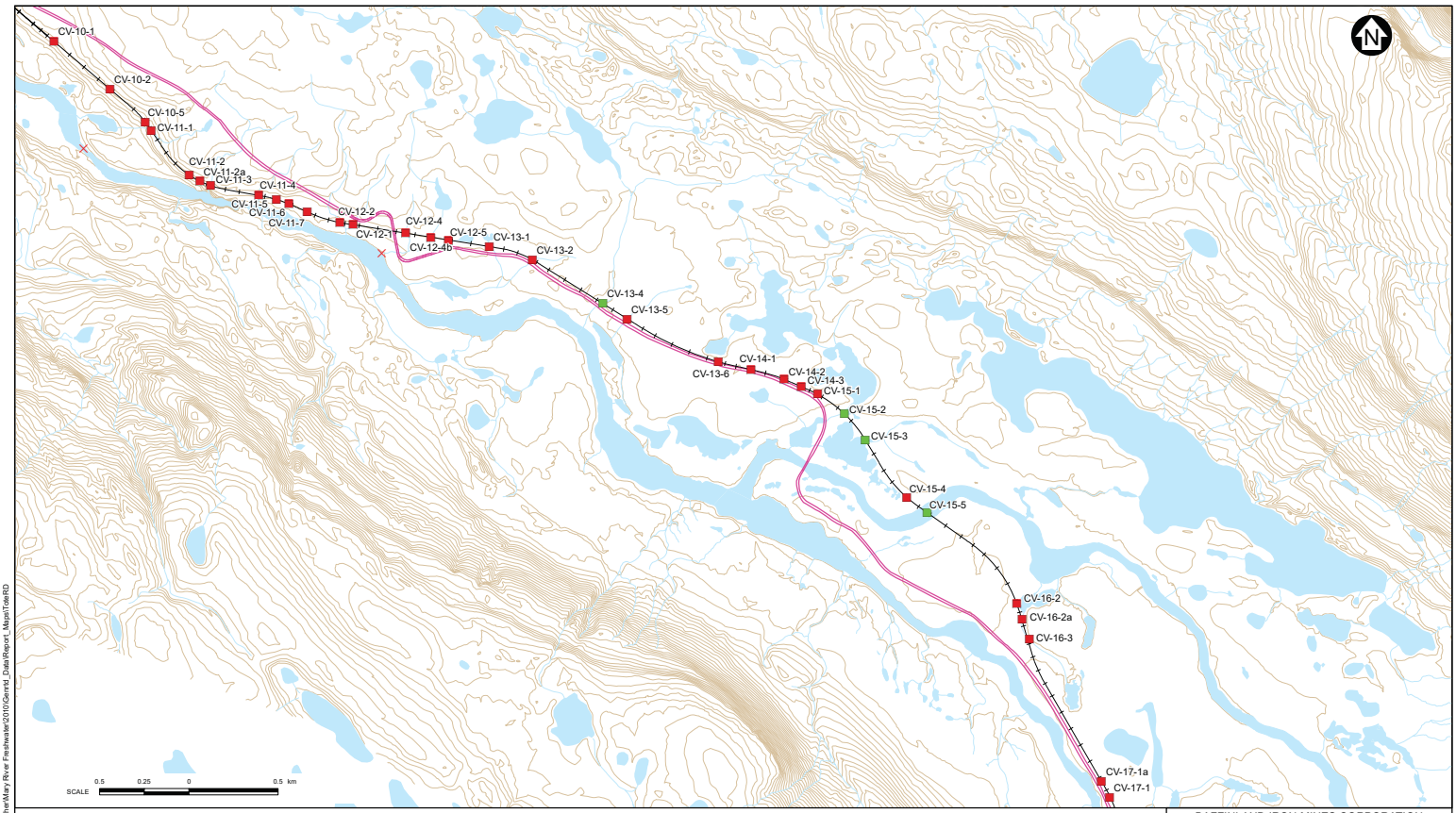
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 1 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 30/04/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\rail\2019_RailAlign_CharHab_MAP1_GEv2.mxd



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

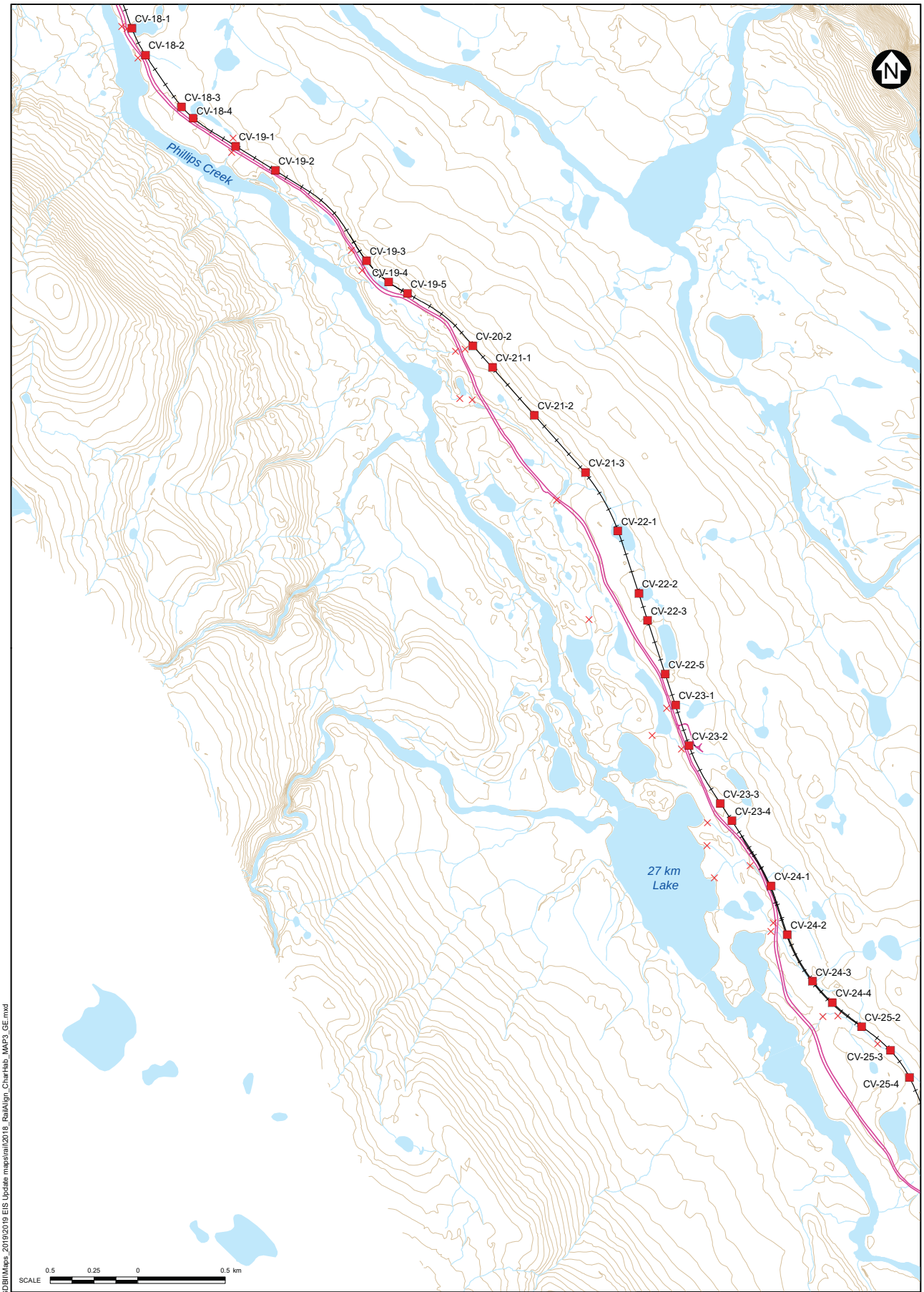
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 2 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.: -
REF NO.: -
DATE: 30/04/2019
REV: -

Path: \\terastation\GIS\Projects\Ohve\Mary River Freshwater\2010\Gen\rd_Data\Report_Maps\TotteRD



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

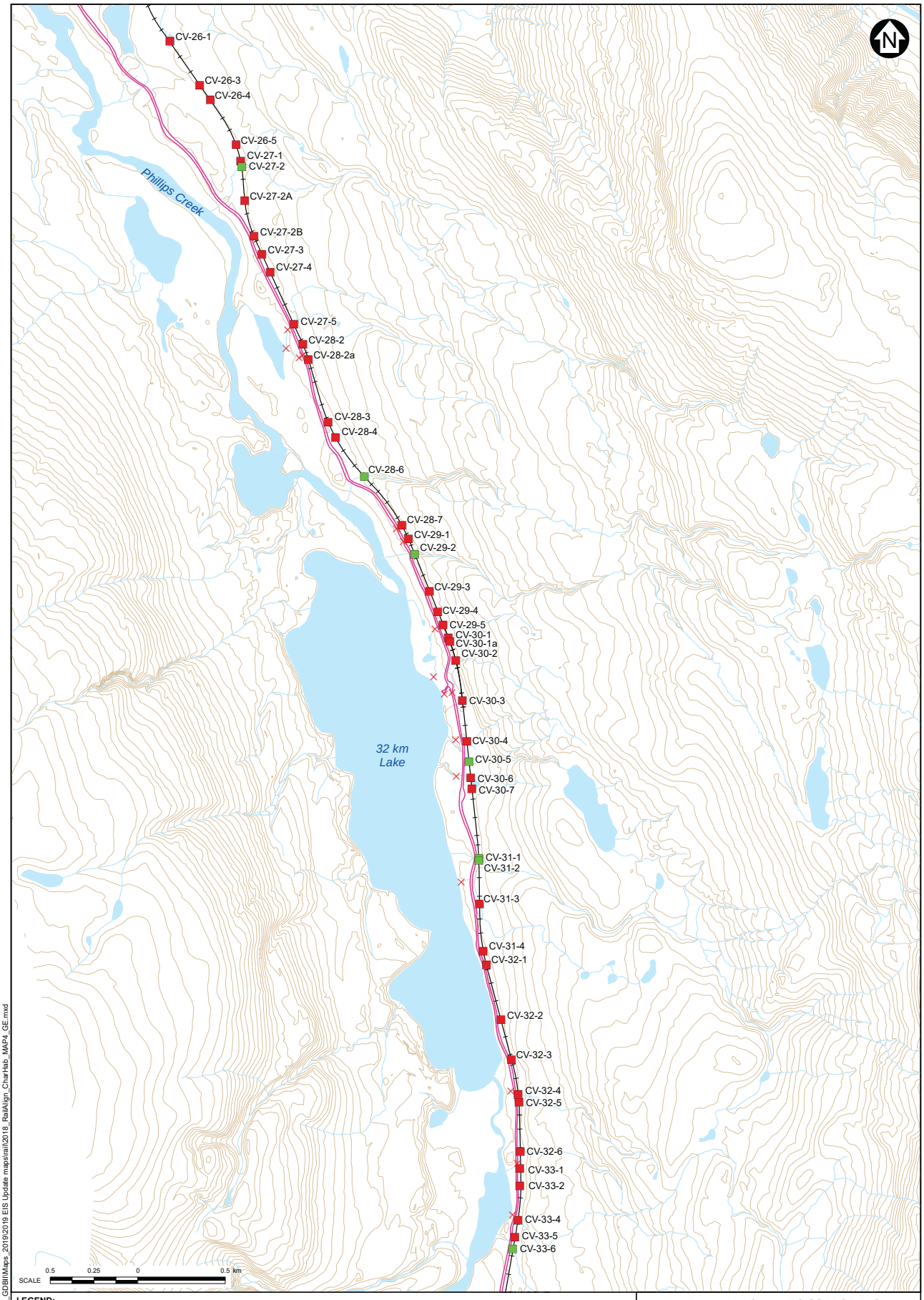
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 3 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 02/11/2018	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\rail\2018_RailAlign_CharHab_MAP3_GE.mxd



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 4 OF 12)

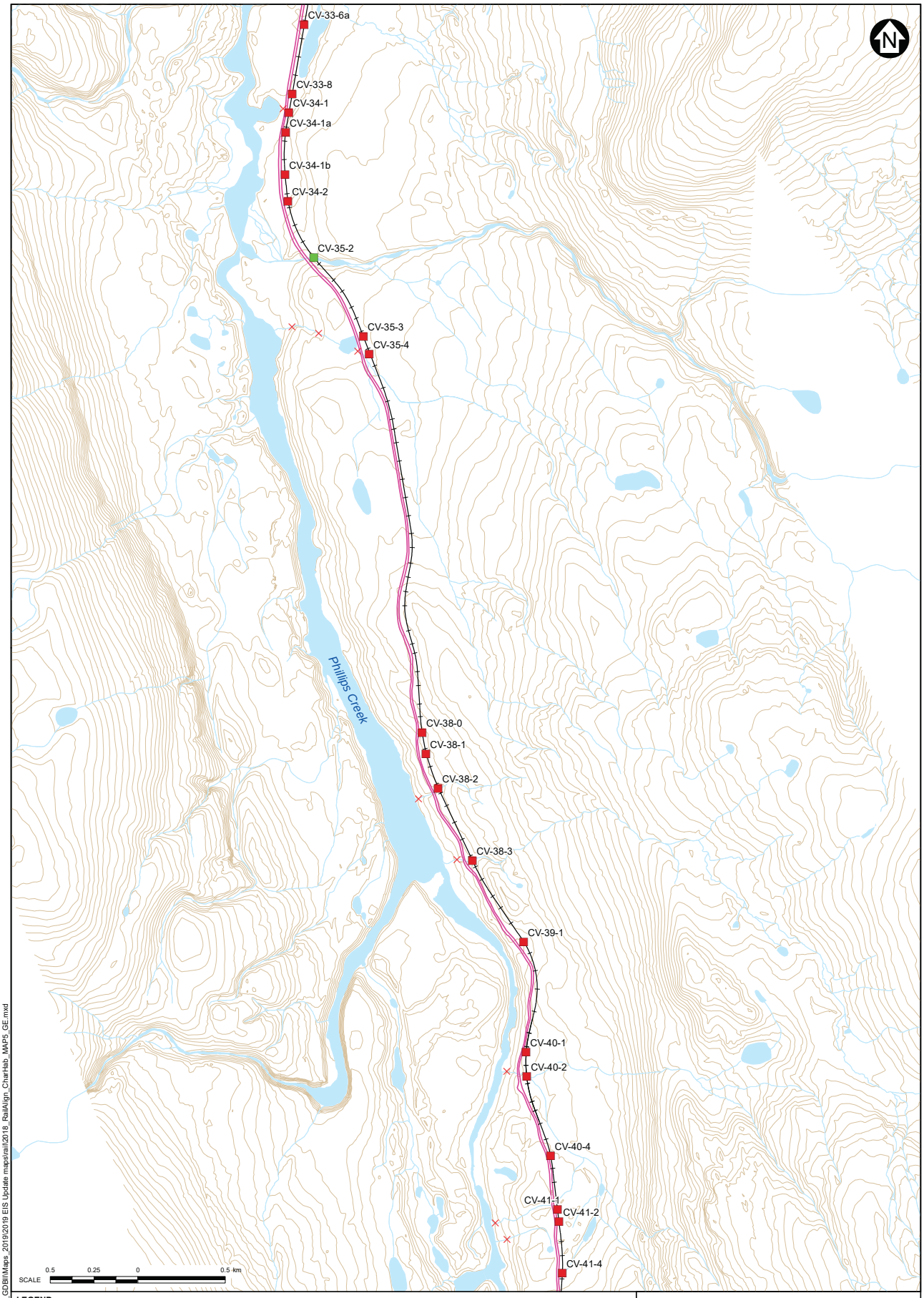
North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 30/04/2019

REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\rail\2018_RailAlign_CharHab_MAP4_GE.mxd



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

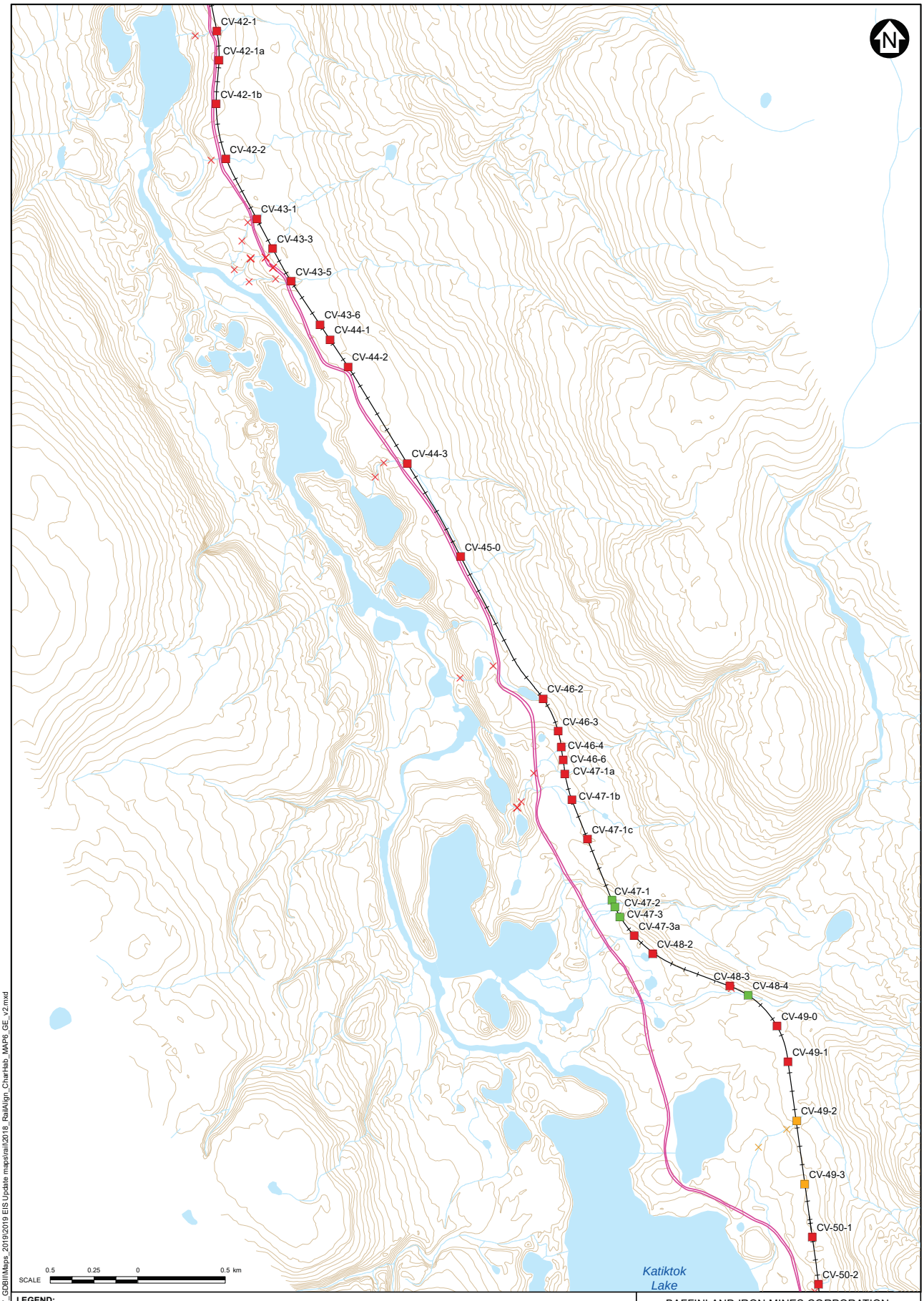
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 5 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 30/04/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\rail\2018_RailAlign_CharHab_MAP5_GE.mxd



