# Baffinland Iron Mines Corporation
# Mary River Project

## Steensby Port and Railway Freshwater Habitat Surveys: 2021-2023

REPORT

Prepared for Baffinland Iron Mines Corporation
By North/South Consultants Inc. · 83 Scurfield Blvd. · Winnipeg, MB · R3Y 1G4

# BAFFINLAND IRON MINES CORPORATION

# MARY RIVER PROJECT

# STEENSBY PORT AND RAILWAY FRESHWATER HABITAT SURVEYS:

# 2021-2023

**Prepared for:**

Baffinland Iron Mines Corporation

**Prepared by:**

North/South Consultants Inc.

**FINAL**

**January 2024**

North/South Consultants Inc.
Aquatic Environment Specialists

83 Scurfield Blvd.
Winnipeg, Manitoba, R3Y 1G4
Website: www.nscons.ca

Tel.: (204) 284-3366
Fax: (204) 477-4173
E-mail: nscons@nscons.ca

# EXECUTIVE SUMMARY

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) to the Nunavut Impact Review Board (NIRB), which presented in-depth analyses and evaluation of potential environmental and socioeconomic effects associated with the Project (Baffinland 2012).

The existing Early Revenue Phase (ERP) operation involves open pit mining of up to 6 million tonnes per annum (Mtpa) of ore and transporting the ore by long-haul trucks to a port facility at Milne Inlet (Milne Port) for shipment during the open-water season.

In 2012, Baffinland received approval for its original 18 Mtpa project that involved a 149-km long railway to a year-round port in Steensby Inlet through the issuance of Project Certificate No. 005 (NIRB 2012).

Baseline field surveys were undertaken in 2021-2023 to provide an updated assessment of potential interactions between Project infrastructure associated with the Steensby Rail and Port and fish habitat, and to assist with final detailed engineering design and mitigation and support an application for a *Fisheries Act Authorization*.

This report presents a summary of results of the field surveys conducted in 2021-2023 along the rail alignment and detailed results of these surveys for fish-bearing waterbodies. Results presented herein reflect detailed engineering design, including the rail alignment, embankments, and crossing designs, for the Steensby Rail (Figure 1), current to November 13, 2023 (provided by Systra), and Steensby Port (Figure 2), current to December 6, 2023 (provided by Ausenco).

Surveys, which consisted of determining presence/absence of the two fish species present in the study area (Arctic Char [*Salvelinus alpinus*] and Ninespine Stickleback [*Pungitius pungitius*]), and conducting habitat assessments, were undertaken at stream crossing, lake/pond encroachment/infill, and bridge crossing sites along the proposed Steensby Railway corridor and in the Steensby Port area. Surveys were undertaken based on Project design details provided in advance of the field programs. Field programs were conducted during two survey periods in the open-water season (June/July and August/September) in each year and most sites were surveyed a minimum of two times.

The objectives of the field programs were to:

- determine the presence/absence of fish in areas where the rail or port infrastructure footprints will interact with freshwater systems;
- collect information on barriers to fish movement in watercourses that would be affected by the rail alignment or port infrastructure footprints; and
- collect information on fish habitat at sites known to, or that may potentially, provide fish habitat.

For sites in waterbodies where barriers were not identified, where barriers were deemed to be potentially seasonal in nature (i.e., intermittent), and/or where a site was previously identified to provide fish habitat (known or potential), fish presence/absence was assessed with backpack electrofishing and visual surveys (where feasible). Aquatic habitat assessments were also completed in the vicinity of the proposed rail and port infrastructure at all sites deemed as known or potential fish habitat.

**Steensby Rail Alignment**

The Steensby Rail interacts with waterbodies (streams, ponds, or lakes) at a total of 322 sites. Of these, 117 were identified as confirmed or potential char habitat and 134 as confirmed or potential stickleback habitat. A total of 187 sites were identified as not-fish bearing and 135 as confirmed or potential fish habitat.

Streams that support Arctic Char that will be crossed by the Steensby Railway are typically perennial or intermittent streams with predominantly gravel and cobble/boulder substrates; in some low-lying areas substrates are predominantly fines. The largest streams (rivers crossed by bridges at the Mary River, Ravn River, the unnamed rivers crossed at BR-137-1 and BR-141-1, and the Cockburn Lake narrows) may provide some summer feeding habitat and serve as movement corridors for adults. All other streams provide summer juvenile rearing habitat only. Juvenile char move into the smaller streams in spring and return to overwintering habitat in fall. The Ravn River and Cockburn Lake narrows crossings may also have sufficient depth to support overwintering. Other than these sites, overwintering and spawning are believed to be restricted to lakes with sufficient depth.

There is one notable exception to this general description of Arctic Char distribution along the railway. An entire sub-catchment (that includes crossings from CV-069-2 to CV-085-2) that is drained by the northwest branch of the Cockburn River contains stickleback but does not appear to have any resident char populations.

Ninespine Stickleback along the Steensby Railway are most widespread and abundant in ponds, wetlands and low-lying, slow-flowing, frequently intermittent/ephemeral streams. These habitats can support rearing of juveniles and feeding and potentially spawning of adults. Some of the larger, deeper ponds may also support stickleback overwintering. The intermittent nature of much of this habitat increases the risk of stranding and associated winterkill for stickleback. Such mortalities have been observed at several sites along the rail but were most common in the mid-rail area.

**Steensby Port Area**

In addition to the rail and combined rail/access road crossings, four culverts will be installed across access road stream crossings and two will be installed on streams beneath the airstrip in the Steensby Port area. Of these, fish are not present at two sites; the remaining four sites are confirmed or potential Arctic Char and Ninespine Stickleback habitat.

The two proposed water intakes at 3 km and 10 km lakes will affect habitat for both species.

Other port infrastructure that will affect waterbodies includes the following:

- the Land Farm is located in a stream/low point area that is not fish habitat; and
- Steensby Island infrastructure will infill freshwater ponds and streams, none of which are fish habitat.

Steensby Island includes five small catchments with approximately 12 small, shallow ponds with silt/organic substrate and a few ephemeral streams. None of these ponds have connectivity to Steensby Inlet and all lack sufficient depth for overwintering.

Habitat in the Steensby Port Area affected by port infrastructure includes many small, coastal watersheds. Generally, the majority of available fish habitat in the Steensby Port Area is lacustrine. There are relatively few large streams, in particular those with a predominance of cobble/riffle habitat. Most of the available fish habitat in the surveyed area can be found in a handful of catchments (ST-02, 04, 05, and 06).

Many of the streams in the port area are not fish-bearing due to a lack of sufficient surface flows and/or connectivity with probable overwintering locations. Of those identified as providing fish habitat, most are characterized by mainly fine substrates. Barriers are present throughout most catchments but are more

common in smaller drainages along the coast. Barriers to fish movement in the area typically consist of steep gradients and/or areas with little to no surface water. The distribution of these barriers and the presence of a large number of streams with limited flow, suggest that fish movements between lakes within the same catchment may be somewhat limited, particularly for Arctic Char. As such, it is suspected that many of the lakes with Arctic Char contain landlocked and isolated populations.

In addition, there appears to be a general lack of connectivity with the marine environment (i.e., barriers to movement or insufficient flows/water levels in streams flowing into Steensby Inlet) in surveyed catchments within the Steensby Port area. Only one lake in the area (Ikpikitturjuaq/10 Km Lake/Lake ST-347) has been identified through Inuit Qaujimajatuqangit (IQ) studies as supporting an anadromous population of char (Baffinland 2012). The extent of anadromous char distribution in the Ikpikitturjuaq catchment is unknown but may include several lakes.

Arctic Char and Ninespine Stickleback were captured/observed throughout the Steensby Port Area. However, stickleback were more widespread and abundant in many catchments. Both species were captured or observed more commonly in lakes than in streams in most watersheds. However, fish were absent from surveyed waterbodies in four of the smallest (≤0.30 $km^2$), coastal, mainland catchments and from all freshwater catchments on the proposed port facility island. Most catchments support both species. However, there are three coastal watersheds (ST-03, 18, and 19) known to support populations of stickleback, but not char. These catchments range in size from approximately 0.4 to 1.0 $km^2$. There are no catchments that support only char.