LEGEND:

ARCTIC CHAR HABITAT
- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

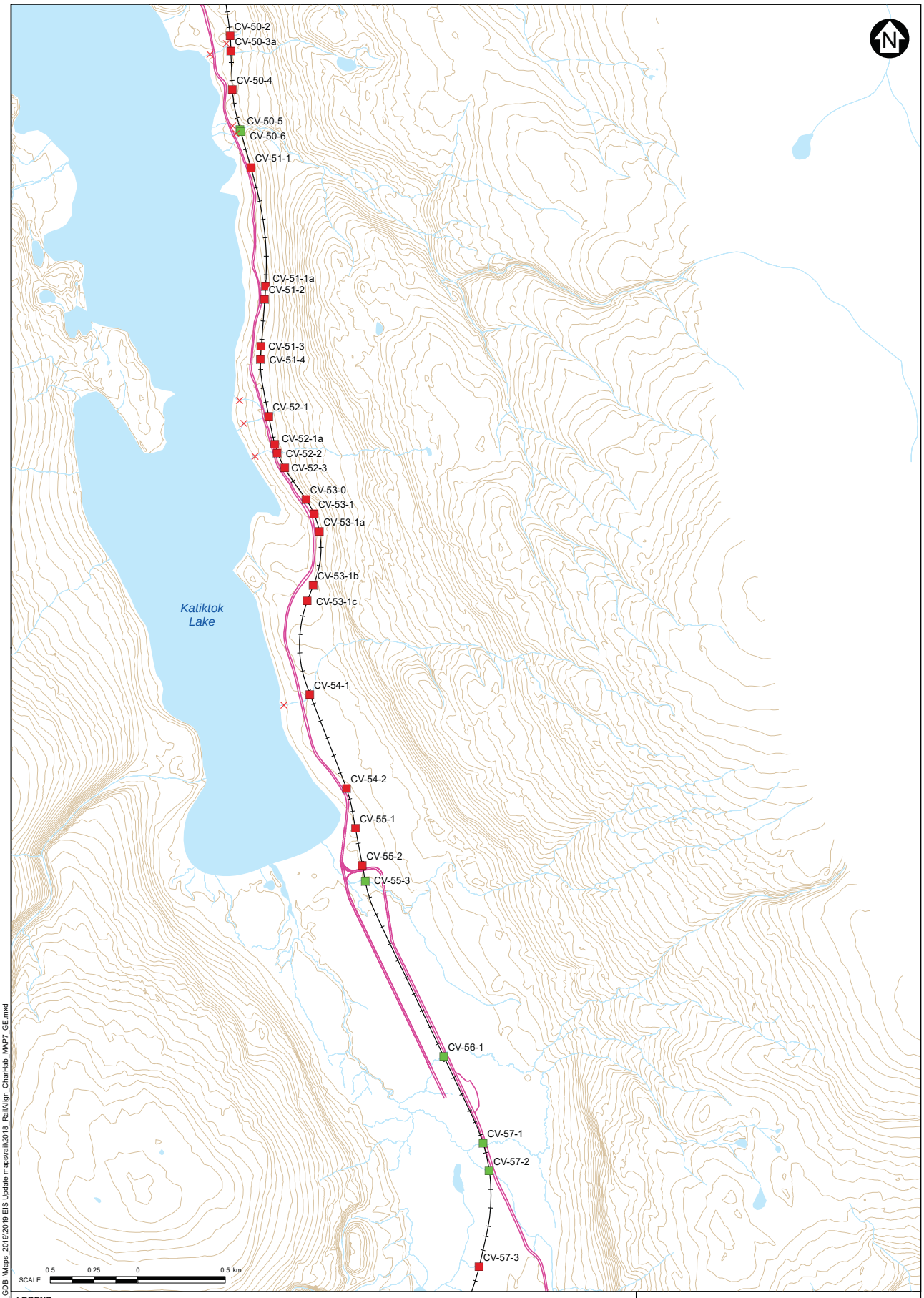
CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 6 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 30/04/2019 | REV 1

Document Path: J:\MYP\MARYRIV_GDB\II\Maps_2019\2019 EIS Update maps\rail\2018_RailAlign_CharHab_MAP6_GE_v2.mxd



Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\rail\2018_RailAlign_CharHab_MAP7_GE.mxd

LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

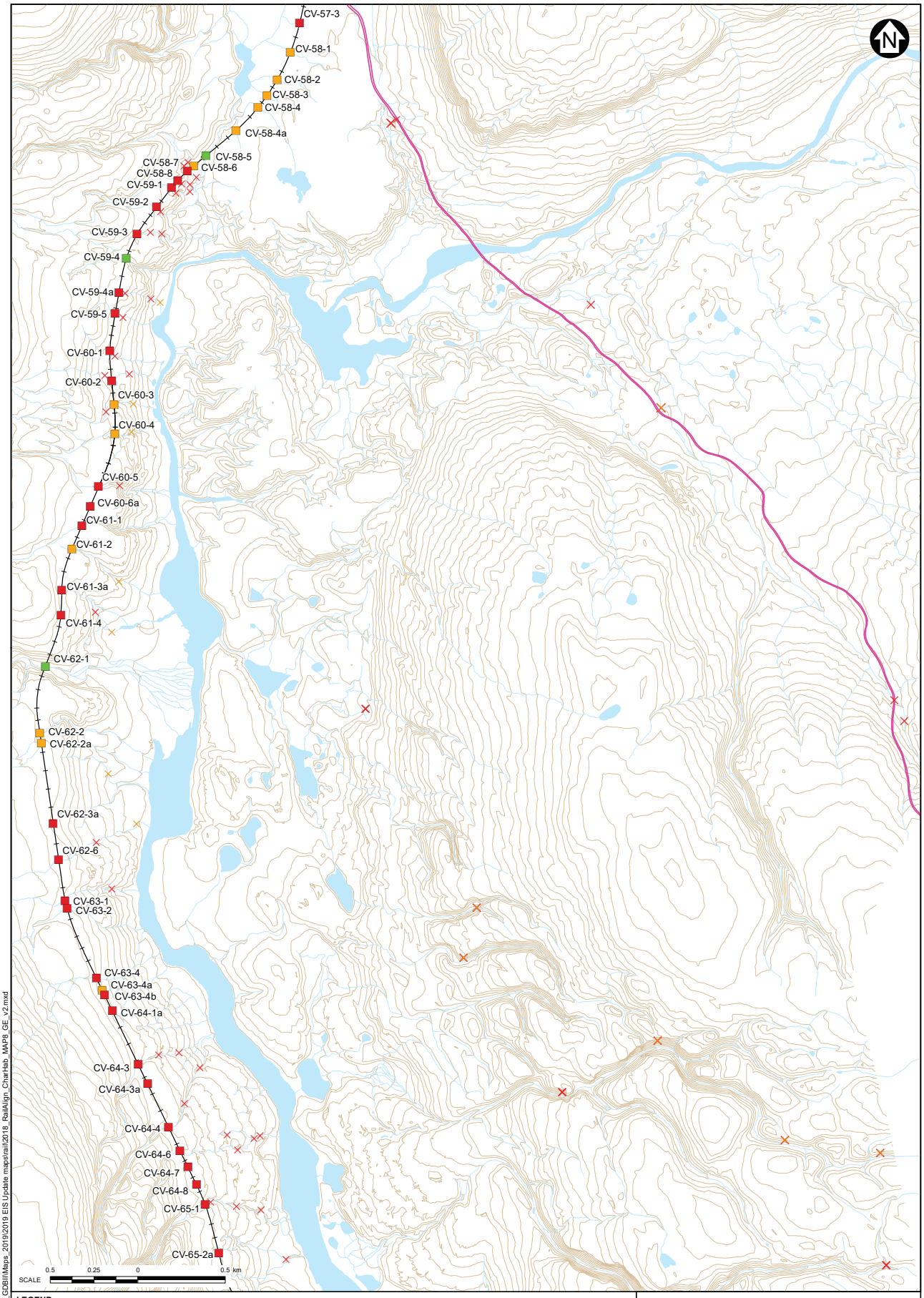
CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 7 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 30/04/2019

REV 1



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

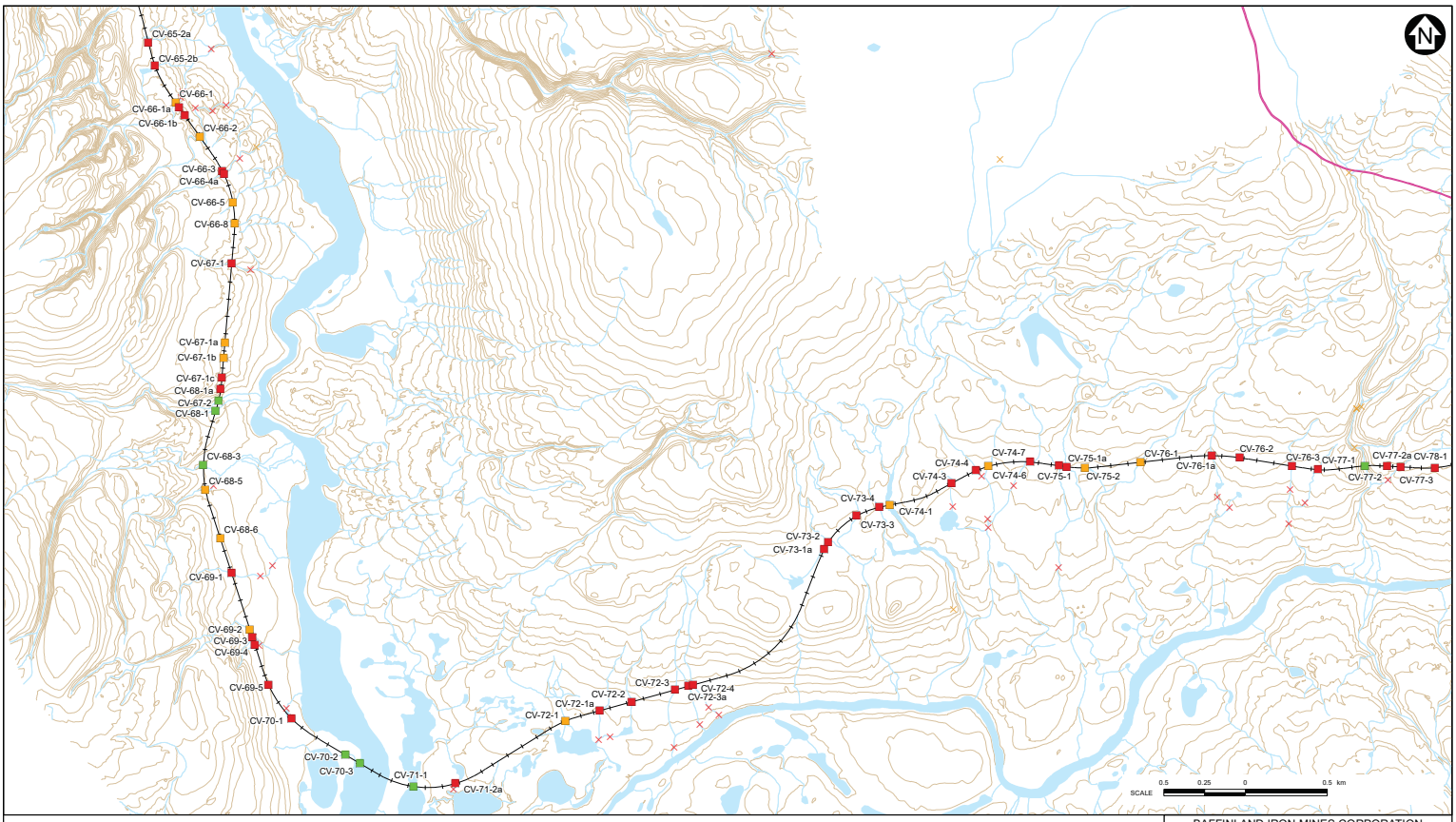
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 8 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 30/04/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\rail\2018_RailAlign_CharHab_MAP8_GE_v2.mxd



LEGEND:

ARCTIC CHAR HABITAT
- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2005.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

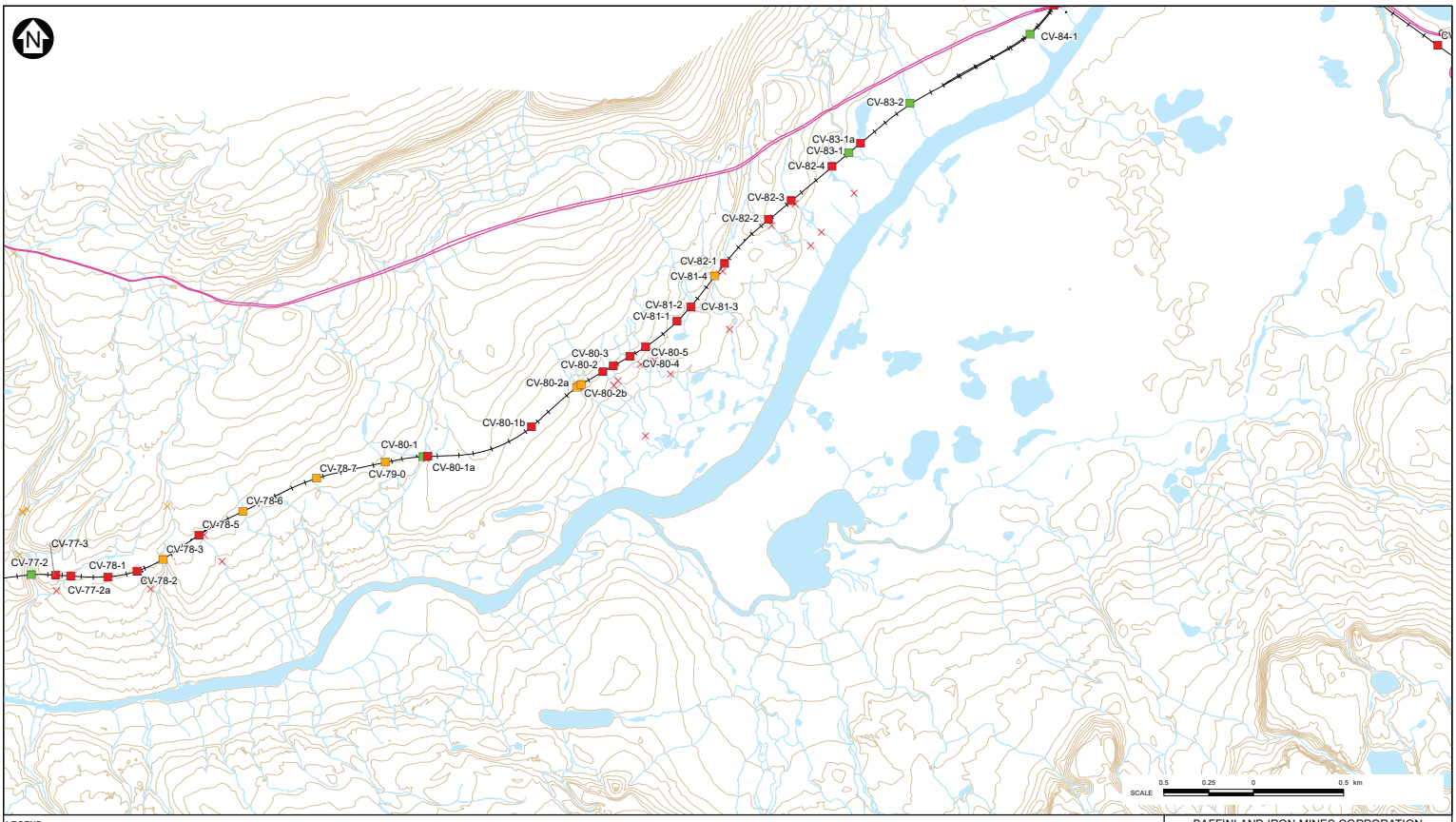
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 9 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.	REF NO.
-	-
DATE: 30/04/2019	REV -

Path: \\terrastation\GIS\Projects\Oltre\Mary River Freshwater\2010\Gen\rtd_Data\Report_Maps\TotePRD



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

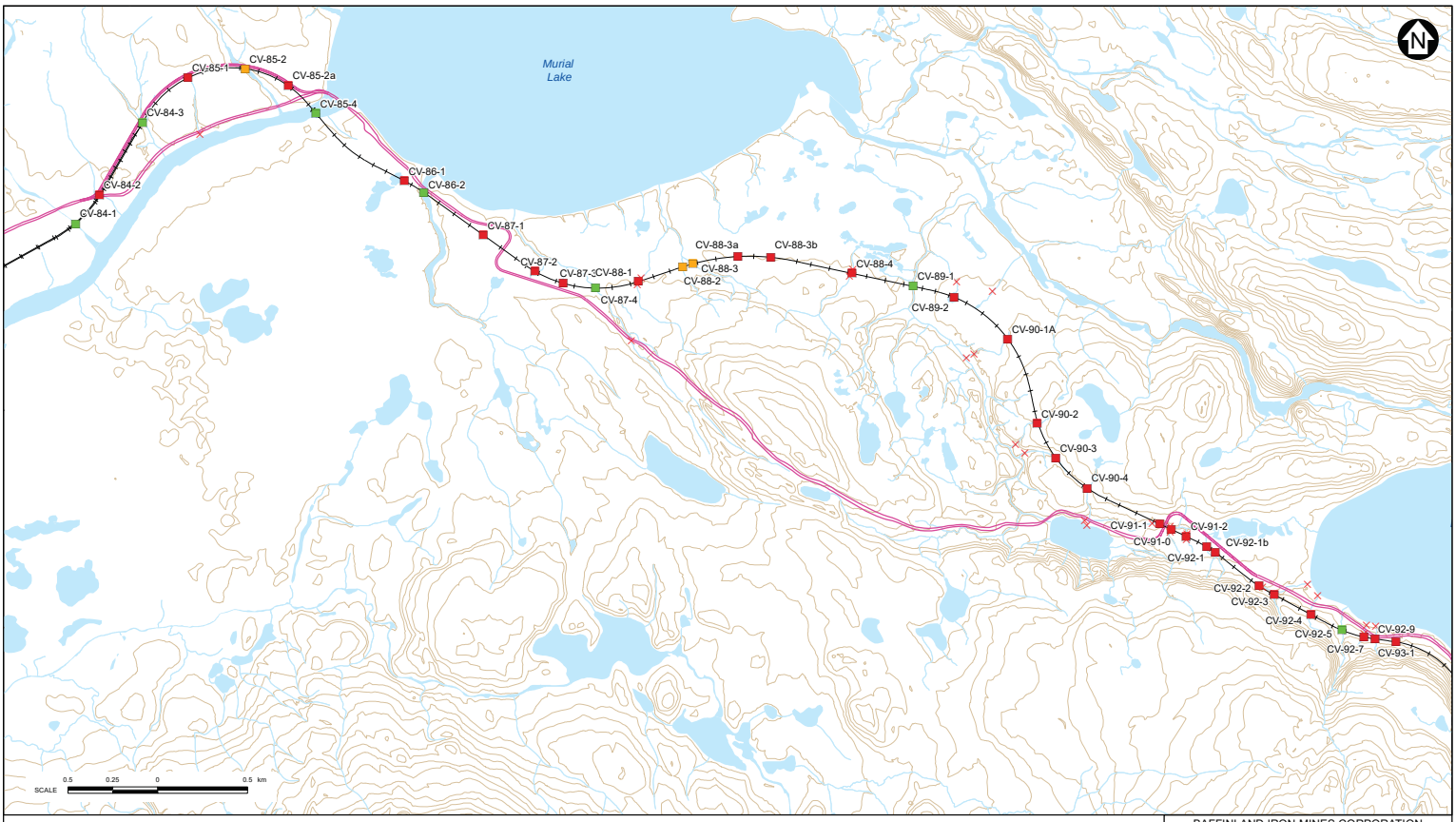
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 10 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.	REF NO.
-	-
DATE: 30/04/2019	REV -