# TABLE OF CONTENTS

**1.0 INTRODUCTION ..... 1**

**2.0 METHODS ..... 1**

2.1 SCOPE AND OBJECTIVES ..... 1
2.2 FIELD METHODS ..... 1
2.3 FISH HABITAT CLASSIFICATION ..... 5
2.4 FISH HABITAT USE ..... 5
2.5 INFRASTRUCTURE AND CROSSING DESIGN INFORMATION ..... 6

**3.0 RESULTS AND DISCUSSION ..... 6**

3.1 STEENSBY RAILWAY SITES ..... 6
3.2 STEENSBY PORT SITES ..... 7
3.3 OVERVIEW OF FISH AND FISH HABITAT ..... 8
3.3.1 Mary River to Ravn River: km 0 to km 39 ..... 8
3.3.2 Ravn River: km 39 to km 73 ..... 10
3.3.3 Upper Cockburn River Drainage: km 73 to km 91 ..... 11
3.3.4 Cockburn River Drainage: km 91 to km 132 ..... 13
3.3.5 Steensby Inlet Coastal Watersheds: km 132 to Steensby Port ..... 15

**4.0 LITERATURE CITED ..... 18**

# LIST OF TABLES

Table 1. Barrier types and descriptions for Arctic Char. ..... 2
Table 2. Stream morphology units. ..... 5
Table 3. Substrate classes. ..... 5
Table 4. Summary of 2021-2023 Steensby Rail fish habitat field survey results. ..... 7
Table 5. Summary of 2021-2023 Steensby Port fish habitat field survey results. ..... 8

# LIST OF FIGURES

Figure 1. Site map showing the proposed Steensby Railway alignment. ..... 2
Figure 2. Site map showing the proposed Steensby Port layout. ..... 3
Figure 3. Steensby Port area watersheds. ..... 17

# LIST OF PHOTOGRAPHS

Photograph 1. Photo of the Mary River taken near the rail crossing in August 2022. ..... 9
Photograph 2. Photo of rail site CV-006-1 taken near the rail crossing in spring 2022. ..... 9
Photograph 3. Photo of the Ravn River taken near the rail crossing in spring 2022. ..... 10
Photograph 4. Photo of rail site CV-049-2 taken near the rail crossing in spring 2022. ..... 11
Photograph 5. Photograph of one of the sets of falls on the northwest branch of the Cockburn River taken in August 2023. ..... 12
Photograph 6. Photo of rail site CV-076-1 taken near the rail crossing in spring 2022. ..... 13
Photograph 7. Photo of the Cockburn Lake bridge crossing area (BR-095-1) taken in spring 2022. ..... 14
Photograph 8. Photo of a typical stream (BR-096-1) flowing into the east side of Cockburn Lake taken in August 2021. ..... 14

# LIST OF ATTACHMENTS

Attachment 1. List and maps of sites surveyed in freshwater habitat along the Steensby Railway alignment and the Steensby Port: 2021-2023.
Attachment 2. Aquatic habitat assessment sheets for fish-bearing sites surveyed along the Steensby Railway alignment and in the Steensby Port area: 2021-2023.

# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ARCH | Arctic Char |
| B | Boulder/Boulder garden |
| CPUE | Catch-per-unit-effort |
| CSP | Corrugated steel pipe |
| ERP | Early Revenue Phase |
| DO | Dissolved oxygen |
| DS | Downstream |
| FEIS | Final Environmental Impact Statement |
| HG | High gradient |
| IQ | Inuit Qaujimajatuqangit |
| LHB | Left hand bank |
| LP | Low point |
| Mtpa | Million tonnes per annum |
| N | No |
| N/A | Not applicable |
| NIRB | Nunavut Impact Review Board |
| NM | Not measured |
| NNST | Ninespine Stickleback |
| NSC | North/South Consultants Inc. |
| P | Potential |
| RHB | Right hand bank |
| SHALL | Shallow |
| SSF | Subsurface flow |
| US | Upstream |
| UTM | Universal Transverse Mercator |
| VALL | Velocity barrier – all flows |
| VD | Vertical drop |
| VHIGH | Velocity barrier – high flow only |
| Y | Yes |

# 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) to the Nunavut Impact Review Board (NIRB), which presented in-depth analyses and evaluation of potential environmental and socioeconomic effects associated with the Project (Baffinland 2012).

The existing Early Revenue Phase (ERP) operation involves open pit mining of up to 6 million tonnes per annum (Mtpa) of ore and transporting the ore by long-haul trucks to a port facility at Milne Inlet (Milne Port) for shipment during the open-water season.

In 2012, Baffinland received approval for its original 18 Mtpa project that involved a 149-km long railway to a year-round port in Steensby Inlet through the issuance of Project Certificate No. 005 (NIRB 2012).

Baseline field surveys were undertaken in 2021 and 2022 to provide an updated assessment of potential interactions between Project infrastructure associated with the Steensby Rail and Port and fish habitat, and to assist with final detailed engineering design and mitigation and support an application for a *Fisheries Act Authorization*. The results of those surveys were presented in North/South Consultants Inc. (NSC 2023).

Since completion of the 2021 and 2022 field surveys, some changes to the rail alignment have occurred through the detailed design phase. These changes included realignments of several segments of the rail (e.g., to avoid lake encroachments), changes to crossing designs, changes in the rail embankment widths and footprints, and changes to the Steensby Port infrastructure. Field programs were undertaken in 2023 to address gaps in the available baseline information (i.e., due to recent changes in rail design) and survey new waterbodies that would be affected by the latest rail and port design.

The objective of this report is to present a summary of results of field surveys conducted in 2021-2023 along the rail alignment and in the port area and detailed results of these surveys for fish-bearing waterbodies. Results presented herein reflect detailed engineering design, including the rail alignment, embankments, and crossing designs, for the Steensby Rail (Figure 1), current to November 13, 2023 (provided by Systra), and Steensby Port (Figure 2), current to December 6, 2023 (provided by Ausenco).