Path: \\terrastation\GIS\Projects\Olive\Mary River Freshwater\2010\Gen\rd_Data\Report_Maps\ToteRD



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2005) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

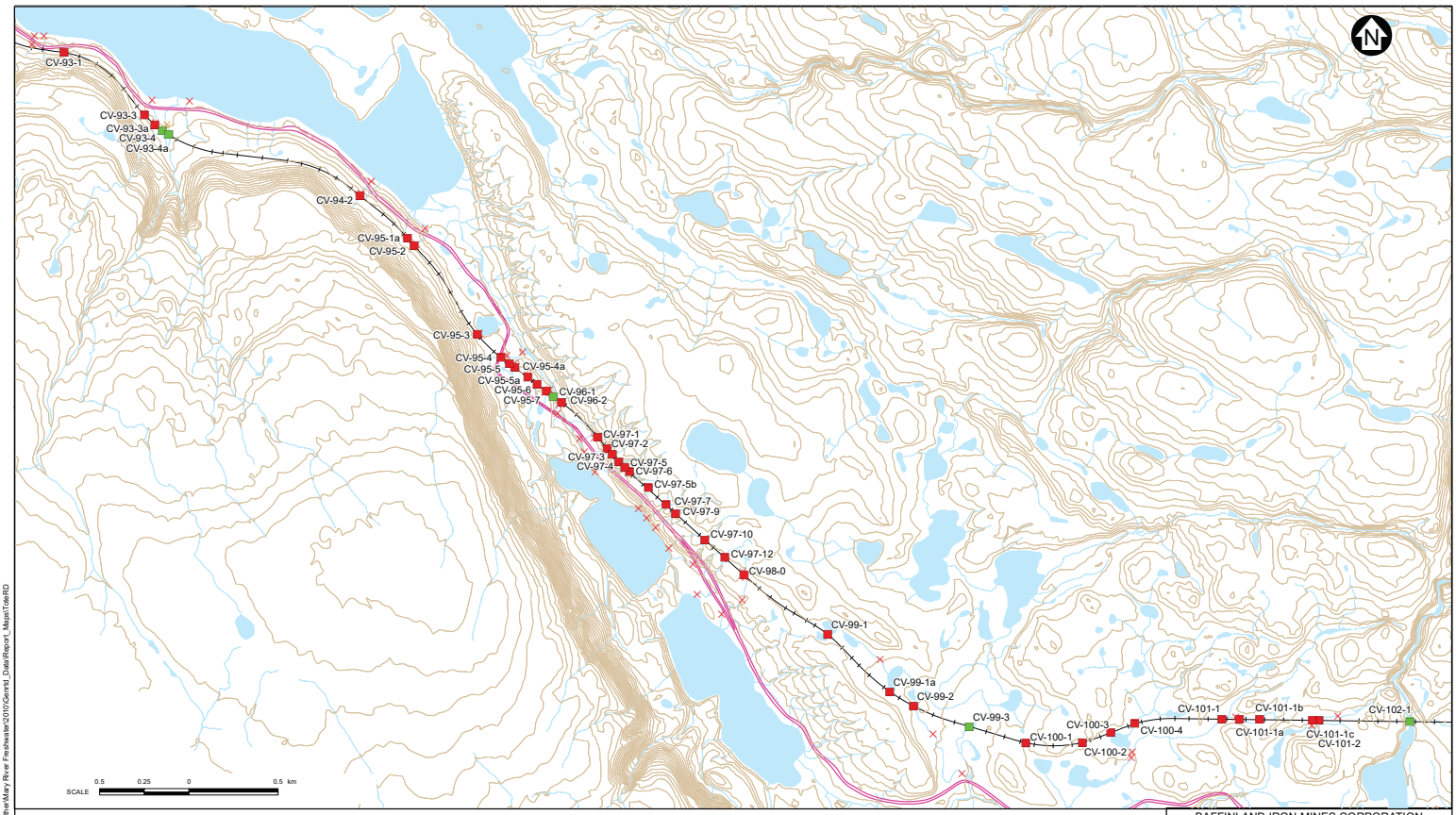
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 11 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.	REF NO.
-	-
DATE: 30/04/2019	REV -

Path: \\terrastation\GIS\Projects\Oth\e\Mary River Freshwater\2010\Gen\rd_Data\Report_Maps\TotteRD



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHT'S OF CANADA DEPARTMENT OF NATURAL RESOURCES (2005)) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS NORTH RAIL (MAP 12 OF 12)

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.	REF NO.
-	-
DATE: 30/04/2019	REV -

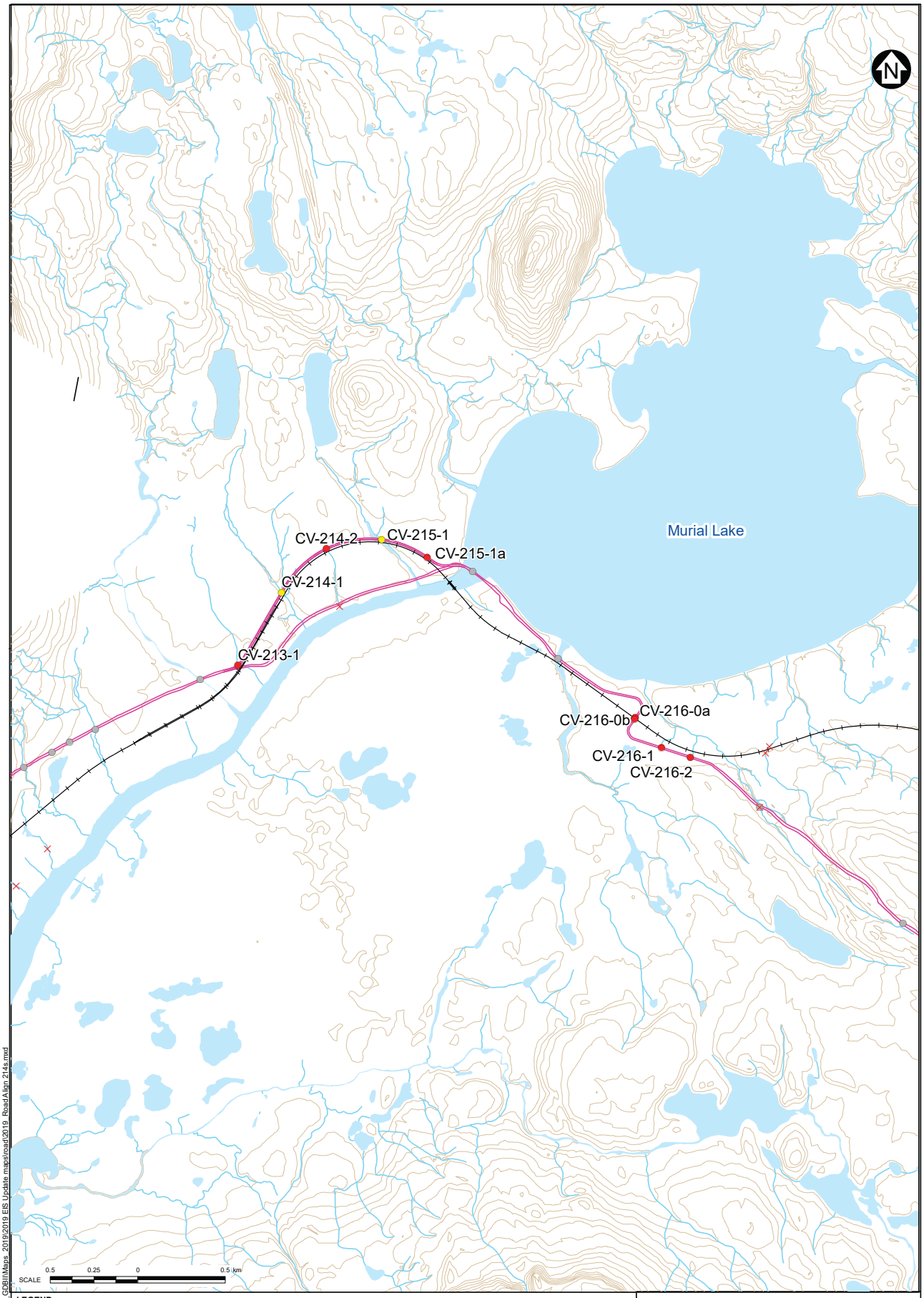
Path: \\terastation\GIS\Projects\Oltne\Mary River Freshwater\2010\Gen\fd_Data\Report_Maps\ToteRD

APPENDIX 3: LIST OF PROJECT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER AND FISH HABITAT DESIGNATIONS: TOTE ROAD

TABLE A3-1. LIST OF TOTE ROAD REALIGMENT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Road	CV-213-1	Culvert	S				540940	7921682	1	18	900	1	N	NFB	N	NFB	N	2009 (2) 2010-2017 (1 each)	New	n/a	n/a	n/a	Y
Road	CV-214-1	Culvert	S				541189	7922097	1	18	900	1	Y	MAR	P	MAR	Y	2009 (1) 2013 (1)	Moved	165	Y	Y	N
Road	CV-214-2	Culvert	S				541447	7922349	1	18	900	1	N	NFB	N	NFB	Y	2009 (2)	Moved	295	Y	Y	N
Road	CV-215-1	Culvert	S				541762	7922401	1	18	1200	2	P	MAR	P	MAR	Y	2009 (2)	Moved	307	N	N	Y
Road	CV-215-1a	Culvert	LP				542022	7922298	1	12	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	CV-216-0a	Culvert	LP				543213	7921382	1	18	600	1	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-216-0b	Culvert	LP				543207	7921374	1	18	600	1	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-216-1	Culvert	LP				543361	7921210	1	12	900	1	N	NFB	N	NFB	Y	-	Moved	27	Y	Y	N
Road	CV-216-2	Pond encroachment + Culvert	P				543525	7921156	1	12	900	1	N	NFB	N	NFB	Y	-	Moved	6	Y	Y	N
Road	CV-146-2	Culvert	S				508738	7968874	3	12	900	2	N	NFB	N	NFB	M	2009 (1)	Moved	25	Y	Y	N
Road	CV-146-2a	Culvert	LP				508769	7968779	1	30	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	CV-146-2b	Culvert	LP				508876	7968768	1	18	600	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	CV-146-2c	Culvert	LP				509023	7968625	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	CV-131-1b	Culvert	LP				511079	7967263	1	18	900	5	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-131-1a	Culvert	LP				511245	7967211	1	24	600	5	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-131-1	Culvert	S				511269	7967089	1	36	900	4	N	NFB	N	NFB	M	-	Moved	66	Y	Y	N
Road	CV-118-3	Culvert	LP				518472	7959868	1	18	600	5	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-118-2	Culvert	LP				518483	7959871	1	18	600	5	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-118-1	Culvert	S				518549	7959755	1	12	900	2	N	NFB	N	NFB	N	2009 (2)	New	-	-	-	Y
Road	CV-118	Culvert - Potential Modification	S				518495	7959746	1	12	900	5	N	NFB	N	NFB	Y	2009 (2)	Potentical Modification	-	-	Y	N
Road	CV-060-0	Culvert	LP				527500	7930452	1	30	1200	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	CV-060-1	Culvert	S				527517	7930366	3	24	1500	1	Y	IMP	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	N
Road	CV-060-3	Culvert	LP				527632	7930408	1	24	600	5	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-060-4	Culvert	LP				527615	7930405	1	24	600	5	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-060-2	Culvert	S				527747	7930275	2	24	1500	3	Y	IMP	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	N
Road	CV-059-1	Culvert	S				527981	7929336	2	24	1500	5	Y	MAR	N	NFB	Y	2009 (2) 2013-2017 (1 each)	NC	-	-	Y	N
Road	CV-020-2	Culvert	S				546893	7919846	1	18	900	5	N	NFB	N	NFB	Y	-	Moved	25	Y	Y	N
Road	CV-020-3	Culvert	S				546887	7919833	1	18	600	5	N	NFB	N	NFB	N	N/A	New	-	-	-	Y
Road	CV-91-0a	Culvert	S				546996	7919894	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	CV-91-3	Stream Infilling + Culvert	S				547123	7919788	1	18	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	BG-18	Culvert - Potential Modification	S				550648	7917693	1	36	1200	4	N	NFB	N	NFB	N	2009(1)	Potentical Modification	-	-	Y	N
Road	BG-17-1	Pond Encroachment	LP				550668	7917656	1	36	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	BG-15-1a	Culvert	S				550602	7917424	2	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	BG-15-1b	Culvert	S				550698	7917332	2	18	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	BG-14-1a	Culvert	S				550818	7917248	1	18	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	BG-14-1b	Culvert	S				550863	7917216	1	18	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	BG-14-1c	Culvert	S				550943	7917162	1	24	900	1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Road	BG-13-1	Culvert	S				551001	7917116	4	36	1800	1	Y	IMP	Y	IMP	Y	2009 (2) 2010-2017 (1 each)	NC	-	-	Y	N

N/A = not applicable; L = lake; LP = low point; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important; M = Moved; NC = No Change.
[1] M = moved but still in field survey area



Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\road\2019_RoadAlign_214s.mxd

LEGEND:

ARCTIC CHAR HABITAT

- NON FISH-BEARING
- MARGINAL
- IMPORTANT
- OTHER ROAD CROSSINGS

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

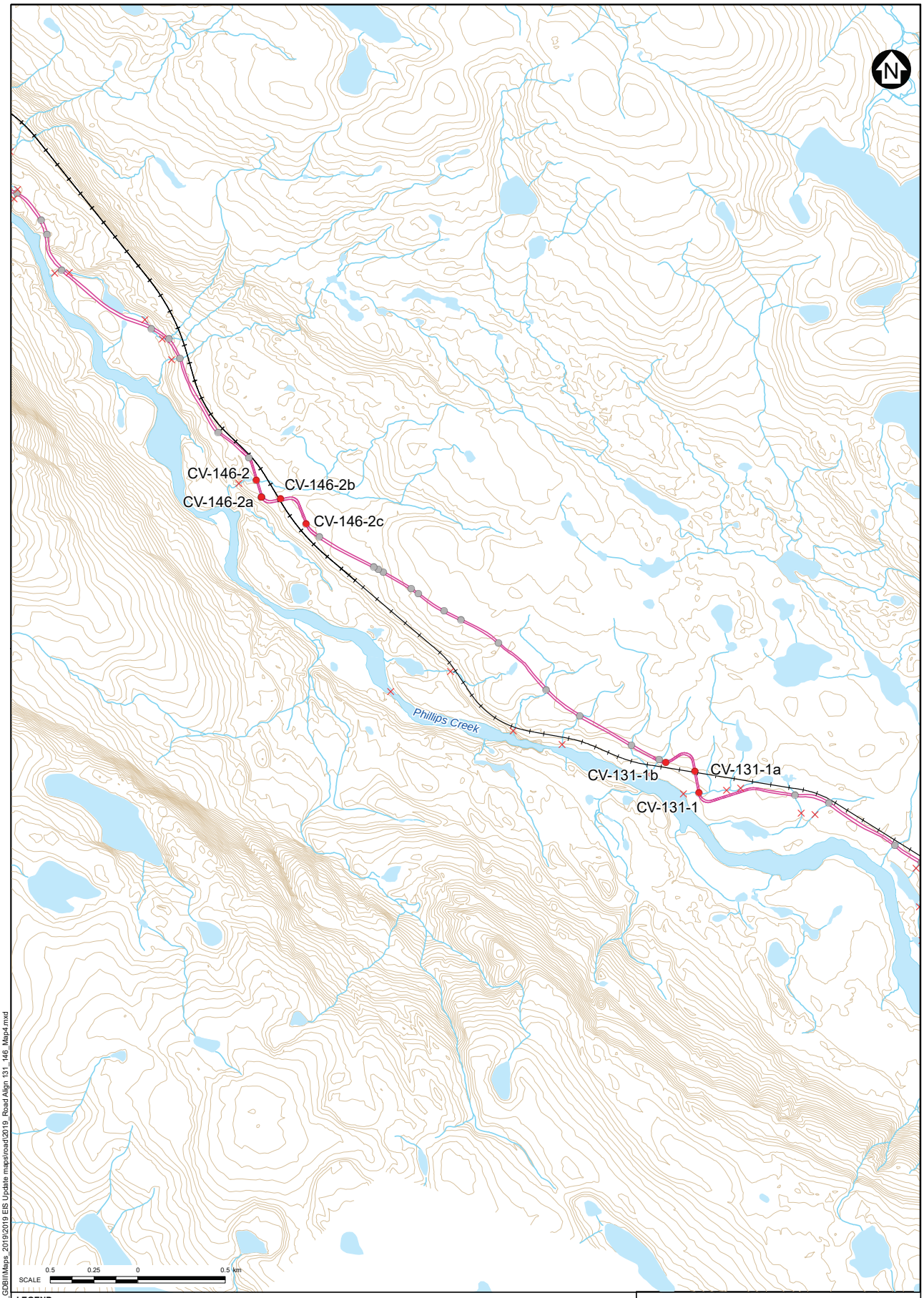
CHAR HABITAT DESIGNATIONS TOTE ROAD (MAP 1 OF 5)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 30/04/2019

REV 1



LEGEND:

ARCTIC CHAR HABITAT

- NON FISH-BEARING
- MARGINAL
- IMPORTANT
- OTHER ROAD CROSSINGS

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS TOTE ROAD (MAP 2 OF 5)

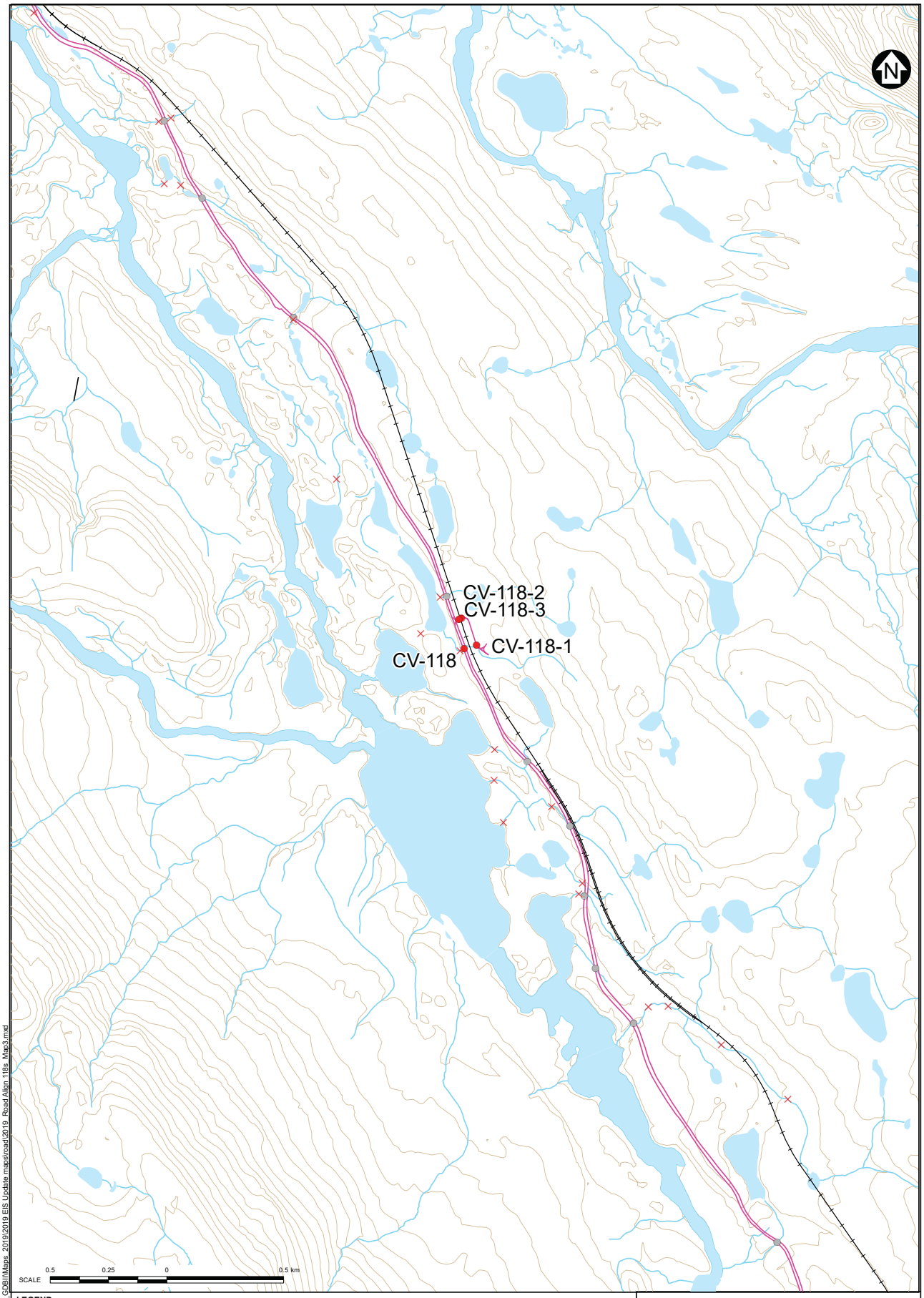
North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 30/04/2019

REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\road\2019_Road Align 131_146_Map4.mxd



LEGEND:

ARCTIC CHAR HABITAT

- NON FISH-BEARING
- MARGINAL
- IMPORTANT
- OTHER ROAD CROSSINGS

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

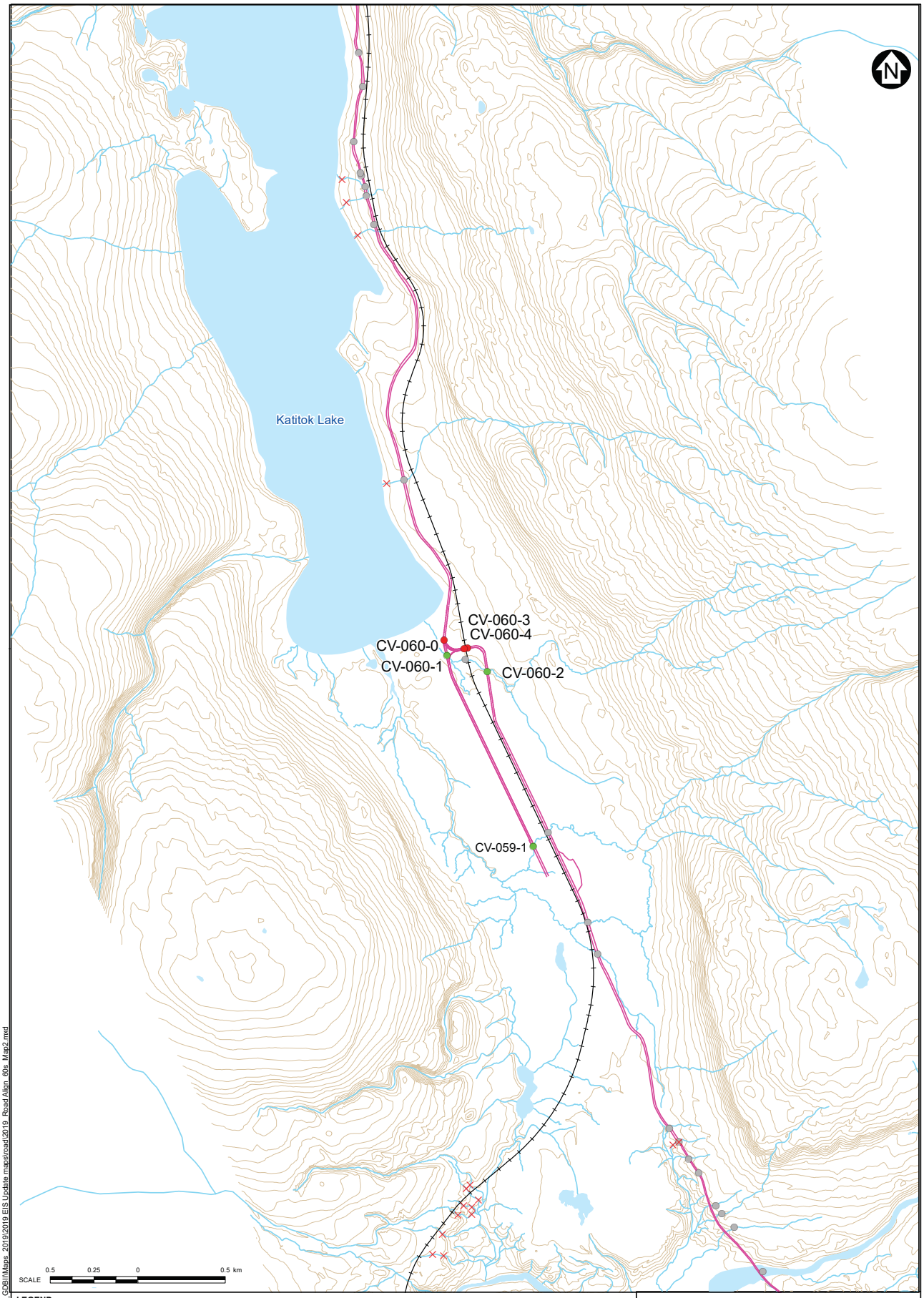
MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS TOTE ROAD (MAP 3 OF 5)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 30/04/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps 2019\2019 EIS Update maps\road\2019_Road Align 118s_Map3.mxd



LEGEND:

ARCTIC CHAR HABITAT

- NON FISH-BEARING
- MARGINAL
- IMPORTANT
- OTHER ROAD CROSSINGS

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS TOTE ROAD (MAP 4 OF 5)

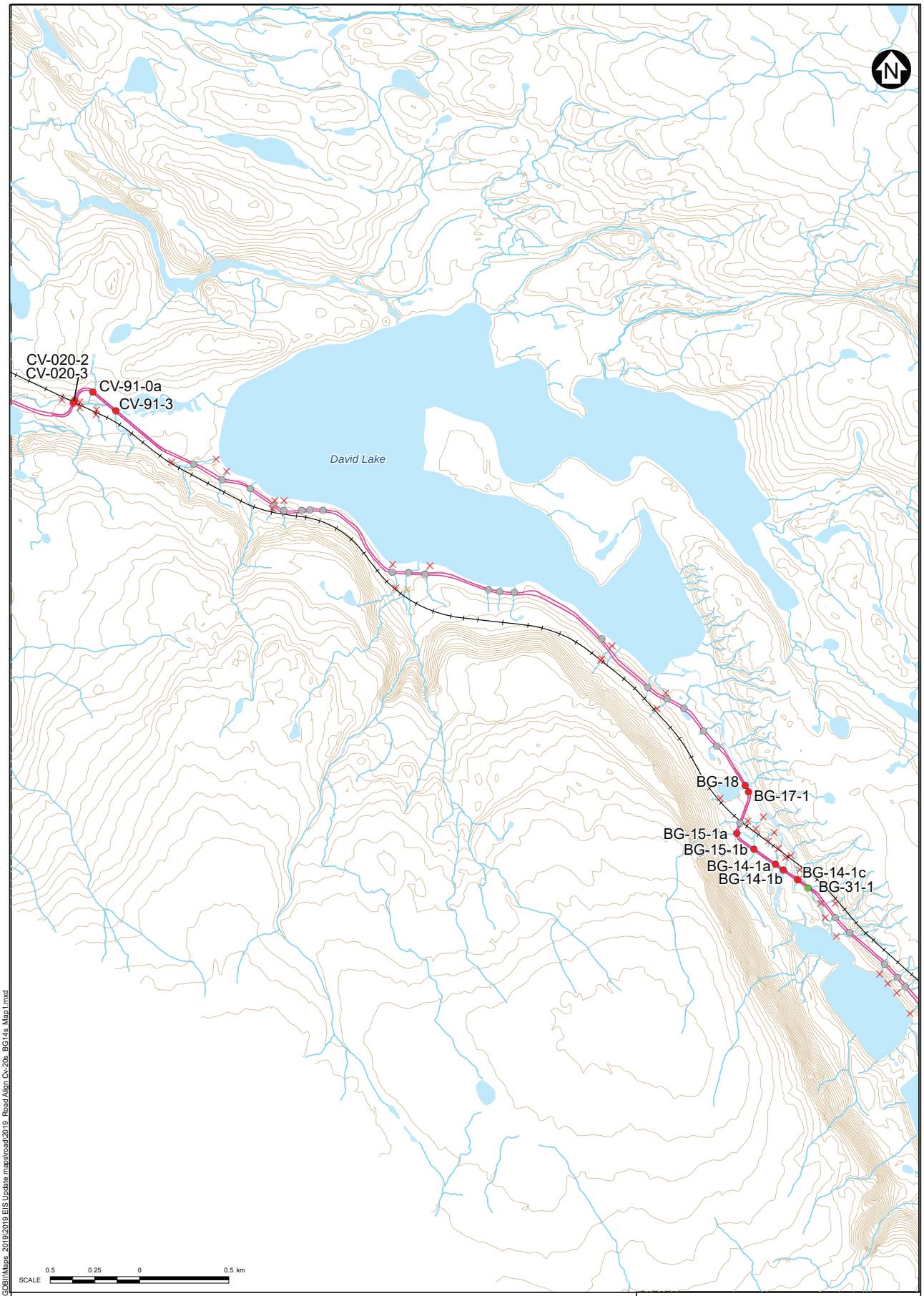
North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 01/05/2019

REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\road\2019_Road Align_60s_Map2.mxd



Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\road\2019_Road Align Cv-20s_BG14s_Map1.mxd

LEGEND:

ARCTIC CHAR HABITAT

- NON FISH-BEARING
- MARGINAL
- IMPORTANT
- OTHER ROAD CROSSINGS

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE

- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS TOTE ROAD (MAP 5 OF 5)

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 01/05/2019

REV 1

APPENDIX 4: LIST OF PROJECT INFRASTRUCTURE INTERACTIONS WITH FRESH WATER AND FISH HABITAT DESIGNATIONS: MINE AREA

TABLE A4-1. LIST OF MINE SITE INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Mine (Rail)	CV-102-2	Culvert	S			102134	556012	7915438	3	24	1200	1	Y	IMP	P	MAR	Y	2006 (1) 2007 (3) 2008 (2) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Mine (Rail)	CV-102-3	Culvert	S			102475	556352	7915471	1	18	900	2	N	NFB	N	NFB	M	2006 (1) 2007 (3) 2008 (2) 2009 (2) 2010-2017 (1 each)	Moved	29	Y	Y	N
Mine (Rail)	CV-102-4	Culvert	S			102579	556456	7915469	1	18	900	5	N	NFB	N	NFB	M	2006 (1) 2007 (3) 2008 (2) 2009 (2) 2010-2017 (1 each)	Moved	23	Y	Y	N
Mine (Rail)	CV-102-4a	Culvert	LP/S			103013	556885	7915404	1	12	900	3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine (Rail)	CV-102-5	Culvert	S			103244	557110	7915356	1	30	900	4	N	NFB	N	NFB	Y	2017 (1)	NC	-	-	Y	-
Mine (Rail)	CV-102-7	Culvert	LP			103411	557269	7915304	1	18	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine (Rail)	CV-102-7a	Pond Encroachment	P			103532	557379	7915248	N/A	N/A	N/A	N/A	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine (Rail)	CV-103-1	Culvert	S			103601	557449	7915244	4	48	1800	4	Y	IMP	Y	MAR	Y	2006 (1) 2007 (2) 2008 (2) 2009 (2) 2010-2017 (1 each)	NC	-	-	Y	-
Mine (Rail)	CV-104-0	Stream Infilling	S			103670	557514	7915207	N/A	N/A	N/A	N/A	N	NFB	N	NFB	Y	-	New	-	-	-	Y
Mine (Rail)	CV-104-1	Culvert	S			103732	557574	7915202	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-104-2	Culvert	S			104058	557881	7915094	1	24	900	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-104-3	Culvert	S			104179	557991	7915044	1	36	900	5	P	MAR	P	MAR	Y	2014 (1)	NC	-	-	Y	-
Mine (Rail)	CV-104-4	Culvert	LP			104359	558154	7914967	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-104-5	Plate Arch Culvert	S			104563	558340	7914885	1	48	AIL - SUPER-COR Arch SCA1 Span = 6.990 m Rise = 3.495 m Area = 19.20 m^2	5	Y	IMP	Y	MAR	Y	2006 (1) 2007 (2) 2008 (2) 2009 (2) 2010-2012 (1 each) 2013 (2) 2014 (2) 2015-2017 (1 each)	NC	-	-	Y	-
Mine (Rail)	CV-105-1	Culvert	S			104767	558523	7914793	1	18	900	3	P	MAR	P	MAR	M	-	Moved	28	Y	Y	N
Mine (Rail)	CV-105-2	Culvert + Stream and Pond Infilling + Stream Diversion	S/P			105000	558733	7914692	1	18	900	1	Y	MAR	Y	IMP	M	2014 (1) 2017 (1)	Moved	63	Y	Y	N

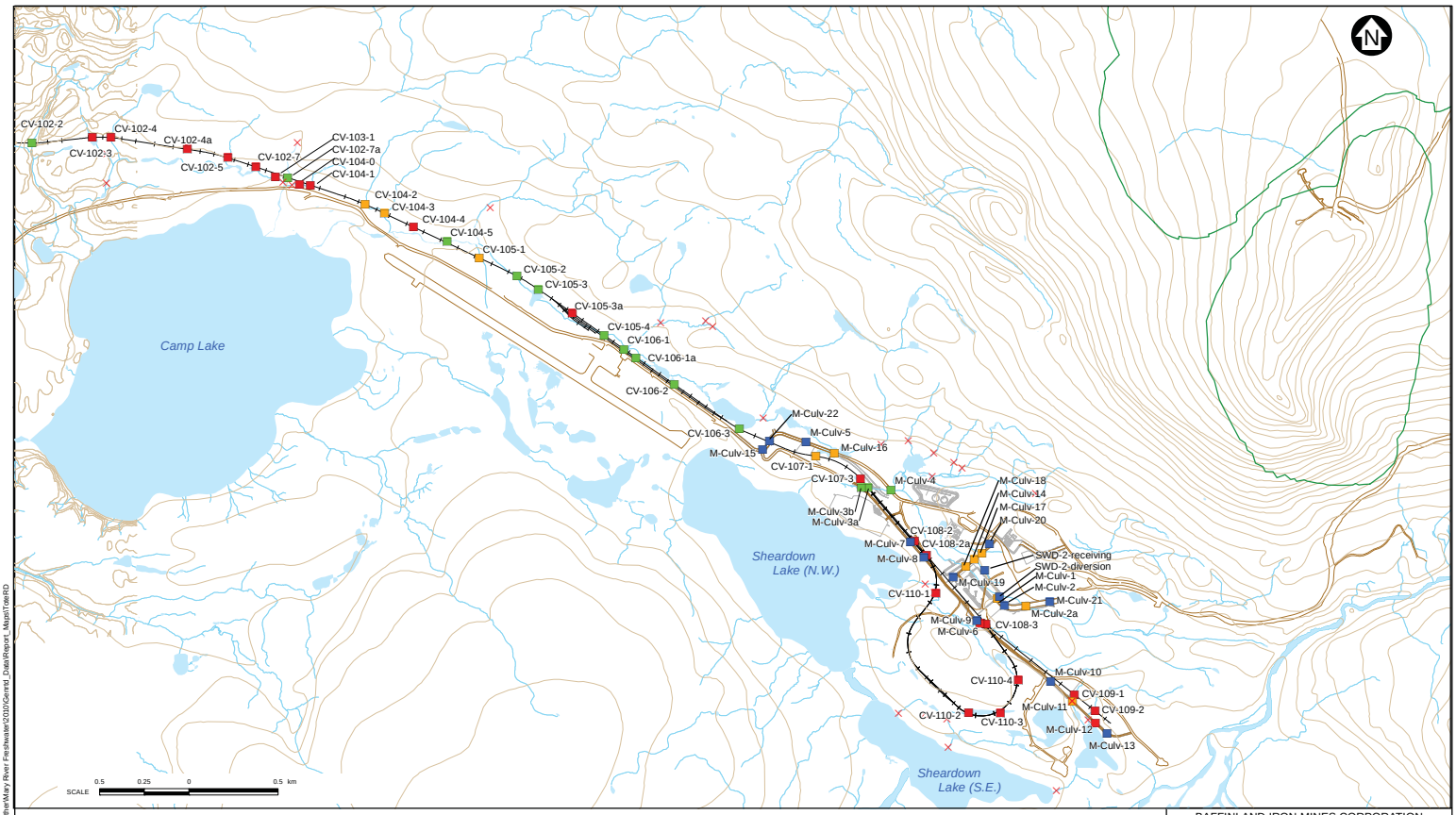
TABLE A4-1. LIST OF MINE SITE INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Mine (Rail)	CV-105-3	Pond Encroachment + Stream Crossing (receives stream diversion)	S/P		CV-105-4	105182	558886	7914594	1	18	900	5	Y	MAR	Y	IMP	M	2014 (1) 2017 (1)	Moved	22	Y	Y	N
Mine (Rail)	CV-105-3a	Culvert	LP		CV-105-4	105374	559044	7914484	1	40	900	2	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine (Rail)	CV-105-4	Stream diversion	S	CV-105-3		105592	559227	7914388	N/A	N/A	N/A	N/A	Y	MAR	Y	IMP	M	2014 (1) 2017 (1)	Moved	40	Y	Y	N
Mine (Rail)	CV-106-1	Pond Infilling + Culvert	P			105760	559360	7914263	1	30	1200	1	Y	MAR	Y	IMP	Y	2014 (1) 2017 (1)	NC	-	-	Y	-
Mine (Rail)	CV-106-1a	Stream Infilling. New stream to be built to the northeast	S			105810	559399	7914231	N/A	N/A	N/A	N/A	Y	MAR	Y	IMP	N	2014 (1) 2017 (1)	New	-	-	-	Y
Mine (Rail)	CV-106-2	Pond Infilling + Culvert	P			106072	559616	7914084	2	24	1500	1	Y	MAR	Y	IMP	Y	2014 (1) 2017 (1)	NC	-	-	Y	-
Mine (Rail)	CV-106-3	Pond Encroachment	P			106514	559980	7913834	N/A	N/A	N/A	N/A	Y	MAR	Y	IMP	Y	2014 (1) 2017 (1)	NC	-	-	Y	-
Mine (Rail)	CV-107-1	Pond Infilling + Culvert	P			106971	560409	7913682	1	24	600	5	P	MAR	P	MAR	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-107-3	Pond Infilling + Culvert	P			107258	560660	7913555	1	30	600	1	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-108-2	Culvert	LP			107722	560963	7913204	1	24	900	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-108-2a	Culvert	LP			107827	561031	7913124	1	24	900	5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine (Rail)	CV-108-3	Culvert	S			108338	561366	7912738	2	24	1500	5	N	NFB	N	NFB	Y	2007 (3)	NC	-	-	Y	-
Mine (Rail)	CV-109-1	Culvert	S			108970	561860	7912344	1	24	900	5	N	NFB	N	NFB	M	2007 (1) 2014 (1)	Moved	24	Y	Y	N
Mine (Rail)	CV-109-2	Culvert	S			109118	561976	7912252	1	24	900	5	N	NFB	N	NFB	M	2007 (1) 2014 (1)	Moved	41	Y	Y	N
Mine (Rail)	CV-110-1	Culvert	S			Potential Future Loop	561084	7912910	2	30	1200	5	N	NFB	N	NFB	Y	2007 (3)	NC	-	-	Y	-
Mine (Rail)	CV-110-2	Pond Encroachment + Culvert	P			Potential Future Loop	561266	7912241	2	30	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-110-3	Pond Infilling + Culvert	P			Potential Future Loop	561445	7912240	2	30	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Mine (Rail)	CV-110-4	Pond Infilling + Culvert	P			Potential Future Loop	561546	7912425	2	30	1200	5	N	NFB	N	NFB	Y	-	NC	-	-	Y	-
Mine	M-Culv-13	Culvert	None - Water Mgmt				562044	7912124	1	13.7	600	6.3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-12	Culvert	S				561977	7912184	2	11.6	600	8.4	N	NFB	N	NFB	Y	2007 (1) 2014 (1)	New	-	Y	Y (Rail CV-109-2)	-
Mine	M-Culv-11	Culvert	S				561849	7912305	1	15.0	600	2.9	P	MAR	P	MAR	Y	2007 (1) 2014 (1)	New	n/a	Y	Y (Rail CV-109-1)	-
Mine	M-Culv-10	Culvert	None - Water Mgmt				561728	7912418	1	10.0	600	5.0	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-6	Stream Crossing + Pond Encroachment	S/P				561331	7912741	1	16.4	1200	2.4	N	NFB	N	NFB	Y	-	New	-	-	-	Y
Mine	M-Culv-9	Culvert	None - Water Mgmt				561313	7912759	1	21.8	600	2.9	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-8	Culvert	None - Water Mgmt				561015	7913111	1	9.9	600	1.3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-7	Culvert	None - Water Mgmt				560941	7913198	1	10.2	600	3.9	N	NFB	N	NFB	N	-	New	-	-	-	Y