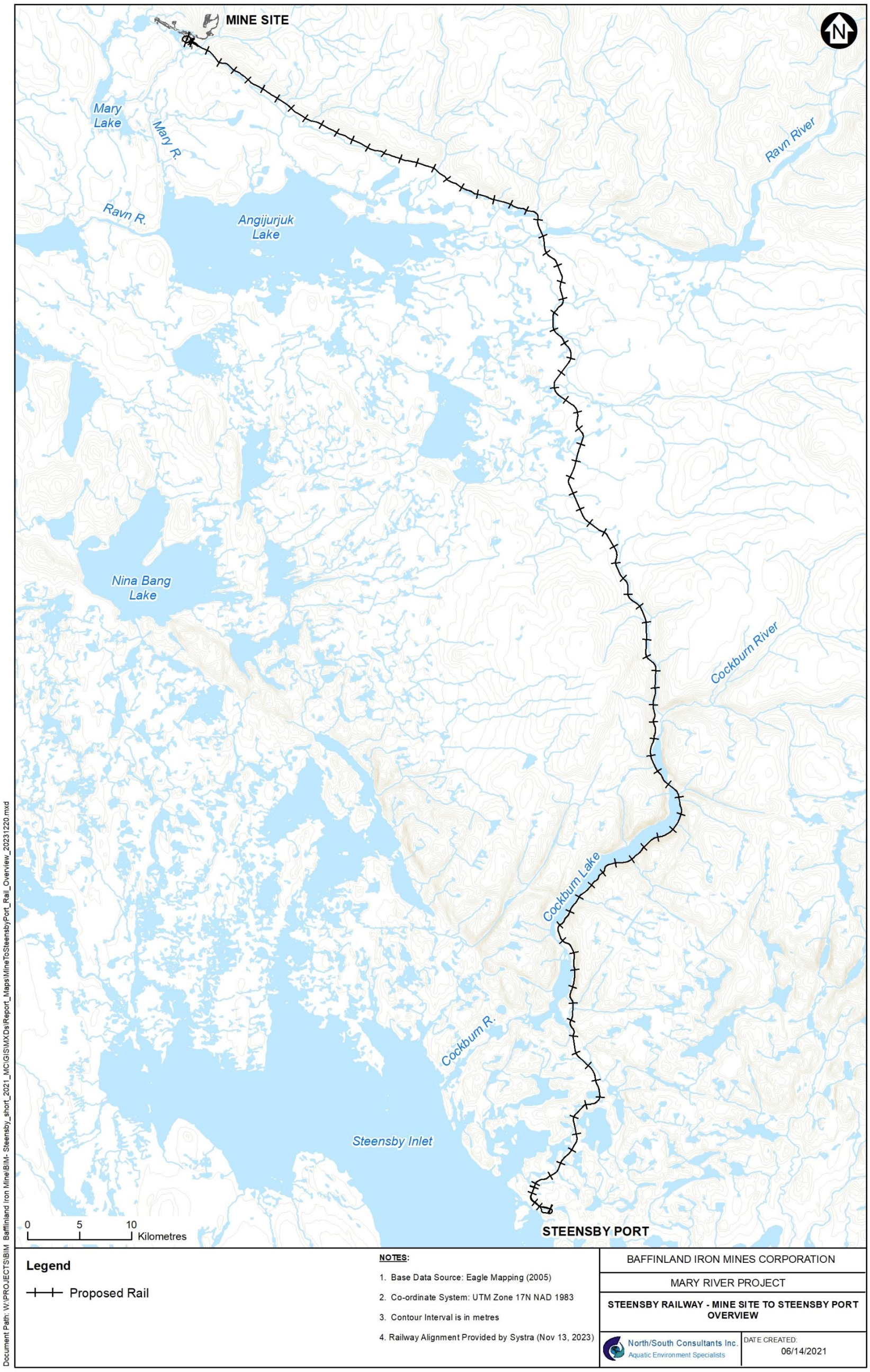



**Figure 1. Site map showing the proposed Steensby Railway alignment.**

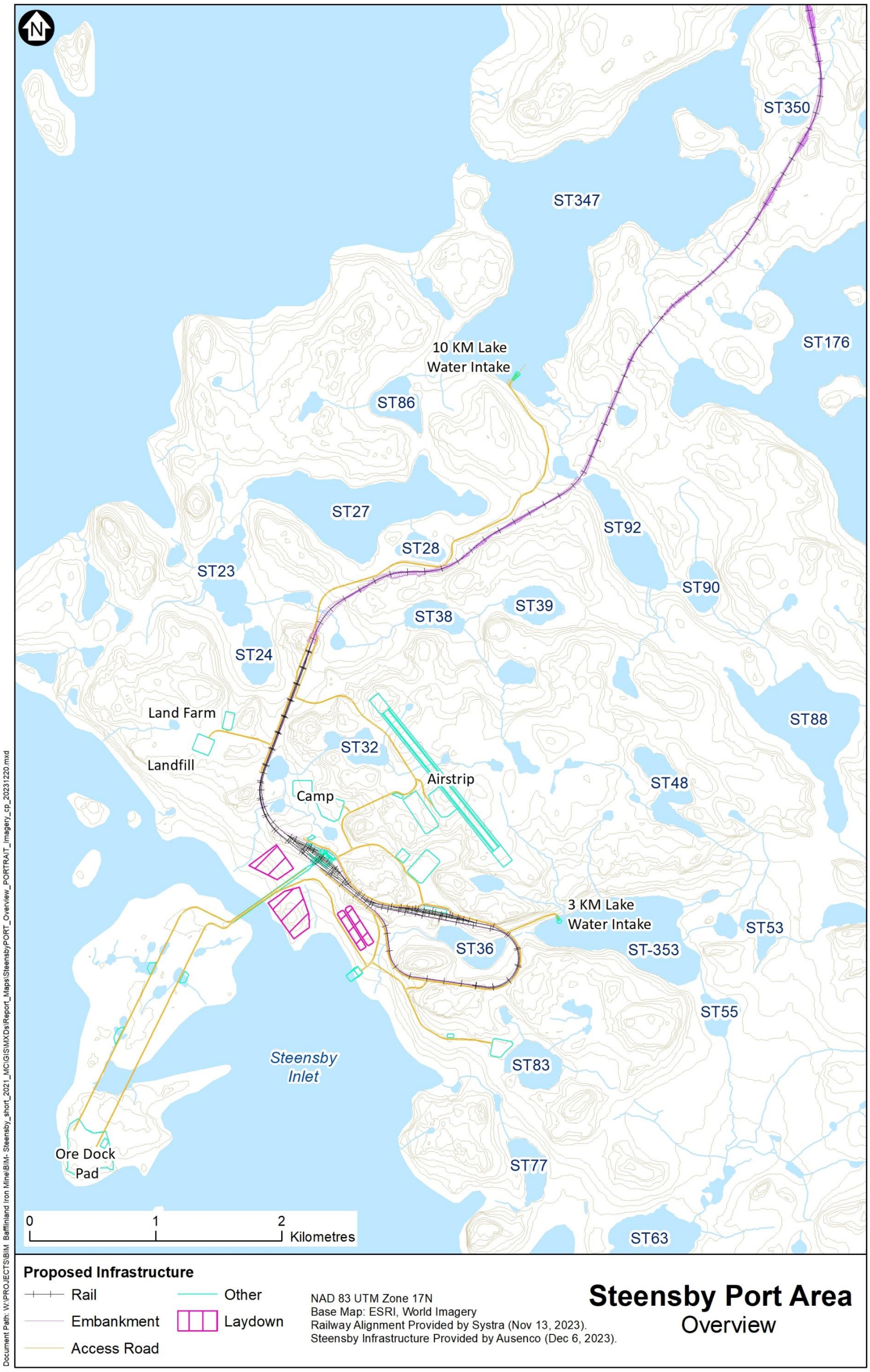



**Figure 2. Site map showing the proposed Steensby Port layout.**

# 2.0 METHODS

The following provides a description of the scope and methods for the field programs conducted in 2021-2023 along the Steensby Railway route and in the Steensby Port area. Surveys, which consisted of determining presence/absence of the two fish species present in the study area (Arctic Char [*Salvelinus alpinus*] and Ninespine Stickleback [*Pungitius pungitius*]), and conducting habitat assessments, were undertaken at stream crossing, lake/pond encroachment/infill, and bridge crossing sites along the proposed Steensby Railway corridor and in the Steensby Port area. Surveys were undertaken based on Project design details provided in advance of, or during, the field programs.

## 2.1 SCOPE AND OBJECTIVES

The objectives of the field programs were to:

- determine the presence/absence of fish in areas where the rail or port infrastructure footprints will interact with freshwater systems;
- collect information on barriers to fish movement in watercourses that would be affected by the rail alignment or port infrastructure footprints; and
- collect information on fish habitat at sites known to, or that may potentially, provide fish habitat.

## 2.2 FIELD METHODS

Two survey periods were undertaken in the open-water seasons of 2021-2023:

- Spring 2021: June 22 to July 7;
- Summer/Fall 2021: August 18 to September 9;
- Spring 2022: June 26 to July 12;
- Summer/Fall 2022: August 4 to 31;
- Spring 2023: June 29 to July 12; and
- Summer/Fall 2023: August 3 to September 6.

Most potential or confirmed fish-bearing sites were surveyed a minimum of two times to obtain information during the early and late open-water season; exceptions occurred for sites located on sections of the rail that were realigned or areas of port infrastructure that were redesigned in August 2023 or after the spring and/or summer/fall program had been completed. Sites identified as not-fish bearing (e.g., sites with permanent barriers to fish movements, lack of connectivity to overwintering habitat) were surveyed during a minimum of one sampling period; additional surveys were conducted to confirm presence of permanent barriers to fish where required.

Sites were assessed through a combination of aerial and ground-based surveys. Aerial surveys were conducted to assess the presence of waterbodies (e.g., assess if a site is a low point or a watercourse), connectivity to overwintering habitat, and to identify potential barriers to fish movement, where required.

All waterbodies were classified as a stream, pond, or in cases where the infrastructure will affect a stream and pond (e.g., near a lake outflow), stream/pond. Project engineers also identified a number of culverts in areas that are not aquatic habitat which were designated as low points. Low points included sites with either no water (i.e., dry) or that were wetted depressions with no evidence of connectivity (channels) to streams or ponds. Sites that were identified as low points were not assessed further and were deemed to be not aquatic habitat (i.e., non-classified drainage).

For all other locations, stream and pond sites were assessed in greater detail to identify or confirm potential fish barriers, conduct aquatic habitat surveys, and assess fish presence/absence. Barrier types were recorded as described in Table 1. Barriers were classified as permanent (i.e., fish passage not possible under a range of flow conditions such as a falls) or intermittent (e.g., subsurface flow present during one sampling period but surface flow present during one or more sampling periods).

**Table 1. Barrier types and descriptions for Arctic Char.**

| Type | Abbreviation | Description | Permanent (PERM) or Intermittent (INT) |
|---|---|---|---|
| Vertical drop/Falls | VD | Barriers with a drop of >0.5 m that could not be passed by juvenile char under all flow conditions. | PERM |
| High gradient | HG | Barriers where the gradient exceeds 10°. Steep gradient provides consistently high velocities that are often combined with low water levels typically over long stretches of habitat. | PERM |
| Boulder/Boulder garden | B | Large boulders blocking the channel such that juvenile char could not pass under all flow conditions. | PERM |
| Velocity barrier – all flows | VALL | Barriers formed in constrictions and/or drops in the channel where high flows (>2 m/s) prevent upstream passage of juvenile char under all flows. | PERM |
| Velocity barrier – high flow only | VHIGH | These barriers are formed when velocity in the stream channel is too high (>2 m/s) to permit upstream movements of all size classes of juvenile char under high flow conditions. The absence of significant constrictions or vertical drops results in reduced velocities under lower flow conditions that may permit fish passage. | INT |
| Insufficient depth | SHALL | Water depth of less than 0.02 m for small juvenile char and 0.2 m for adult fish. | PERM/INT |
| Subsurface flow | SSF | Flow is largely or entirely subterranean and surface water is lacking or of insufficient depth for fish passage. | PERM/INT |
| Other | Other | Headwaters, unconnected pools | PERM/INT |

#### *2.2.1.1 Fishing*

For sites where barriers were not identified, where barriers were deemed to be potentially seasonal in nature (i.e., intermittent), and/or where a site was previously identified to provide fish habitat (known or potential), fish presence/absence was assessed via backpack electrofishing and visual surveys (where feasible). Electrofishing could not be conducted in some instances due to insufficient water (i.e., shallow water) or in other cases, notably in spring 2021, due to persistent ice cover.

In streams, fishing was conducted along a minimum of 100 m of habitat and for a minimum of 100 seconds. Where possible (i.e., where aquatic habitat was present and the waterbody was sufficiently deep to facilitate electrofishing) fishing was conducted a minimum of 50 m downstream to 50 m upstream of the stream crossing centreline (based on the rail design at the time of the surveys), or up to a confluence with a large river or lake/pond (e.g., site CV-142-2) or a permanent barrier to fish. In some instances, electrofishing locations and distances fished were dictated by the presence of water of sufficient depth. Due to changes to the rail design over the course, and following completion, of the field programs, locations of electrofishing varied with reference to the current rail or access road centrelines.

Ponds were fished within the railway encroachment area and if no fish were captured, electrofishing was conducted along additional shoreline for a duration of up to 500 seconds in larger ponds/lakes. For small ponds, electrofishing was conducted along the entire perimeter.

Duration, electrofisher settings, and universal transverse mercator (UTMs) coordinates were recorded for each site. All captured fish were placed in a pail filled with source water and identified to species and measured for fork length (± 1 mm) before being released back into their source waterbodies.

If fish were not captured or observed during surveys, connectivity of the stream/pond with the nearest potential overwintering lake (i.e., lakes with maximum depth >3.0 m) or large river was assessed and any potential natural barriers to fish movement identified. Barriers were described and photographed, UTMs were recorded, and where feasible, physical measurements of barriers (e.g., height of vertical barriers) were collected.

#### *2.2.1.2 Habitat Assessment*

Habitat characteristics were recorded at all sites deemed as known or potential fish habitat as described below.

**Streams**

Stream habitat surveys extended a minimum of 100 m upstream and downstream of the centreline of the crossing, or up to a confluence with a major stream or lake, or where habitat was dry or of insufficient depth to facilitate electrofishing. With few exceptions, detailed habitat information was collected across transects at the rail centreline and at 20 m intervals upstream and downstream of the centreline. As noted for electrofishing, at some sites the locations of habitat assessments (including transects) varied with respect to the current rail centreline due to changes in the rail design following completion of field surveys.

General habitat information collected included:

- Water temperature;
- Stream gradient;
- Stage, defined as: low = 0 – 30%; moderate = 30 – 90%; and high = >90% bankfull;

- Channel confinement: confined; frequently confined; unconfined; or not applicable (e.g., delta at mouth of stream);
- Stream morphology: straight; sinuous; meandering;
- Riparian vegetation: percentage of type (i.e., grass, willow, other, and none); and
- Floodplain: description of the substrate of the dry parts of the channel as the percentage of boulder, cobble, gravel, sand, and fines.

Additional habitat information collected at each of the survey transects included:

- Bankfull width and wetted width (at 25, 50, and 75% across the channel width);
- Water depth (at 25, 50, and 75% across the channel width);
- Velocity (at 25, 50, and 75% across the channel width); and
- Stream morphology (riffle, pool (<0.2 m depth), pool (>0.2 m depth), run, cascade, flat, and rapids; Table 2);
- Substrate composition (Table 3); and
- Percent and type of instream vegetation.

Information on bank characteristics collected at each stream centreline location included:

- Height;
- Stability: high (100%); moderate (>50%); low (<50%): unstable (slumping);
- Materials: percent boulder; cobble/gravel/sand; mineral soil; organic; and
- Shape: vertical; undercut (over water); overhanging (i.e., not over water); or sloping away from water.

Photographs were taken upstream, downstream, and across at each of the transects.

Stream crossing sites that were identified as providing or potentially providing fish habitat were then surveyed farther upstream of the crossing location for barriers to determine the furthest upstream extent of potential fish habitat. Surveys were conducted through a combination of aerial and ground-based surveys.

**Lakes/Ponds**

For lakes/ponds, habitat was assessed in the vicinity of the proposed rail footprints and included assessment of nearshore (from shore to approximately 2-3 m into the pond) and offshore (area beyond 2-3 m from shore) areas; surveys were completed from shore and out to wadeable depth. Information collected included:

- Water temperature;
- Riparian and instream vegetation;
- Substrate type (Table 3); and
- Water depth.

Presence/absence of inflows/outflows, barriers to fish movements, and connectivity to (or lack of) potential overwintering habitat were also noted.

**Table 2. Stream morphology units.**

| Type | | Description |
|---|---|---|
| Riffle | | High velocity/gradient (vs. run), surface broken; shallow (<0.5 m) |
| Rapids | | High velocity, deeper than riffle, coarse substrate |
| Cascade | | High gradient and velocity, extremely turbulent, armoured substrate |
| Run (Glide) | | Moderate to high velocity, surface mostly unbroken, deeper than riffle |
| Flat | | Low velocity, near-uniform flow, differential from a pool by high channel uniformity |
| Pool | >0.2 m | Portion of the channel with increased depth and reduced velocity, formed by channel scour |
| | <0.2 m | |

**Table 3. Substrate classes.**

| Substrate | Size (mm) |
|---|---|
| Fines | <2 |
| Gravel | 2-16 |
| Small cobble | 17-64 |
| Large cobble | 65-256 |
| Boulder | >256 |

## 2.3 FISH HABITAT CLASSIFICATION

Sites were classified as not fish habitat (N), fish habitat (Y), or potential fish habitat (P) for both fish species. Sites classified as not fish habitat for either species included:

- Isolated Waterbodies: Sites that lacked connectivity to overwintering habitat (e.g., isolated shallow pond); and
- Inaccessible Sites: Sites for which permanent barriers to fish were identified during the 2021, 2022, and/or 2023 surveys, or other previous surveys, of the site or downstream area (or upstream area where applicable).

Fish habitat was defined as sites where fish presence has been established through the 2021-2023 (or previous) surveys. Potential fish habitat was defined as sites where fish were not captured or observed in the 2021, 2022, and/or 2023 or any other previous surveys and where no permanent barriers to fish passage were identified. In some instances, sites were deemed to be not fish habitat for one and/or both fish species based on the weight-of-evidence of the field studies which indicate their absence from an entire drainage.

## 2.4 FISH HABITAT USE

Potential habitat uses were identified for each site (spawning, overwintering, rearing, and adults present) for both species. Streams in the study area either dry up or freeze to the bottom each winter. Therefore, overwintering habitat potential for both species, and spawning habitat for char, is limited to ponds/lakes and

potentially, some large rivers. Ponds and streams that are known to be, or that are potentially, used by char or stickleback provide rearing habitat.

The potential for a pond or lake to support spawning or overwintering for char was identified based on measured or estimated maximum depth. Lakes/ponds with maximum depths of less than 3 m were considered to be of insufficient depth to support spawning or overwintering of char, based on an ice thickness of 2 m (maximum ice thickness for north of the tree line; DFO 2010).