TABLE A4-1. LIST OF MINE SITE INFRASTRUCTURE INTERACTIONS WITH FRESH WATER
DATE: MAY 1, 2019

Study Area	Site ID	Project Interaction	Waterbody Type	Diversion To	Diversion From	Rail Chainage (m)	UTM		Culvert Design				Fish Habitat Designation				Assessed in Field 2018 (Y/N/M) [1]	Years Assessed Pre-2018 (# seasons)	Change From Phase 2 Proposal EIS				
							Easting	Northing	No. Barrels	Culvert Length (m)	Culvert Diameter (mm)	Slope (%)	Arctic Char		Ninespine Stickleback				Moved, New, No Change (NC), Modification	Distance of Move (m)	Site Within Field Assessed Area (Y/N)	Field Assessment Retained (Y/N)	Desktop Assessment Used (Y/N)
													Y/N/P	Habitat Quality	Y/N/P	Habitat Quality							
Mine	M-Culv-3A (CV-107-4)	Plate Arch Culvert	S				560706	7913504	1	30.3	AIL SUPER-COR STRUCTURE NO. [SB-5L]	4.1	Y	IMP	Y	IMP	Y	2006 (1) 2007 (3) 2008 (3) 2009 (2) 2010-2012 (1 each) 2013-2014 (2 each) 2015-2017 (1 each)	New	-	Y	Y (Rail CV-107-4)	-
Mine	M-Culv-3B (CV-186)	Plate Arch Culvert	S				560664	7913503	1	27.8	AIL SUPER-COR STRUCTURE NO. [SB-5L]	2.4	Y	IMP	Y	IMP	Y	2006 (1) 2007 (3) 2008 (3) 2009 (2) 2010-2012 (1 each) 2013-2014 (2 each) 2015-2017 (1 each)	New	-	Y	Y (Rail CV-107-4)	-
Mine	M-Culv-4	Culvert	S				560830	7913489	3	30.0	1500	0.7	Y	IMP	Y	IMP	N	2006 (1) 2007 (3) 2008 (3) 2009 (2) 2010-2012 (1 each) 2013-2014 (2 each) 2015-2017 (1 each)	New	-	-	-	Y (previous field surveys)
Mine	M-Culv-16	Pond Infilling + Culvert	P				560513	7913699	1	16.9	600	0.0	P	MAR	P	MAR	Y	-	New	-	-	-	Y
Mine	M-Culv-5	Culvert	None - Water Mgmt				560354	7913759	1	16.6	600	0.8	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-22	Culvert	None - Water Mgmt				560150	7913767	1	21.3	600	0.7	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-15	Culvert	None - Water Mgmt				560110	7913719	1	22.6	600	0.5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-19	Culvert	None - Water Mgmt				561180	7913002	1	13.5	600	2.0	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-18	Culvert	S				561252	7913062	1	13.5	600	0.4	P	MAR	P	MAR	N	2007 (3) 2008 (3) 2009 (2) 2010-2017 (1 each)	New	-	-	-	Y
Mine	M-Culv-14	Culvert	S		M-Culv-1		561298	7913101	1	13.1	900	1.2	P	MAR	P	MAR	N	2007 (3) 2008 (3) 2009 (2) 2010-2017 (1 each)	New	-	-	-	Y
Mine	M-Culv-17	Culvert	S				561342	7913138	1	25.5	600	5.1	P	MAR	P	MAR	N	-	New	-	-	-	Y
Mine	M-Culv-20	Culvert	None - Water Mgmt				561384	7913190	1	6.6	600	5.1	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-21	Culvert	None - Water Mgmt				561721	7912863	1	31.7	600	0.5	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	M-Culv-1	Culvert	S	M-Culv-14			561427	7912883	1	34.9	600	0.2	P	MAR	P	MAR	N	-	New	-	-	-	Y
Mine	M-Culv-2a	Culvert	S				561588	7912840	2	66.0	1200	2.5	P	MAR	P	MAR	N	-	New	-	-	-	Y
Mine	M-Culv-2	Culvert	None - Water Mgmt				561468	7912842	1	40.0	600	0.3	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	SWD-2 Receiving	Receiving Diversion	S		SWD-2 Diversion		561356	7913040	N/A	N/A	N/A	N/A	N	NFB	N	NFB	N	-	New	-	-	-	Y
Mine	SWD-2 Diversion	Stream Diversion	S	SWD-2 Receiving			561438	7912893	N/A	N/A	N/A	N/A	N	NFB	N	NFB	N	-	New	-	-	-	Y

N/A = not applicable; L = lake; LP = low point; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important; M = Moved; NC = No Change.
[1] M = moved but still in field survey area



LEGEND:

ARCTIC CHAR HABITAT

- NO
- POTENTIAL
- YES
- NO WATERBODY - WATER MANAGEMENT ONLY

- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHT'S OF CANADA DEPARTMENT OF NATURAL RESOURCES (1006) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 50 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CHAR HABITAT DESIGNATIONS MINE SITE

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO. -
REF NO. -
DATE: 01/05/2019
REV -

Path: \\terastation\GIS\Projects\Other\Mary River Freshwater\2010\General_Data\Report_Maps\TotalRD

APPENDIX 5: QUARRY AND LAYDOWN AREAS AND TEMPORARY ROADS: RESULTS OF SCREENING EXERCISE FOR INTERACTIONS WITH FISH HABITAT

TABLE A5-1. RESULTS OF NORTH RAIL CONSTRUCTION ACCESS ROAD SCREENING FOR POTENTIAL INTERACTIONS WITH FISH HABITAT
DATE: MAY 1, 2019

Access Road Name	UTM Start Left		UTM Start Right		Waterbodies Present (Y/N)	Waterbody Type	Can Waterbody Be Avoided (Y/N/P)	Fish Habitat Affected (Y/N/P)	Comments	Fish Habitat Designation			
										Arctic Char		Ninespine Stickleback	
	Easting	Northing	Easting	Northing						Y/N/P	Habitat Quality	Y/N/P	Habitat Quality
Access Road # 1	504166	7974089	504223	7974007	Y	S	N	N	Two NFB streams within boundaries, must be crossed	N	NFB	N	NFB
Access Road # 2	504627	7973703	504698	7973632	Y	S	Y	N	Two NFB streams within boundaries, can be avoided	N	NFB	N	NFB
Access Road # 3	505008	7973255	505083	7973183	Y	S	P	N	Two NFB streams within boundaries, both likely must be crossed	N	NFB	N	NFB
Access Road # 4	505474	7972664	505540	7972608	Y	S	Y	N	NFB stream within boundaries that can be avoided	N	NFB	N	NFB
Access Road # 5	505942	7971815	505995	7971730	Y	S	N	N	NFB stream within boundaries that must be crossed	N	NFB	N	NFB
Access Road # 6	506447	7971403	506525	7971341	Y	P	P	N	NFB roadside pond partially within boundary	N	NFB	N	NFB
Access Road # 7	507238	7971035	507327	7970988	Y	S	P	N	Branched NFB stream within boundaries that may be difficult to avoid	N	NFB	N	NFB
Access Road # 8	508433	7969297	508494	7969218	N	N/A	N/A	N/A	No Waterbodies	N/A	N/A	N/A	N/A
Access Road # 9	509924	7967737	509866	7967832	Y	S	P	N	NFB stream within boundaries that likely must be crossed	N	NFB	N	NFB
Access Road # 10	511899	7967092	511993	7967057	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 11	513452	7966368	513544	7966328	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 12	514238	7965626	514321	7965567	Y	S	P	N	NFB stream within boundaries that likely must be crossed	N	NFB	N	NFB
Access Road # 13	515251	7964026	515287	7963932	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 14	517078	7962230	517151	7962161	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 15	518043	7961140	518086	7961050	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 16	518940	7959047	518984	7958956	Y	S	Y	N	NFB stream within boundary can be avoided	N	NFB	N	NFB
Access Road # 17	520025	7957396	520083	7957314	Y	S	N	N	NFB marshy area that likely must be crossed	N	NFB	N	NFB
Access Road # 18	520875	7955315	520906	7955220	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 19	521307	7954685	521343	7954592	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 20	521645	7953657	521662	7953558	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 22	521800	7952168	521825	7952071	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 23	521937	7951626	521954	7951527	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 24	521764	7949482	521773	7949383	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 25	522243	7948302	522281	7948210	Y	S	N	N	NFB stream within corridor that cannot be avoided	N	NFB	N	NFB
Access Road # 26	522503	7947121	522481	7947024	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 27	522751	7945575	522796	7945485	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 28	523193	7944802	523219	7944705	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 29	523343	7943298	523355	7943199	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 30	523409	7942395	523428	7942297	Y	S	Y	N	NFB stream in corridor that can be avoided	N	NFB	N	NFB
Access Road # 31	523620	7941319	523667	7941231	Y	S	Y	N	NFB stream in corridor that can be avoided	N	NFB	N	NFB
Access Road # 32	524160	7940436	524215	7940353	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 33	524963	7939046	525008	7938957	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 34	525354	7938433	525380	7938335	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 35	525591	7937595	525628	7937502	Y	S	Y	N	Marshy area, can be avoided	N	NFB	N	NFB
Access Road # 36	526828	7935442	526842	7935343	N	N/A	N/A	N/A	No waterbodies				
Access Road # 37	526872	7934959	526877	7934859	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 38	527063	7933761	527056	7933661	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 39	527118	7932827	527158	7932735	Y	S	P	N	NFB stream that may be avoided	N	NFB	N	NFB
Access Road # 40	527300	7932185	527319	7932284	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 41	527210	7931722	527235	7931625	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 42	527508	7930926	527542	7930832	Y	S	Y	N	NFB stream that can be avoided	N	NFB	N	NFB
Access Road # 43	527702	7930177	527745	7930087	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A

TABLE A5-1. RESULTS OF NORTH RAIL CONSTRUCTION ACCESS ROAD SCREENING FOR POTENTIAL INTERACTIONS WITH FISH HABITAT
DATE: MAY 1, 2019

Access Road Name	UTM Start Left		UTM Start Right		Waterbodies Present (Y/N)	Waterbody Type	Can Waterbody Be Avoided (Y/N/P)	Fish Habitat Affected (Y/N/P)	Comments	Fish Habitat Designation			
										Arctic Char		Ninespine Stickleback	
	Easting	Northing	Easting	Northing						Y/N/P	Habitat Quality	Y/N/P	Habitat Quality
Access Road # 44	528304	7928895	528332	7928799	Y	S	Y	Y	Fish-bearing stream within corridor that cannot be avoided	Y	IMP	Y	IMP
Access Road # 45	528191	7927850	528235	7927950	Y	S	P	Y	Potential fish-bearing stream within corridor that likely must be crossed	P	MAR	P	MAR
Access Road # 46	536803	7919035	536709	7918991	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 47	538473	7919654	538385	7919603	Y	S	Y	N	NFB stream/marshy area that may be within corridor; avoidable	N	NFB	N	NFB
Access Road # 48	539715	7920772	539636	7920706	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 49	541000	7921682	541093	7921720	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 50	543541	7921204	543626	7921146	Y	S	Y	N	NFB stream within corridor, but can be avoided	N	NFB	N	NFB
Access Road # 51	546429	7920056	546519	7920012	Y	S	Y	N	NFB stream within corridor, but can be avoided	N	NFB	N	NFB
Access Road # 52	548026	7919249	548126	7919228	Y	S	Y	N	NFB stream within corridor, but can be avoided	N	NFB	N	NFB
Access Road # 53	548622	7918914	548735	7918879	Y	S	Y	N	NFB stream within corridor, but can be avoided	N	NFB	N	NFB
Access Road # 54	549854	7918507	549918	7918427	Y	S	Y	N	NFB stream within corridor, but can be avoided	N	NFB	N	NFB
Access Road # 55	551023	7917182	550974	7917223	Y	S	Y	N	Important fish-bearing stream within corridor; road will be aligned to avoid the stream.	Y	IMP	Y	IMP
Access Road # 56	551772	7916483	551845	7916414	Y	S	Y	N	NFB stream within corridor, but can be avoided	N	NFB	N	NFB
Access Road # 57	552512	7915536	552648	7915403	Y	S	N	N	NFB streams within corridor that can be avoided	N	NFB	N	NFB
Access Road # 58	553389	7915200	553458	7915167	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 59	554614	7915456	554714	7915455	Y	S	Y	N	NFB stream in corridor that can be avoided	N	NFB	N	NFB
Access Road # 60	556031	7915438	556131	7915441	Y	S	Y	Y	Important fish-bearing stream within corridor that cannot be avoided	Y	IMP	P	IMP
Access Road # 61	556662	7915422	556762	7915407	Y	S	Y/N	P	Potential fish-bearing branch of CV-224 stream within corridor that may or may not be avoidable and another NFB stream that is unavoidable	P and N	MAR + NFB	P and N	MAR + NFB
Access Road # 62	557651	7915177	557748	7915151	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 63	557987	7915056	558077	7915013	Y	S	N	P	Important fish-bearing that can be avoided and potential fish-bearing branch of same stream that cannot be avoided	P	MAR	P	MAR
Access Road # 64	558433	7914834	558521	7914786	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 66	558957	7914526	559042	7914473	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 67	559250	7914340	559332	7914283	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 68	559644	7914064	559726	7914007	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 69	559885	7913896	559969	7913841	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 70	560234	7913726	560329	7913695	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Access Road # 73	560847	7913338	560782	7913414	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A

N/A = not applicable; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important.

TABLE A5-2. RESULTS OF LAYDOWN AREA SCREENING FOR POTENTIAL INTERACTIONS WITH FISH HABITAT
DATE: MAY 1, 2019

Site ID	UTM		Waterbodies Present (Y/N)	Waterbody Type	Can Waterbody Be Avoided (Y/N/P)	Fish Habitat Affected (Y/N/P)	Comments	Fish Habitat Designation			
								Arctic Char		Ninespine Stickleback	
	Easting	Northing						Y/N/P	Habitat Quality	Y/N/P	Habitat Quality
LD-01	504032	7974598	Y	S	Y	N	NFB stream barely within boundaries and road/rail diversion	N	NFB	N	NFB
LD-02	504049	7974015	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-03	504492	7973629	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-04	504975	7972676	Y	S/P	Y	P	Laydown area includes uppermost reach of order 1 stream with small pond that have not been assessed in the field and may be fish-bearing	P	MAR	N	NFB
LD-05	505809	7971791	Y	P	P	P	Pond is isolated and may have some depth west of the footprint, but within footprint it is shallow	P	MAR	P	MAR-IMP
LD-06	506328	7971603	Y	S	Y	N	No waterbodies; existing laydown area	N	NFB	N	NFB
LD-07	510799	7967350	Y	S	Y	N	NFB stream barely within boundary of NE corner can be avoided	N	NFB	N	NFB
LD-08	514586	7965207	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-09	517314	7961896	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-10	521691	7953050	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-11	522987	7945108	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-12	524032	7940555	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-13	527217	7932786	Y	S	Y	N	NFB stream through the middle of laydown	N	NFB	N	NFB
LD-14	527169	7932595	N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LD-15	528177	7928987	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-16	528241	7929131	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-17	528359	7929018	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-18	528318	7929012	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-19	528375	7928223	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-20	529261	7916527	Y	S + P	N	N	If construction is limited to winter, no impact on fish habitat	Y	IMP	Y	MAR-IMP
LD-21	540504	7921426	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-22	542504	7921907	Y	P	N	N	A few small NFB marshy/pond/low point areas within footprint	N	NFB	N	NFB
LD-23	542999	7921484	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-24	543186	7921431	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-25	547058	7919695	Y	S	P	N	Three NFB streams run through laydown area	N	NFB	N	NFB
LD-26	554771	7914864	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-27	555311	7914685	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-28	556192	7915288	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
LD-29	558174	7914997	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-30	560010	7913726	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-31	560886	7913353	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-32	560829	7913258	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LP2	503759	7975875	Y	P	N	N	Two NFB ponds within boundary	N	NFB	N	NFB
LP3	503165	7975167	Y	P	N	N	Multiple NFB ponds within boundary; all assessed in 2018	N	NFB	N	NFB
LP5	503373	7974903	Y	S + P	N	N	Multiple NFB ponds and streams in footprint that will not be avoided	N	NFB	N	NFB
LP7	503735	7974706	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
W10A	503498	7975166	N	N/A	N/A	N/A	No waterbodies; existing laydown area	N/A	N/A	N/A	N/A
W10B	503492	7975066	Y	S	N	N	One NFB stream that has already been diverted due to existing infrastructure	N	NFB	N	NFB

N/A = not applicable; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important.

TABLE A5-3. RESULTS OF QUARRY AREA SCREENING FOR POTENTIAL INTERACTIONS WITH FISH HABITAT
DATE: MAY 1, 2019

Site ID	UTM		Waterbodies Present (Y/N)	Waterbody Type	Can Waterbody Be Avoided (Y/N/P)	Fish Habitat Affected (Y/N/P)	Comments	Fish Habitat Designation			
	Easting	Northing						Arctic Char		Ninespine Stickleback	
								Y/N/P	Habitat Quality	Y/N/P	Habitat Quality
D1Q1	563055	7914645	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
D1Q2	563376	7913330	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ2A	521827	7955356	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ2	527833	7926036	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ5	505764	7972642	Y	S	N	N	Includes the upper reaches of multiple NFB streams that likely are never wetted that far US and are unconnected DS	N	NFB	N	NFB
PQ10A	531568	7917522	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ10B	531982	7917635	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ12A	539072	7921210	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ12B	539898	7921837	Y	S	P	P	Aavoids main branch of CV-030, but footprint still impacts two tributaries that may also be fish-bearing	P	MAR	P	MAR
PQ13	542676	7923983	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ14A	550836	7917829	Y	S	P	P	Two unsurveyed, but likely NFB streams that flow into BG-17 rail and road within footprint	P	MAR	P	MAR
PQ14B	550983	7917458	Y	S	N	N	Three NFB streams within footprint	N	NFB	N	NFB
PQ15A	555853	7915626	Y	S + P	P	P	Footprint area includes a pond and a small stream that appear to be isolated and likely no fish-bearing from imagery, but they have not previously been surveyed	P	MAR	P	MAR
PQ15B	555270	7915586	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ2B	517664	7961973	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ4A	523697	7942901	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ4B	523651	7941894	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ5A	525439	7938839	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ5B	526119	7937802	Y	S	P	N	One NFB stream that is rarely wet and barriers DS	N	NFB	N	NFB
PQ6A	528552	7929763	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ6B	528993	7928994	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ9A	527378	7920441	Y	S	P	P	Upstream branches of potential fish-bearing stream within boundary	P	MAR	P	MAR
PQ9B	527651	7920425	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q1	504070	7974944	Y	S	N	N	Partial existing quarry that extends south to include a new NFB stream	N	NFB	N	NFB
Q10	510638	7967431	Y	S	Y	N	Small portion of NFB stream in extreme upper NW of boundary	N	NFB	N	NFB
Q11	513679	7966223	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q13	514295	7965314	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q16	521838	7952395	Y	S	N	N	NFB stream within boundary	N	NFB	N	NFB
Q19	523024	7945186	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q21	524356	7940085	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q23	525886	7936586	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q24	527063	7934336	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q27	527208	7923193	Y	S	P	P	Two branches of a stream DS of rail that may also be DS of barriers	P	MAR	P	MAR
Q4	507438	7970518	Y	P	N	N	NFB roadside pond within boundary	N	NFB	N	NFB
Q42	561673	7912667	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q6	507804	7969988	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
QMR2 (Q41)	559982	7914323	N	N/A	N/A	N/A	No waterbodies; partially already in use as quarry	N/A	N/A	N/A	N/A
Rail Sand Pit	528498	7927790	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A

N/A = not applicable; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important.

TABLE A5-4. RESULTS OF QUARRY AND LAYDOWN AREA ACCESS ROAD SCREENING FOR POTENTIAL INTERACTIONS WITH FISH HABITAT
DATE: MAY 1, 2019

New Site ID	Waterbodies Present (Y/N)	Waterbody Type	Can Waterbody Be Avoided (Y/N/P)	Fish Habitat Affected (Y/N/P)	Comments	Fish Habitat Designation			
						Arctic Char		Ninespine Stickleback	
						Y/N/P	Habitat Quality	Y/N/P	Habitat Quality
LD-01	Y	S	Y	N	NFB water diversion channel for port site	N	NFB	N	NFB
LD-02	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-03	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-04	Y	S	N	Y	Marginal fish-bearing stream flowing parallel to Tote Road that will be crossed by access road to this laydown	Y	MAR	N	NFB
LD-05	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-06	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-07	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-08	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-09	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-10	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-11	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-12	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-13	Y	S	Y	N	NFB stream through the middle of laydown area; can be avoided by access road	N	NFB	N	NFB
LD-14	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-15	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-16	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-17	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-18	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-19	N	N/A	N/A	N/A	No waterbodies; access is from the rail	N/A	N/A	N/A	N/A
LD-20	N	N/A	N/A	N/A	No waterbodies; access is from the rail	N/A	N/A	N/A	N/A
LD-21	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-22	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-23	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-24	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-25	N	N/A	P	N	Three NFB streams in corridor that likely cannot all be avoided	N	NFB	N	NFB
LD-26	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-27	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-28	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-29	Y	S	N	P	Access road will cross one potentially fish-bearing stream	P	MAR	P	MAR
LD-30	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-31	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LD-32	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LP2	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
LP3	Y	P	N	N	NFB waterbodies that are planned for diversion	N	NFB	N	NFB
LP5	Y	P	N	N	NFB waterbodies that are planned for diversion	N	NFB	N	NFB
LP7	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
W10A	N	N/A	N/A	N/A	No waterbodies; existing access	N/A	N/A	N/A	N/A
W10B	N	N/A	N/A	N/A	No waterbodies; existing access	N/A	N/A	N/A	N/A

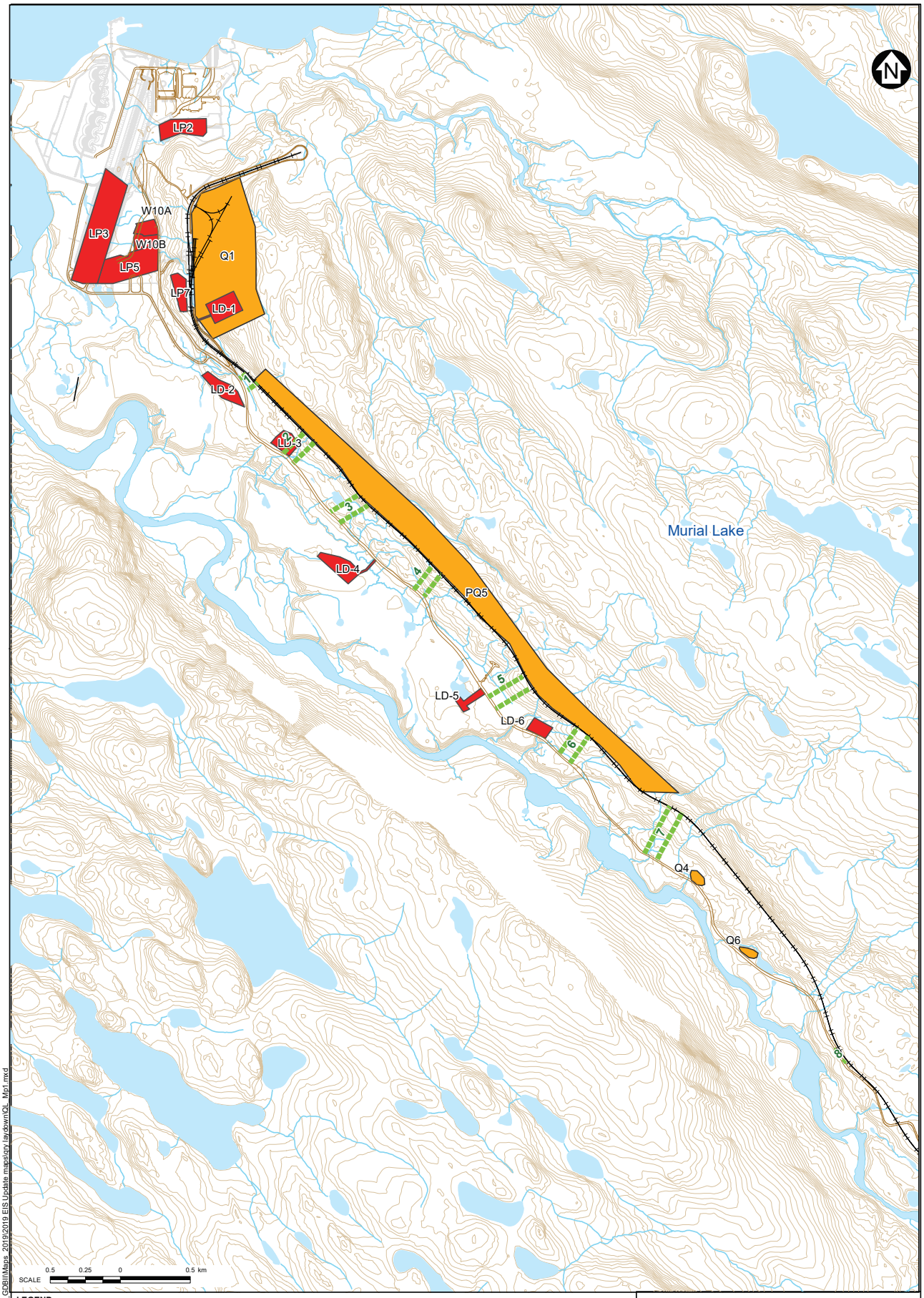
TABLE A5-4. RESULTS OF QUARRY AND LAYDOWN AREA ACCESS ROAD SCREENING FOR POTENTIAL INTERACTIONS WITH FISH HABITAT
DATE: MAY 1, 2019

New Site ID	Waterbodies Present (Y/N)	Waterbody Type	Can Waterbody Be Avoided (Y/N/P)	Fish Habitat Affected (Y/N/P)	Comments	Fish Habitat Designation			
						Arctic Char		Ninespine Stickleback	
						Y/N/P	Habitat Quality	Y/N/P	Habitat Quality
D1Q1	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
D1Q2	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ5	Y	S	Y	N	Several NFB streams but all can likely be avoided by access road	N	NFB	N	NFB
PQ10A	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ10B	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ12A	Y	S	N	N	NFB stream crosses corridor and cannot be avoided	N	NFB	N	NFB
PQ12B	Y	S	N	P	Access road will cross one or two unsurveyed branches of a known fish-bearing stream; these tributaries may also be fish-bearing	P	MAR	P	MAR
PQ13	Y	S	N	P	A previously unassessed order 3 stream that is likely fish-bearing will be crossed by access road. Three additional order 1 streams may also be crossed but are likely NFB	P	MAR-IMP	P	MAR-IMP
PQ14A	Y	S	N	P	Access road will cross one or two unsurveyed, but likely NFB streams	P	MAR	P	MAR
PQ14B	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ15A	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ15B	Y	S	N	N	NFB stream crosses corridor and cannot be avoided	N	NFB	N	NFB
PQ2B	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ4A	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ4B	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ5A	Y	S	N	N	NFB stream crosses corridor and cannot be avoided	N	NFB	N	NFB
PQ5B	Y	S	Y	N	Three NFB streams within corridor that can all be avoided	N	NFB	N	NFB
PQ6A	Y	S	P	P	Uppermost reach of known fish-bearing stream that cannot be avoided by access road. Fish access this far upstream is unknown	P	MAR	N	NFB
PQ6B	Y	S	N	Y	Access crosses same important fish-bearing stream twice, though the upper crossing may be upstream of barriers and no longer fish-bearing. Stream has not previously been surveyed this far upstream	Y	MAR	N	NFB
PQ9A	Y	S	N	P	Upstream branches of potential fish-bearing stream crosses corridor and cannot be avoided	P	MAR	P	MAR
PQ9B	Y	S	N	P	Upstream branch of potential fish-bearing stream within boundary that will not be avoided	P	MAR	P	MAR
Q1	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q10	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q11	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q13	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q16	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q19	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q21	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q23	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q24	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q27	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q4	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
Q42	Y	S	N	N	NFB stream crosses corridor and cannot be avoided	N	NFB	N	NFB
Q6	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
QMR2 (Q41)	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A

TABLE A5-4. RESULTS OF QUARRY AND LAYDOWN AREA ACCESS ROAD SCREENING FOR POTENTIAL INTERACTIONS WITH FISH HABITAT
DATE: MAY 1, 2019

New Site ID	Waterbodies Present (Y/N)	Waterbody Type	Can Waterbody Be Avoided (Y/N/P)	Fish Habitat Affected (Y/N/P)	Comments	Fish Habitat Designation			
						Arctic Char		Ninespine Stickleback	
						Y/N/P	Habitat Quality	Y/N/P	Habitat Quality
Rail Sand Pit	N	N/A	N/A	N/A	No waterbodies	N/A	N/A	N/A	N/A
PQ2A	Y	S	N	N	Upper reach of NFB stream cannot be avoided	N	NFB	N	NFB
PQ2	Y	S	N	Y	Crosses lower reaches of two streams that may be fish-bearing and one very large river that will require a bridge to cross and is important habitat	Y	IMP	Y	MAR

N/A = not applicable; P = pond; S = stream; N = No; Y = Yes; P = Potential; NFB = Not fish-bearing; MAR = Marginal; IMP = Important.
Note: As the precise locations of access roads within assigned corridors have not yet been identified, UTM coordinates are undetermined. See Tables A5-2 and A5-3 for UTMs for centroids of laydown and quarry areas.



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

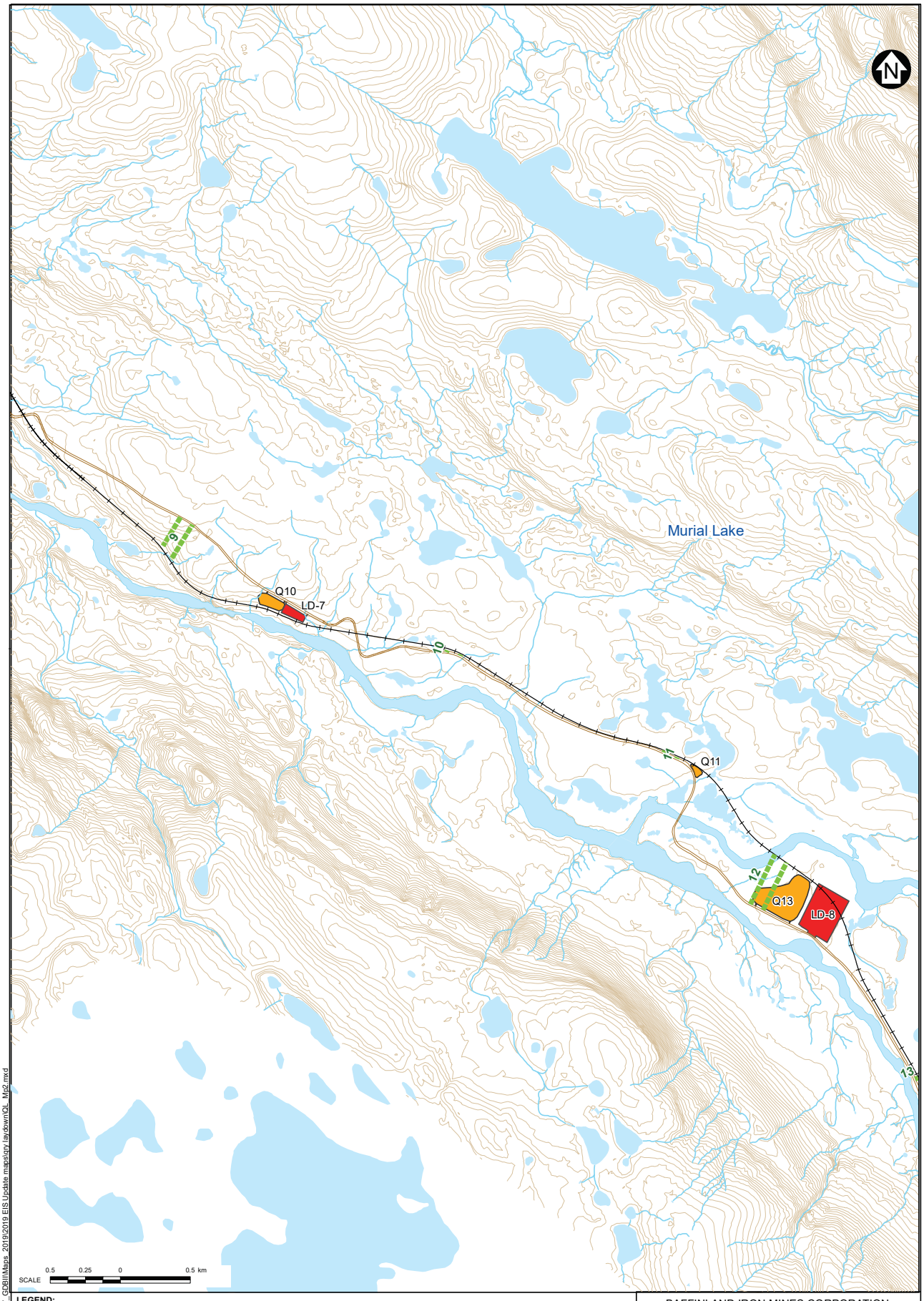
MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 01/05/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps 2019\2019 EIS Update maps\qry layDown\QL_Mp1.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