Stickleback use a wide range of habitat for spawning but prefer shallow (typically <0.05 m), low flow or stagnant areas with fine substrates and, often aquatic or flooded terrestrial vegetation (Stewart and Watkinson 2004). Ninespine Stickleback males build tubular nests of vegetation and other debris with a string-like kidney secretion as an adhesive, usually over fine substrates in little to no flow. Habitat was conservatively assumed to potentially support spawning in low velocity areas (i.e., pond or marsh habitat) where stickleback were present during the field surveys.

Ponds with maximum depths >2 m were considered to potentially support overwintering of stickleback; this species has less stringent requirements for overwintering, in terms of dissolved oxygen (DO) levels and quantity of habitat, than char. Ninespine Stickleback can tolerate very low DO conditions, which is thought to be a key biological attribute for facilitating successful survival in shallow Arctic lakes (e.g., Haynes et al. 2014). The minimum depth utilized (i.e., >2 m) is relatively conservative as it assumes sufficient water/habitat is present in ponds where the maximum depth exceeds an ice thickness of 2 m (i.e., that these ponds would contain a sufficient volume of water and oxygen to support fish over winter in unfrozen refugia). Haynes et al. (2014) considered lakes with no overwintering potential for Ninespine Stickleback to be those with 0% of the lake area greater than 2 m in depth. Stickleback may disperse to lakes with no overwintering potential in the open-water season, but the lakes cannot sustain populations over winter.

### 2.5 INFRASTRUCTURE AND CROSSING DESIGN INFORMATION

Steensby railway drawings and crossing design details including culvert length, number of barrels, and diameter, bridge spans and length of spans, slope, and catchment areas were provided by Systra Canada Inc. (Systra). Drawings and culvert design information associated with Steensby Port infrastructure were provided by Ausenco.

## 3.0 RESULTS AND DISCUSSION

### 3.1 STEENSBY RAILWAY SITES

The Steensby Rail interacts at a total of 322 sites in waterbodies (streams, ponds, or lakes; Table 4). Of these, 117 were identified as confirmed or potential char habitat and 134 as confirmed or potential stickleback habitat. A total of 187 sites were identified as not-fish bearing. Fish habitat designations for waterbody sites surveyed over the 2021-2023 field surveys are provided in Attachment 1. Habitat assessment sheets for fish-bearing sites along the proposed rail alignment are provided in Attachment 2 (total of 135 sites).

Streams that support Arctic Char that will be crossed by the Steensby Railway are typically perennial or intermittent streams with predominantly gravel and cobble/boulder substrates; in some low-lying areas substrates are predominantly fines. The largest streams (rivers crossed by bridges at the Mary River, the Ravn River, the unnamed rivers crossed at BR-137-1 and BR-141-1, and the Cockburn Lake narrows) may provide some summer feeding habitat and serve as movement corridors for adults. All other streams

provide summer juvenile rearing habitat only. Juvenile char move into the smaller streams in spring and return to overwintering habitat in fall. The Ravn River and Cockburn Lake narrows crossings may also have sufficient depth to support overwintering. Other than these sites, overwintering and spawning are believed to be restricted to lakes with sufficient depth.

There is one notable exception to this general description of Arctic Char distribution along the railway. An entire sub-catchment (that includes crossings from CV-069-2 to CV-085-2) that is drained by the northwest branch of the Cockburn River contains stickleback no Arctic Char. See Section 3.3.3 for a description of this area.

Ninespine Stickleback along the Steensby Railway are most widespread and abundant in ponds, wetlands and low-lying, slow-flowing, frequently intermittent/ephemeral streams. These habitats can support rearing of juveniles and feeding and potentially spawning of adults. Some of the larger, deeper ponds may also support stickleback overwintering. The intermittent nature of much of this habitat increases the risk of stranding and associated winterkill for stickleback. Such mortalities have been observed at several sites along the rail but were most common in the mid-rail area.

**Table 4. Summary of 2021-2023 Steensby Rail fish habitat field survey results.**

| Fish Habitat Designation | Number of Sites |
|---|---|
| Artic Char - Total | 117 |
| Artic Char - Only | 1 |
| Ninespine Stickleback - Total | 134 |
| Ninespine Stickleback - Only | 18 |
| Artic Char + Ninespine Stickleback | 116 |
| Total Fish-Bearing Sites | 135 |
| Not Fish-Bearing | 187 |
| Total Sites | 322 |

## 3.2 STEENSBY PORT SITES

In addition to the rail and combined rail/access road crossings, four culverts will be installed across access road stream crossings and two will be installed on streams beneath the airstrip in the Steensby Port area. Of these, fish are not present at two sites; the remaining four sites are confirmed or potential Arctic Char and Ninespine Stickleback habitat.

The two proposed water intakes at 3 km and 10 km lakes will affect habitat for both species.

Other port infrastructure that will affect waterbodies includes the following:

- the Land Farm is located in a stream/low point area that is not fish habitat; and
- Steensby Island infrastructure will infill freshwater ponds and streams, none of which are fish habitat.

Steensby Island includes five small catchments with approximately 12 small, shallow ponds with silt/organic substrate and a few ephemeral streams. None of these ponds have connectivity to Steensby Inlet and all lack sufficient depth for overwintering.

Fish habitat designations for waterbody sites surveyed over the 2021-2023 field surveys is provided in Attachment 1. Habitat assessment sheets for fish-bearing sites in the Steensby Port area are provided in Attachment 2 (total of 6 sites).

**Table 5. Summary of 2021-2023 Steensby Port fish habitat field survey results.**

| Fish Habitat Designation | Number of Sites |
|---|---|
| Artic Char - Total | 6 |
| Artic Char - Only | 0 |
| Ninespine Stickleback - Total | 6 |
| Ninespine Stickleback - Only | 0 |
| Artic Char + Ninespine Stickleback | 6 |
| Total Fish-Bearing Sites | 6 |
| Not Fish-Bearing | 3 |
| Total Sites | 9 |

## 3.3 OVERVIEW OF FISH AND FISH HABITAT

### 3.3.1 Mary River to Ravn River: km 0 to km 39

Streams within the first 39 km of the proposed rail alignment largely originate at high elevation along a plateau to the north of the rail centreline, flowing down hills towards one of two larger river systems (the Mary and Ravn rivers). Streams crossed by the rail alignment from the Mary River to km 5.5 are within the Mary River/Mary Lake sub-catchment. Streams from km 5.5 to the Ravn River are within the Ravn River/Angijurjuk Lake catchment. There are several potential overwintering lakes within a relatively short swimming distance of most crossings in this area.

Most of the streams in this area have moderate to high gradients often creating barriers to fish movements. Riffles, cascades, and rapids are common, particularly in the larger streams, and substrates are predominantly coarse material (large cobble/boulder) except for a few low-lying crossings near the larger downstream lakes. Streams in this stretch are consistently the last along the Steensby Railway to become snow/ice-free and begin flowing during spring. Both fish species are present in this area, but Arctic Char are more abundant and widespread in streams crossed by the rail. Ninespine Stickleback are uncommon and mainly restricted to ponds/lakes and the lower reaches of these streams where average velocities are lower.

**Photograph 1. Photo of the Mary River taken near the rail crossing in August 2022.**

**Photograph 2. Photo of rail site CV-006-1 taken near the rail crossing in spring 2022.**

### 3.3.2 Ravn River: km 39 to km 73

The mid-rail area, from the Ravn River to km 73, consists of waterbodies within the Ravn River/Angijurjuk Lake catchment. Terrain in this area is low-relief resulting in a large number of small, shallow ponds, wetlands, and slow-moving streams with poor channel definition and silt/organic substrates. There is typically substantive overland flooding in spring as snow melts, creating intermittent connectivity among many of the waterbodies.

Both fish species are present in this area, but Ninespine Stickleback are far more abundant and widespread. Arctic Char prefer deeper, faster-flowing streams with coarse substrates or deeper lakes; habitats that are uncommon along this stretch of the rail alignment. Stickleback prefer the shallow, well-vegetated, slow-flowing streams and ponds, and can often be found several kilometres from assumed overwintering habitat. Stickleback use this habitat for rearing/feeding and potentially spawning during the open-water season. However, due to the intermittent connectivity characteristic of many of the streams and ponds in this area, there is a high risk of natural stranding as water levels recede following the spring freshet. Many dead stickleback were observed during spring site visits that had clearly become stranded the previous fall and were unable to return to overwintering habitat (deeper lakes/ponds).

**Photograph 3. Photo of the Ravn River taken near the rail crossing in spring 2022.**

**Photograph 4. Photo of rail site CV-049-2 taken near the rail crossing in spring 2022.**

### 3.3.3 Upper Cockburn River Drainage: km 73 to km 91

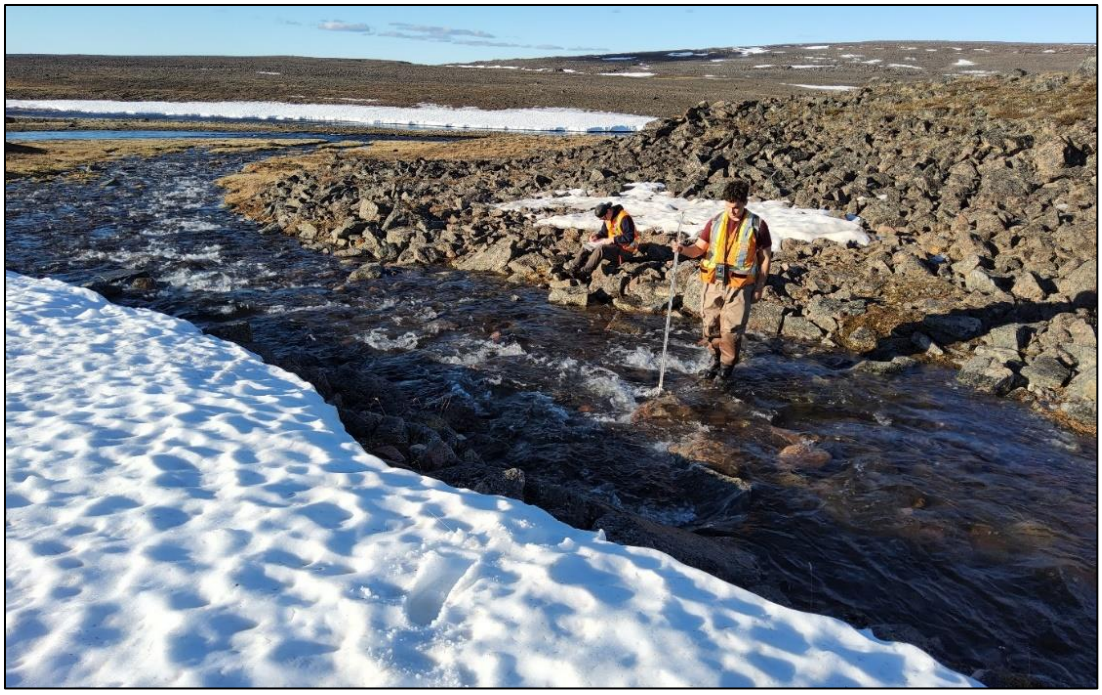
This section of the rail alignment crosses streams that flow into the northwest branch of the upper Cockburn River. Most of the streams in this area have moderate to high gradient as the flow originates from high elevation areas to the west of the northwest Cockburn River. Stream habitat is largely riffle/cascade with coarse substrates. Gradient barriers to fish are common, and many streams have intermittent flows only during freshet, before drying up in summer/fall. A notable feature of the entire sub-catchment that is drained by the northwest branch of the Cockburn River is the near total absence of lakes that could support overwintering and spawning for Arctic Char, and access from Cockburn Lake is precluded by several cataracts and high waterfalls located approximately 3.5 km north of the lake's north basin. The implication is that Arctic Char are absent from this sub-catchment, despite the presence of an abundance of suitable stream habitat. The only potential overwintering refuge and spawning area is an approximately 31 ha lake (km 81 Lake) located along the tributary mainstem between km 84 and km 86 of the rail. This lake was surveyed in 2008 and it was determined that much of it is shallow, although the central basin has depths approaching 20 m. This would be adequate to support overwintering for Arctic Char, and their absence indicates the species never colonized this drainage.

The Steensby Railway alignment interacts with 47 streams/ponds in this sub-catchment upstream of the falls. All of these waterbodies that are capable of supporting fish (i.e., suitable habitat with access from the northwest Cockburn River) have been surveyed a minimum of three times between the earlier FEIS field studies (2007-2011) and the recent field studies (2021-2023). Surveys have been conducted during various seasons and under low and high flow conditions. Char have never been observed or captured in any of

these waterbodies. In addition, the absence of char from km 81 Lake was confirmed in 2010 through an extensive shoreline electrofishing survey which failed to catch any.

Ninespine Stickleback are present in this sub-catchment, likely overwintering in km 81 Lake. However, the fast-flowing rocky habitat present in many of the streams crossed by the rail generally limits their distribution to the lower reaches of these streams, near the confluence with the northwest Cockburn River, and the northwest Cockburn River itself.

**Photograph 5. Photograph of one of the sets of falls on the northwest branch of the Cockburn River taken in August 2023.**



**Photograph 6. Photo of rail site CV-076-1 taken near the rail crossing in spring 2022.**

### 3.3.4 Cockburn River Drainage: km 91 to km 132

Waterbodies along the rail alignment from km 91 to km 132 are part of the Cockburn Lake/Cockburn River catchment. Most streams in this section originate at high elevation from cliffs on either side of Cockburn Lake/River. Streams are frequently very high gradient with mainly cascade/boulder habitat and permanent barriers to fish movements are common.

Both species are present in the catchment, but the frequency of barriers and habitat type limits their distribution, particularly for stickleback. Most fish habitat in this area is found in the Cockburn Lake/River itself and some alluvial fan habitat in a large tributary stream at the southernmost end of Cockburn Lake where the surrounding terrain is lower relief.

**Photograph 7. Photo of the Cockburn Lake bridge crossing area (BR-095-1) taken in spring 2022.**

**Photograph 8. Photo of a typical stream (BR-096-1) flowing into the east side of Cockburn Lake taken in August 2021.**

### 3.3.5 Steensby Inlet Coastal Watersheds: km 132 to Steensby Port

Waterbodies along the rail alignment from km 132 to its terminus at the Steensby Port site are mostly in small, coastal watersheds. There are several lakes in this area with suitable depths for overwintering. Most of these small watersheds contain at least one potential overwintering lake. Waterbodies crossed or encroached by the Steensby Railway range from small, slow-flowing streams to shallow ponds to large, wide, rocky rivers. Both fish species are widespread and abundant in this section of the rail alignment.

Habitat in the Steensby Port Area affected by port infrastructure includes many small, coastal watersheds. Generally, the majority of available fish habitat in the Steensby Port Area is lacustrine. There are relatively few large streams, in particular those with a predominance of cobble/riffle habitat. Most of the available fish habitat in the surveyed area can be found in a small number of catchments (ST-02, 04, 05, and 06; Figure 3).

Nearshore substrates in many of the lakes in the surveyed area are predominantly gravel or smaller in size. The number of lakes with significant proportions of cobble or larger substrates in nearshore areas is contrastingly smaller. Most catchments on the mainland have at least one lake with apparently sufficient depth to provide overwintering habitat for both fish species. However, none of the freshwater waterbodies on Steensby Island have sufficient depth to provide overwintering habitat and there is no freshwater fish habitat.

Many of the streams in the port area are not fish-bearing due to a lack of sufficient surface flows and/or connectivity with probable overwintering locations. Of those identified as providing fish habitat, most are characterized by mainly fine substrates. Barriers are present throughout most catchments but are more common in smaller drainages along the coast. Barriers to fish movement in the area typically consist of steep gradients and/or areas with little to no surface water. The distribution of these barriers and the presence of a large number of streams with limited flow, suggest that fish movements between lakes within the same catchment may be somewhat limited, particularly for Arctic Char. As such, it is suspected that many of the lakes with Arctic Char contain landlocked and isolated populations.

In addition, there appears to be a general lack of connectivity with the marine environment (i.e., barriers to movement or insufficient flows/water levels in streams flowing into Steensby Inlet) in surveyed catchments within the Steensby Port area. Only one lake in the area (Ikpikitturjuaq/10 Km Lake/Lake ST-347) has been identified through Inuit Qaujimajatuqangit (IQ) studies as supporting an anadromous population of char (Baffinland 2012). The extent of anadromous char distribution in the Ikpikitturjuaq catchment is unknown but may include several lakes. The streams connecting three upstream lakes (Lakes ST-352, ST-176, and ST-349) to Ikpikitturjuaq Lake are large enough to support adult char use and had no seasonal or permanent barriers to fish movements when surveyed in spring and late summer/fall 2021. Strontium analyses of char otoliths from the two larger lakes (Lakes ST-352 and ST-176) upstream of Ikpikitturjuaq Lake in 2021 did not provide any evidence of anadromy; however, without direct comparisons to strontium concentrations from both fish and ambient water chemistry from the nearest downstream marine habitat, anadromy cannot be completely dismissed (NSC 2022).