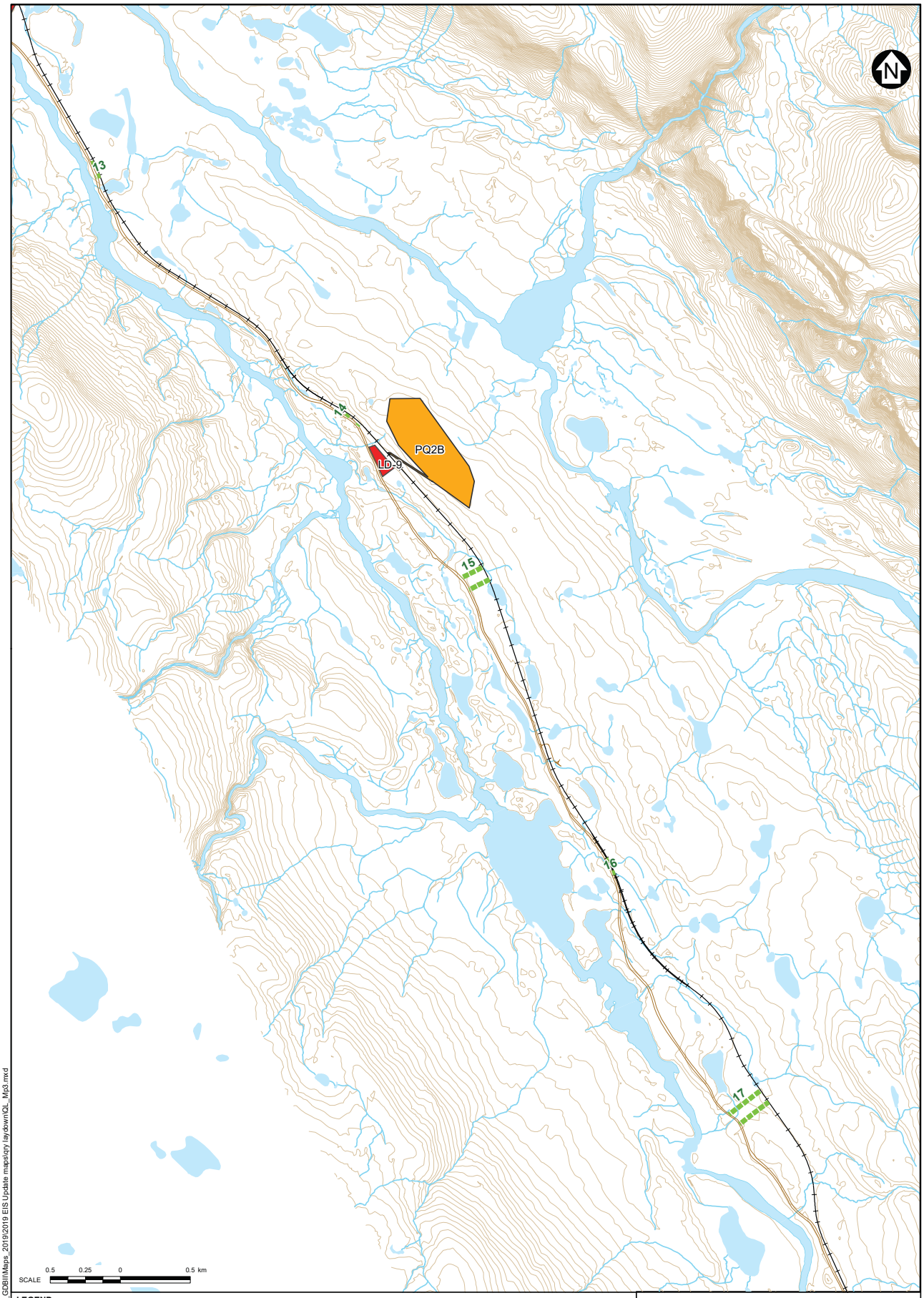
MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 01/05/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps 2019\2019 EIS Update maps\qry layDown\QL_Mp2.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

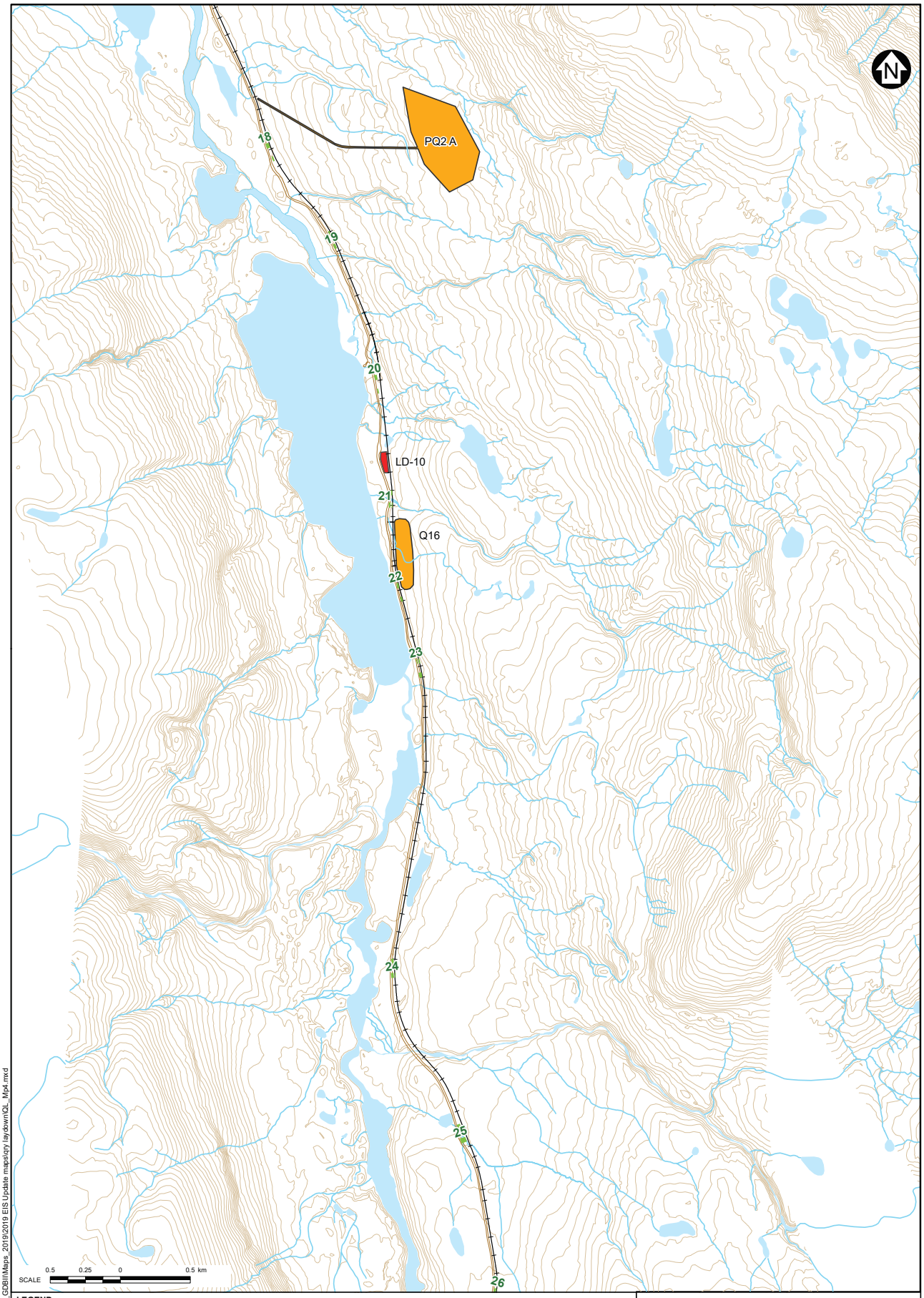
MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 01/05/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\qry laydown\QL_Mp3.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

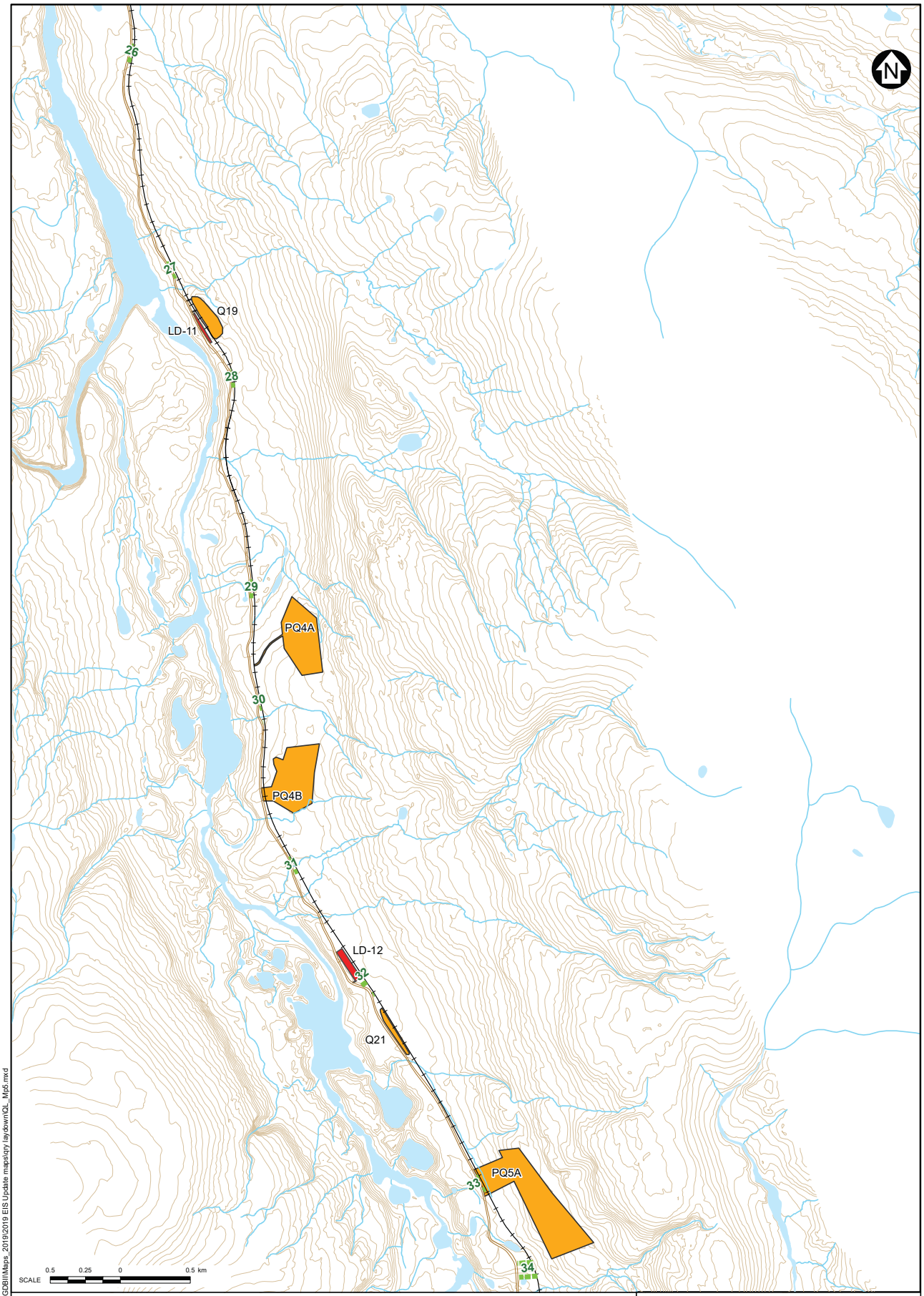
North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 01/05/2019

REV 1

Document Path: J:\MYP\MARYRIV_GDB\IIMaps_2019\2019 EIS Update maps\qry laydown\QL_Mp4.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

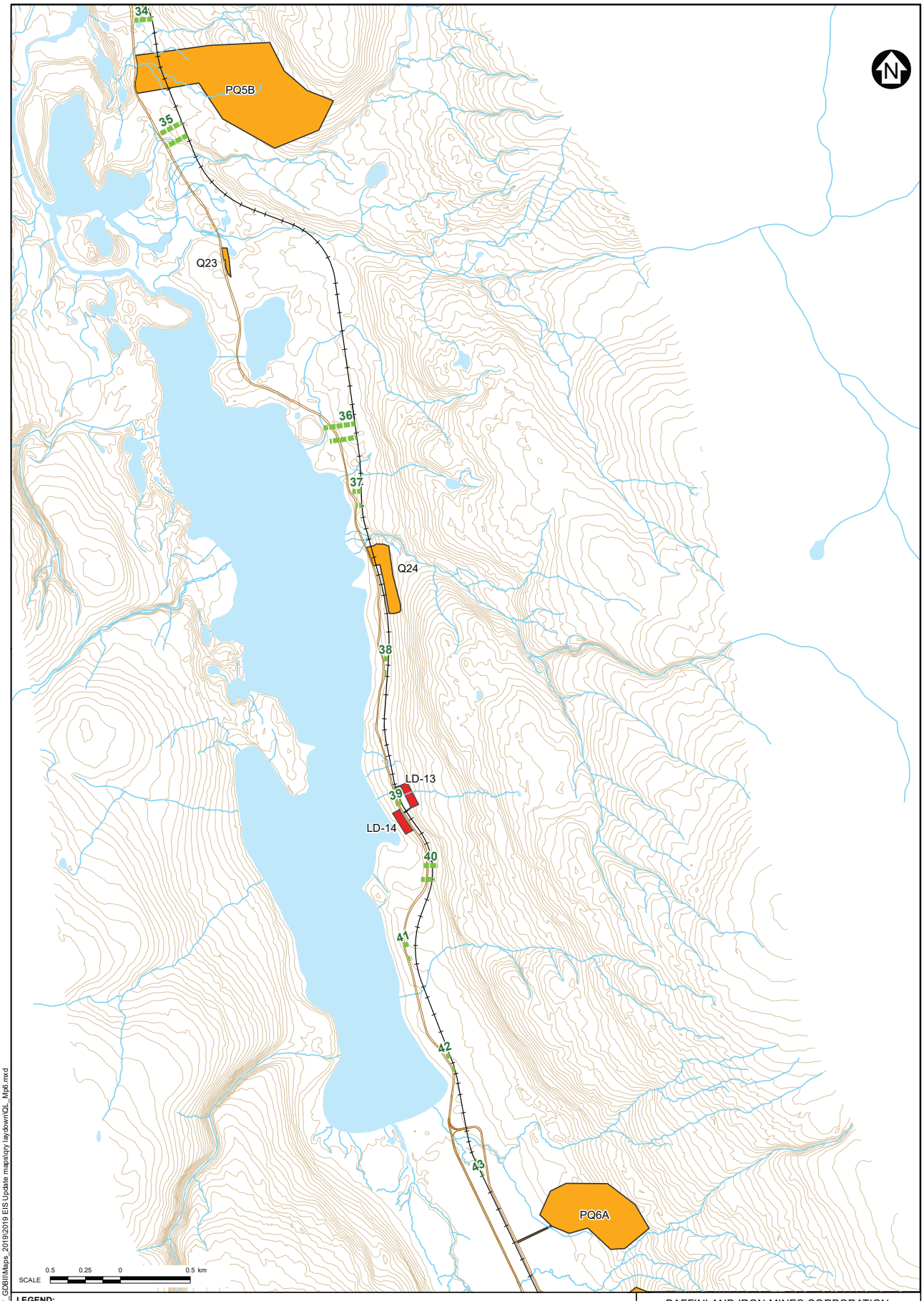
MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 01/05/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IIMaps_2019\2019 EIS Update maps\qry laydown\QL_Mp5.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

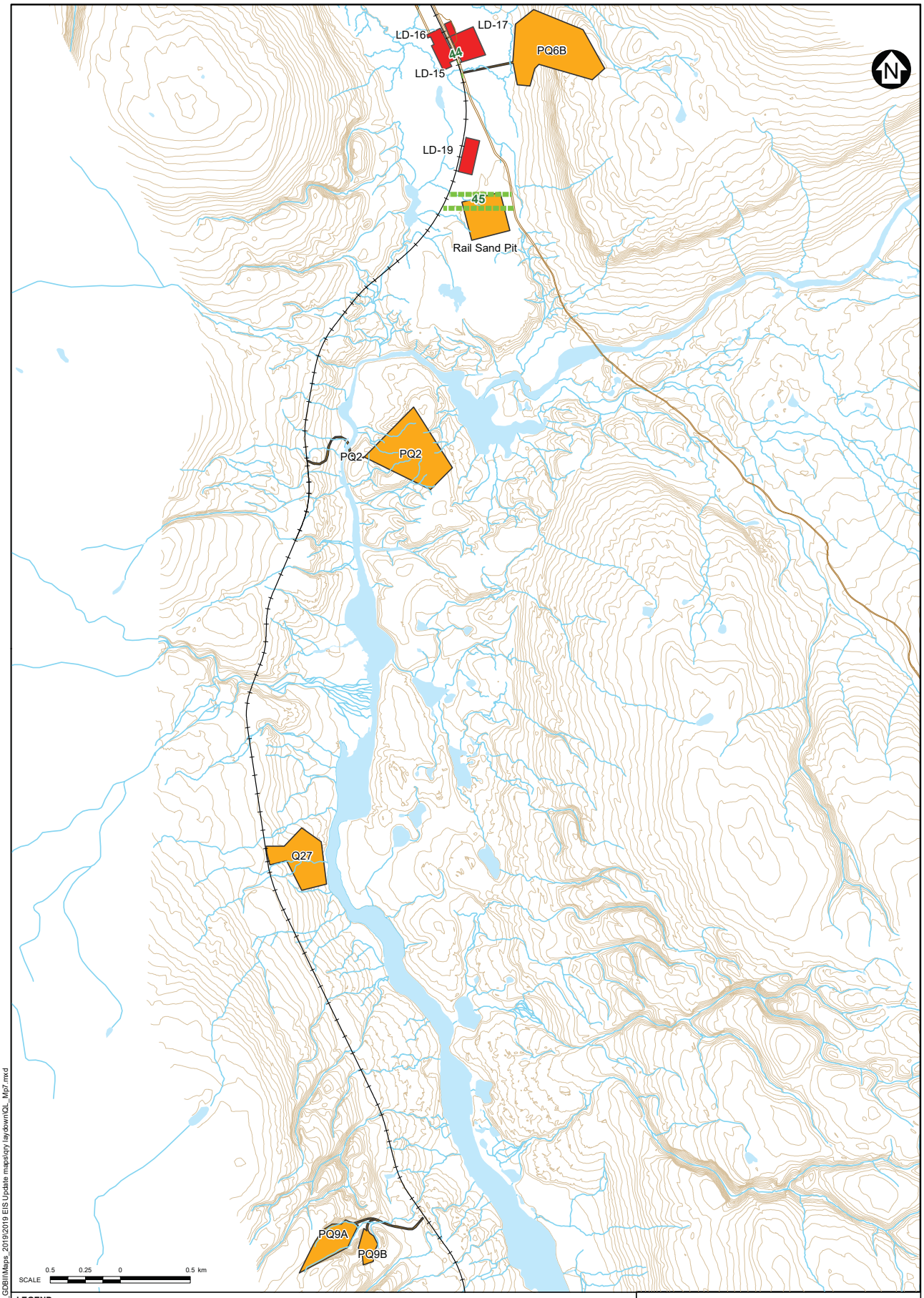
QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 01/05/2019 REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\qry laydown\QL_Mp6.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