Other catchments in the Steensby Port area lack connectivity to the ocean (e.g., stream that will be crossed by a rail bridge at site CV-144) except at high tide. During low tide, the lower reaches of these coastal streams are unchannelized with diffuse flows among the gravel and cobble shorelines of Steensby Inlet. Water levels in these streams are never sufficient to support the use of adult char and any movements between the marine and freshwater environments would be restricted to amphidromous movements of juveniles. Ninespine Stickleback may follow similar movement patterns in these coastal areas.

Arctic Char and Ninespine Stickleback were captured/observed throughout the Steensby Port area. However, stickleback were more widespread and abundant in many catchments. Both species were captured or observed more commonly in lakes than in streams in most watersheds. However, fish were absent from surveyed waterbodies in four of the smallest (≤0.30 $km^2$), coastal, mainland catchments and from all freshwater catchments on the proposed port facility island.

Most catchments support both species. However, there are three coastal watersheds (ST-03, 18, and 19) known to support populations of stickleback but not char. These catchments range in size from approximately 0.4 to 1.0 $km^2$. There are no catchments that support only char.

The broader distribution of stickleback relative to Arctic char in many Steensby watersheds may be related to the predominance of fine substrates, low flow/lack of permanent connectivity, and, in some areas, low DO levels. Many of these areas are suitable for multiple life history stages of stickleback, allowing them to disperse among waterbodies more easily, but limit movements and survival of Arctic char, which prefer larger substrate sizes and higher flows.

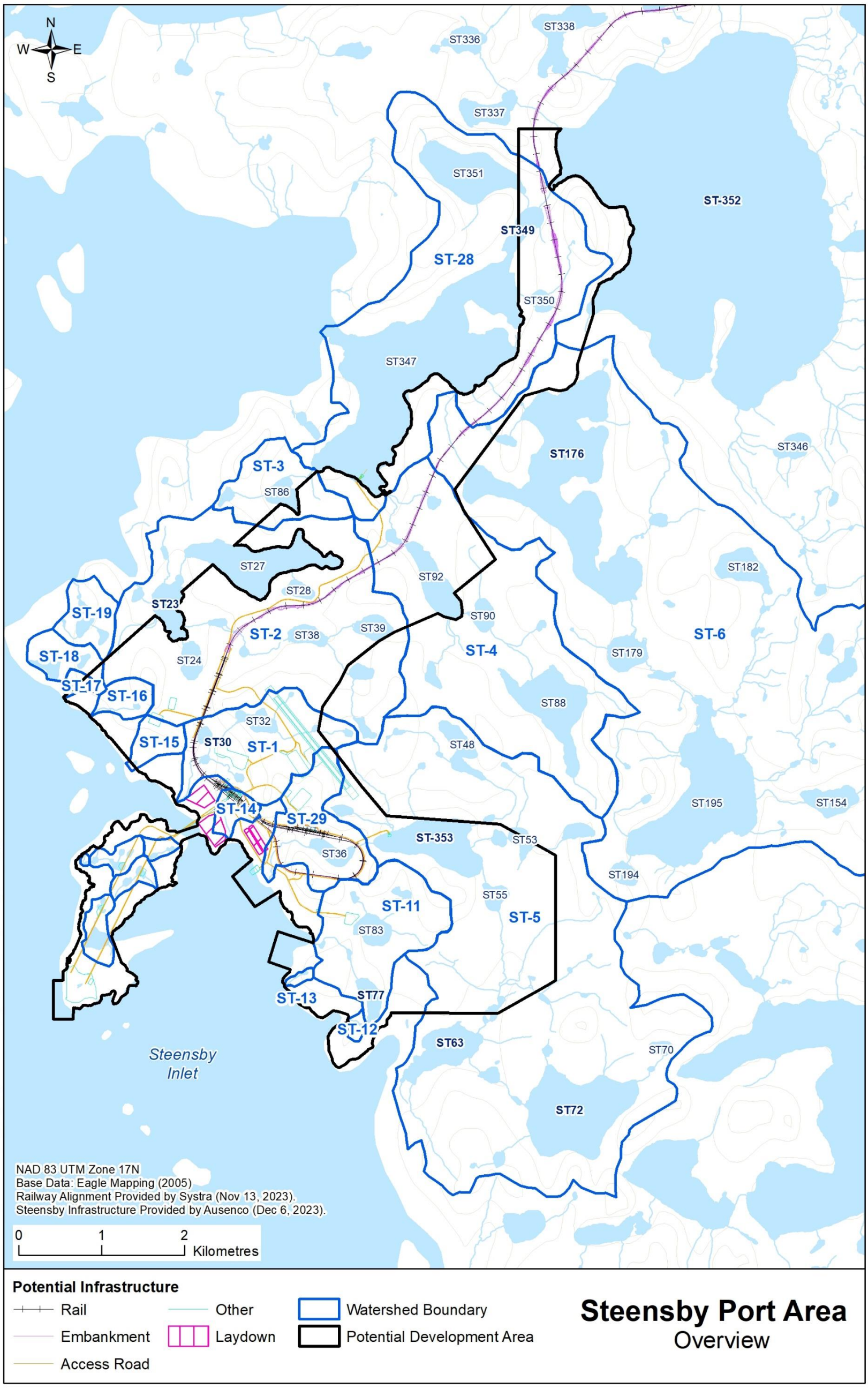



**Figure 3. Steensby Port area watersheds.**

# 4.0 LITERATURE CITED

Baffinland. 2012. Mary River Project - Final Environmental Impact Statement. February 2012.

Department of Fisheries and Oceans (DFO). 2010. DFO protocol for winter water withdrawal from ice-covered waterbodies in the Northwest Territories and Nunavut. June 21, 2010. 3 p.

Haynes, T.B., Rosenberger, A.E., Lindberg, M.S., Whitman, M., and Schmutz, J.A. 2014. Patterns of lake occupancy by fish indicate different adaptations to life in a harsh Arctic environment. Freshwat. Biol 59: 1884-1896.

North/South Consultants Inc. (NSC). 2023. Baffinland Iron Mines Corporation Mary River Project Steensby railway freshwater habitat surveys: 2021-2023. Prepared for Baffinland Iron Mines Corporation, July 2023.

NSC. 2022. Mary River Project: Steensby Port Arctic Char otolith analysis. Technical Memorandum prepared for Baffinland Iron Mines Corporation, February 2022. 16 p.

Nunavut Impact Review Board. 2012. In the matter of the Nunavut Land Claims Agreement, Nunavut Land Claims Agreement Act, S.C., 1993, c. 29 Article 12, Part 5 And In the matter of an application by Baffinland Iron Mines Corporation for development of the Mary River Project Proposal in the Qikiqtani Region of Nunavut - NIRB Project Certificate No. 005. December 28.

Stewart and Watkinson. 2004. The Freshwater Fishes of Manitoba. University of Manitoba Press, Winnipeg, MB. 276 pp.

**Attachment 1. List and maps of sites surveyed in freshwater habitat along the Steensby Railway alignment and Steensby Port: 2021-2023.**

**Table A-1. List and fish habitat designations of sites surveyed in freshwater habitat along the Steensby Railway alignment and Steensby Port: 2021-2023.**