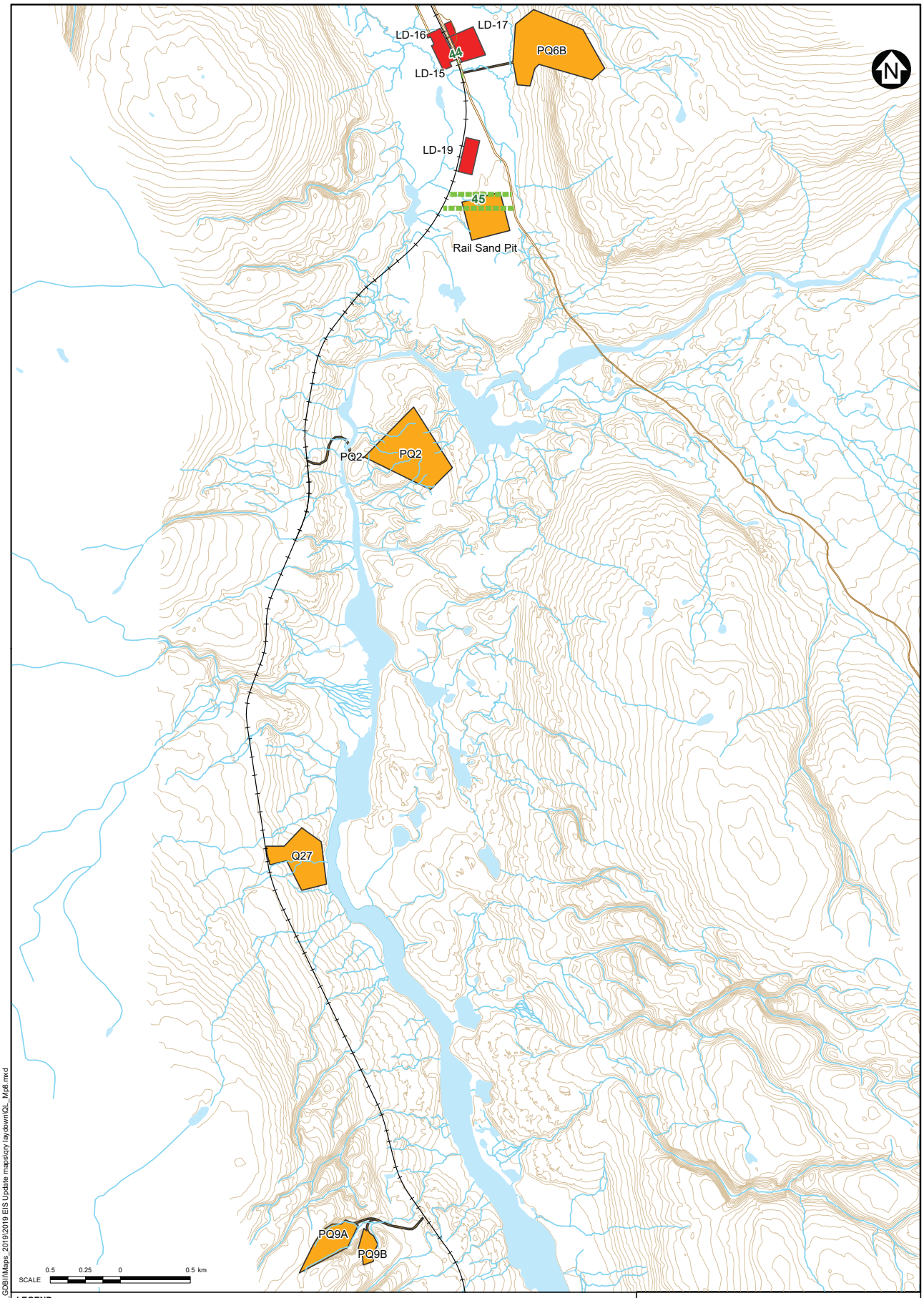
QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-

DATE: 01/05/2019 REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\qry laydown\QL_Mp7.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

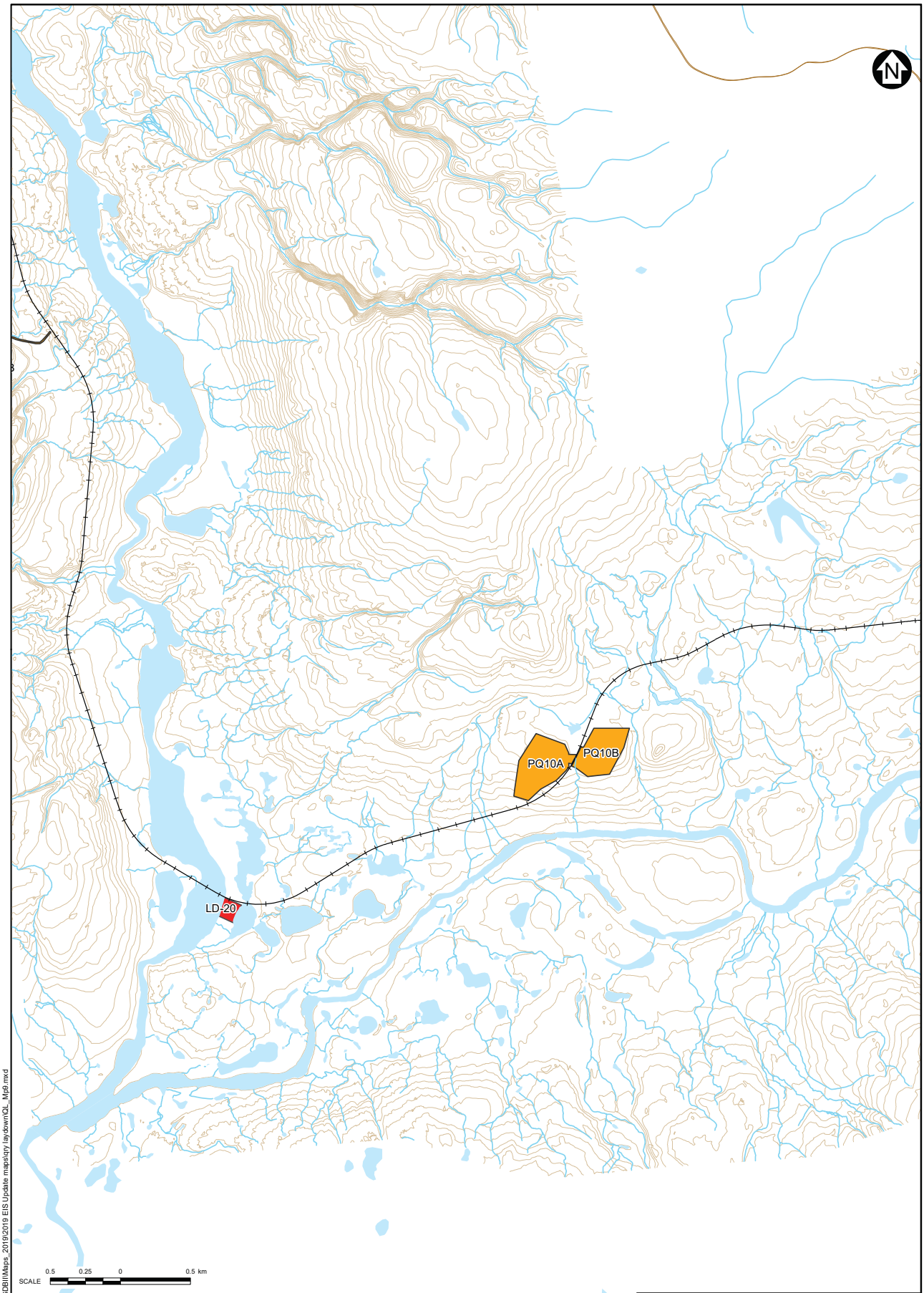
MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 01/05/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IIMaps_2019\2019 EIS Update maps\qry laydown\QL_Mp8.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

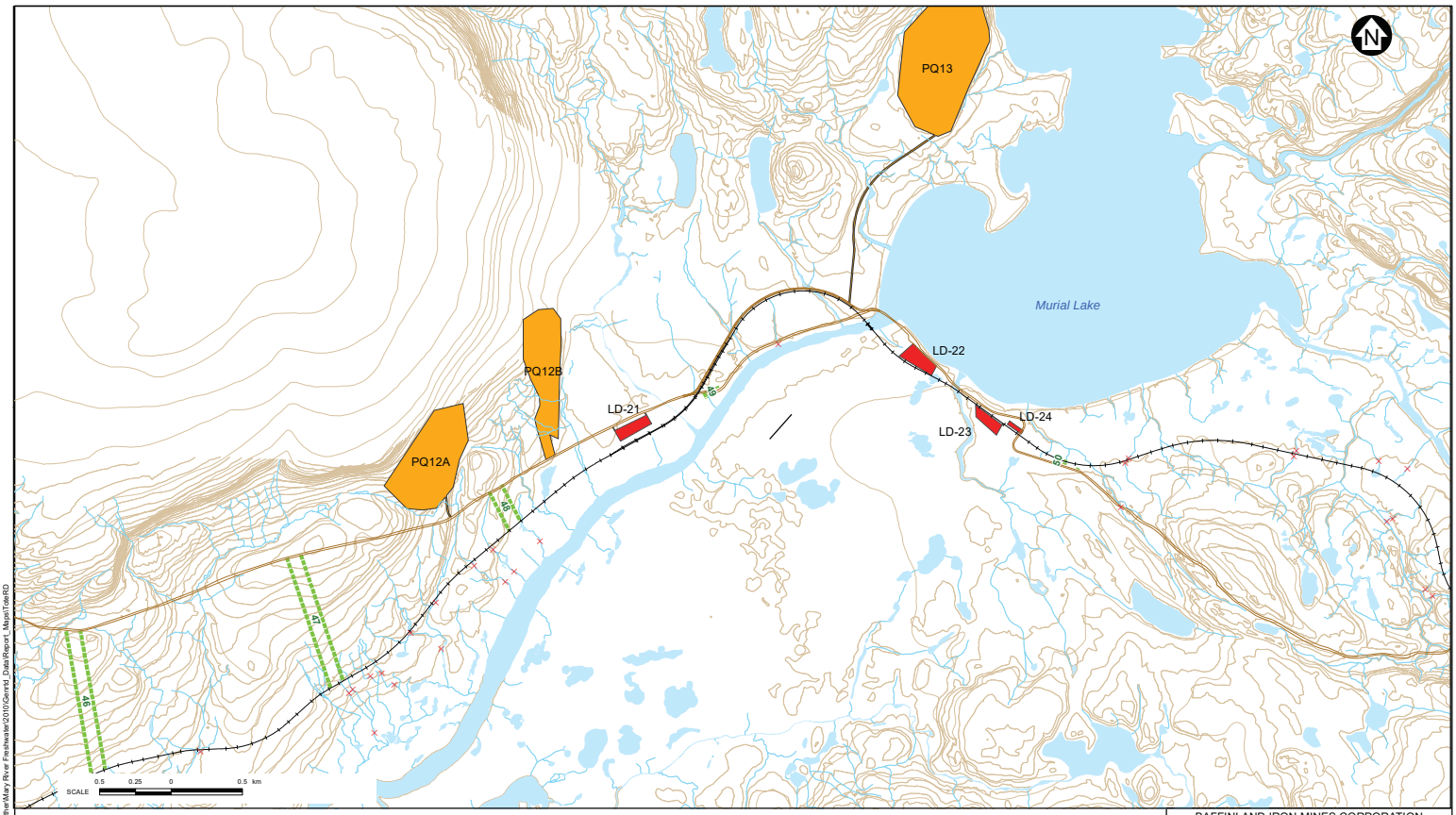
MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

P/A NO.	REF NO.
-	-
DATE: 01/05/2019	REV 1

Document Path: J:\MYP\MARYRIV_GDB\IlMaps_2019\2019 EIS Update maps\qry laydown\QL_Mp9.mxd



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

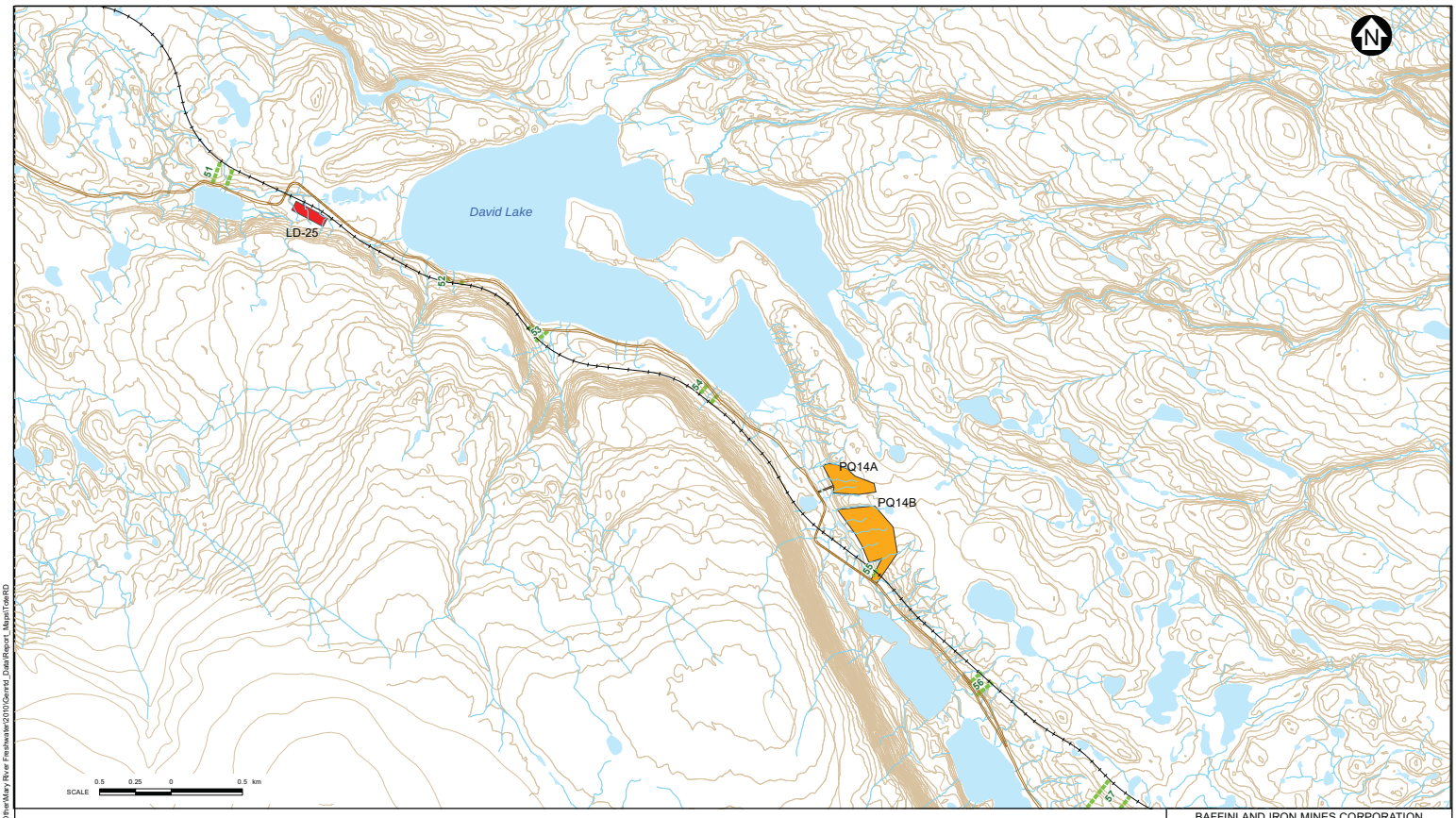
QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.	REF NO.
-	-

DATE: 01/03/2019 REV -

Path: \\terrastation\GIS\Projects\Other\Mary River Freshwater\2010\Gen\fd_Data\Report_Maps\TotePD



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

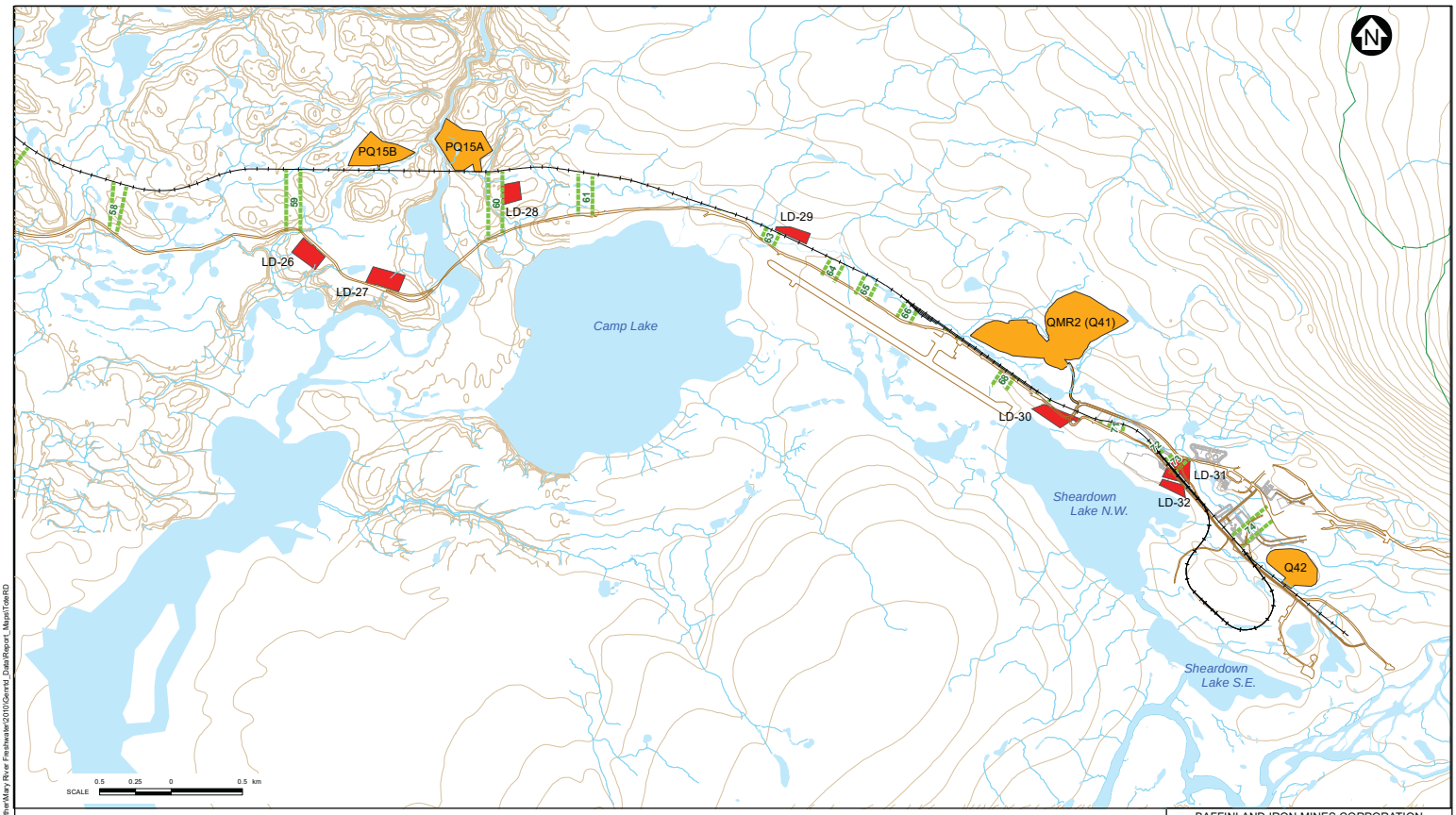
MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.	REF NO.
-	-
DATE: 01/03/2019	REV -

Path: \\terastation\GIS\Projects\Oltne\Mary River Freshwater\2010\Gen\d_Data\Report_Maps\ToteRD



LEGEND:

- QUARRY
- LAYDOWN
- TEMPORARY RAIL ACCESS ROADS
- PROPOSED NORTH RAILWAY
- MILNE INLET TOTE ROAD
- CONTOUR (5M INTERVAL)
- INFRASTRUCTURE
- PERMANENT BARRIER
- SOFT / SEASONAL BARRIER

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009.) ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005)
3. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
4. CONTOUR INTERVAL IS 5 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

QUARRIES, LAYDOWNS AND TEMPORARY ACCESS ROADS

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO. -
REF NO. -
DATE: 01/03/2019
REV -

Path: \\terastation\GIS\Projects\Other\Mary River Freshwater\2010\Gen\fd_Data\Report_Maps\ToteRD