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| MCV-2-2 | MCV-2-2 | Stream | Culvert | Rail | 561977 | 7912294 | N | N |
| MCV-2-3 | MCV-2-3 | Stream | Culvert | Rail | 561865 | 7912353 | N | N |
| MCV-2-4 | MCV-2-4 | Stream | Culvert | Rail | 561798 | 7912464 | N | N |
| MCV-2-5 | MCV-2-5 | Stream | Culvert | Rail | 561724 | 7912483 | N | N |
| MCV-2-6 | MCV-2-6 | Stream | Culvert | Rail | 561636 | 7912823 | N | N |
| MCV-2-7 | MCV-2-7 | Stream | Culvert | Rail | 561375 | 7913010 | N | N |
| MCV-2-8 | MCV-2-8 | Stream | Culvert | Rail | 561079 | 7912945 | N | N |
| MCV-2-10 | MCV-2-10 | Stream | Culvert | Rail | 561567 | 7912403 | N | N |
| BR-000-1 | BR-0-1 | Stream | Bridge | Rail | 562663 | 7911931 | Y | Y |
| CV-000-0a-Y | MCV-0-2 | Stream | Culvert | Rail | 563441 | 7911548 | P | P |
| CV-000-1a-Y | CV-0-1 | Stream | Culvert | Rail | 563724 | 7911305 | Y | Y |
| CV-000-2-Y | CV-0-3 | Stream | Culvert | Rail | 563790 | 7911225 | Y | Y |
| CV-0-6-N | CV-0-6 | Stream | Culvert | Rail | 563811 | 7911201 | P | P |
| CV-000-3a-Y | CV-0-4 | Stream | Culvert | Rail | 563897 | 7911097 | Y | Y |
| CV-000-3b-Y | CV-0-5 | Stream | Culvert | Rail | 563937 | 7911049 | Y | Y |
| CV-001-2-Y | CV-1-1 | Stream | Culvert | Rail | 564724 | 7910401 | Y | P |
| LE-001-2-Y | - | Lake | Pond Encroachment | Rail | 564736 | 7910386 | Y | P |
| CV-002-1 | CV-2-1 | Stream | Culvert | Rail | 565501 | 7910056 | N | N |
| CV-002-2 | CV-2-2 | Stream | Culvert | Rail | 565754 | 7909825 | N | N |
| CV-003-1 | CV-3-1 | Stream | Culvert | Rail | 565969 | 7909656 | Y | P |
| CV-003-2 | BR-3-2 | Stream | Bridge | Rail | 566714 | 7909225 | P | P |
| CV-004-1 | BR-4-1 | Stream | Bridge | Rail | 567003 | 7908968 | Y | P |
| CV-004-2 | CV-4-2 | Stream | Culvert | Rail | 567119 | 7908862 | P | P |
| CV-004-2b | CV-4-4 | Stream | Culvert | Rail | 567155 | 7908830 | N | N |
| CV-004-3 | CV-4-3 | Stream | Culvert | Rail | 567394 | 7908607 | N | N |
| CV-005-1 | CV-5-1 | Stream | Culvert | Rail | 567693 | 7908394 | N | N |
| CV-005-2 | CV-5-2 | Stream | Culvert | Rail | 568005 | 7908253 | N | N |
| CV-005-3 | CV-5-3 | Stream | Culvert | Rail | 568090 | 7908208 | N | N |
| CV-006-1a | CV-6-4 | Stream | Culvert | Rail | 568533 | 7907966 | Y | P |
| CV-006-1 | BR-6-5 | Stream | Bridge | Rail | 568558 | 7907952 | Y | P |
| CV-006-1b | BR-6-1 | Stream | Bridge | Rail | 568608 | 7907925 | Y | P |
| CV-006-2 | CV-6-2 | Stream | Culvert | Rail | 568744 | 7907850 | N | N |
| CV-006-3 | BR-6-3 | Stream | Bridge | Rail | 569021 | 7907669 | Y | P |
| CV-007-1 | CV-7-1 | Stream | Culvert | Rail | 569321 | 7907451 | Y | P |
| CV-007-2 | CV-7-2 | Stream | Culvert | Rail | 569676 | 7907238 | N | N |
| CV-007-3 | BR-7-3 | Stream | Bridge | Rail | 584027 | 7900633 | Y | P |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-008-1 | BR-8-1 | Stream | Bridge | Rail | 570136 | 7906946 | Y | P |
| CV-008-1c | CV-8-3 | Stream | Culvert | Rail | 570399 | 7906778 | N | N |
| CV-008-1b | CV-8-1 | Stream | Culvert | Rail | 570450 | 7906745 | N | N |
| BR-008-1 | BR-8-2 | Stream | Bridge | Rail | 570787 | 7906530 | Y | P |
| CV-008-2 | CV-8-2 | Stream | Culvert | Rail | 570899 | 7906458 | N | N |
| CV-009-0 | CV-9-1 | Stream | Culvert | Rail | 571362 | 7906063 | N | N |
| CV-009-1 | CV-9-2 | Stream | Culvert | Rail | 571541 | 7905888 | P | N |
| CV-009-2-Y | CV-9-3 | Stream | Culvert | Rail | 571681 | 7905756 | N | N |
| CV-009-3-Y | CV-10-1 | Stream | Culvert | Rail | 571905 | 7905606 | N | N |
| CV-010-1-Y | CV-10-2 | Stream | Culvert | Rail | 572333 | 7905371 | N | N |
| CV-011-1 | CV-11-1 | Stream | Culvert | Rail | 572639 | 7905172 | N | N |
| BR-011-1 | BR-11-1 | Stream | Bridge | Rail | 573084 | 7904925 | Y | P |
| CV-011-2 | CV-12-1 | Stream | Culvert | Rail | 573813 | 7904722 | N | N |
| NEWCULV-1 | CV-12-2 | Stream | Culvert | Rail | 573913 | 7904695 | N | N |
| CV-012-1 | CV-12-3 | Stream | Culvert | Rail | 574004 | 7904658 | N | N |
| CV-012-2 | CV-12-4 | Stream | Culvert | Rail | 574242 | 7904527 | P | P |
| CV-013-1 | CV-13-1 | Stream | Culvert | Rail | 574988 | 7904117 | P | P |
| CV-013-2 | CV-13-2 | Stream | Culvert | Rail | 575202 | 7904021 | N | N |
| CV-014-1 | CV-14-1 | Stream | Culvert | Rail | 575522 | 7903864 | N | N |
| CV-014-2 | CV-14-2 | Stream | Culvert | Rail | 575671 | 7903774 | P | P |
| CV-014-3 | CV-14-3 | Stream | Culvert | Rail | 575880 | 7903649 | N | N |
| CV-014-4 | CV-15-1 | Stream | Culvert | Rail | 576276 | 7903497 | N | N |
| CV-015-1-Y | CV-15-2 | Stream | Culvert | Rail | 576871 | 7903191 | N | N |
| CV-016-1-Y | CV-16-1 | Stream | Culvert | Rail | 577085 | 7903097 | Y | P |
| CV-016-2-R | CV-16-2 | Stream | Culvert | Rail | 577419 | 7902952 | N | N |
| CV-016-2a-R | CV-16-3 | Stream | Culvert | Rail | 577685 | 7902836 | P | P |
| CV-016-4-R | CV-16-4 | Stream | Culvert | Rail | 577811 | 7902781 | Y | P |
| NEWCULV-2 | CV-16-7 | Pond | Pond Infill + Culvert | Rail | 577833 | 7902772 | Y | P |
| LE-017-1-R | CV-17-1 | Pond/Stream | Pond Encroachment + Culvert | Rail | 578074 | 7902655 | Y | Y |
| CV-017-1-Y | CV-17-3 | Stream | Culvert | Rail | 578340 | 7902503 | P | P |
| CV-017-2-Y | CV-17-2 | Stream | Culvert | Rail | 578736 | 7902279 | N | N |
| CV-018-1-R | CV-18-1 | Stream | Culvert | Rail | 578854 | 7902211 | Y | P |
| CV-018-2-R | CV-18-2 | Stream | Culvert | Rail | 579066 | 7902110 | N | N |
| CV-019-1 | CV-19-1 | Stream | Culvert | Rail | 579871 | 7901941 | N | N |
| NEWCULV-3 | CV-19-2 | Stream | Culvert | Rail | 580162 | 7901846 | N | N |
| CV-019-2 | CV-19-3 | Stream | Culvert | Rail | 580386 | 7901690 | N | N |
| LE-019-1 | CV-19-4 | Pond | Pond Encroachment + Culvert | Rail | 580638 | 7901631 | N | N |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-019-4 | CV-20-3 | Stream | Culvert | Rail | 580929 | 7901529 | N | N |
| CV-020-1 | CV-20-1 | Stream | Culvert | Rail | 581157 | 7901432 | N | N |
| CV-020-2 | CV-20-2 | Stream | Culvert | Rail | 581345 | 7901380 | N | N |
| CV-021-1a | CV-21-1 | Stream | Culvert | Rail | 581640 | 7901290 | N | N |
| CV-021-1b | CV-21-2 | Stream | Culvert | Rail | 581786 | 7901233 | N | N |
| CV-021-2a | CV-21-3 | Stream | Culvert | Rail | 582564 | 7901017 | N | N |
| CV-022-1 | CV-22-1 | Stream | Culvert | Rail | 582843 | 7900967 | N | N |
| CV-022-2 | CV-22-2 | Stream | Culvert | Rail | 583059 | 7900918 | N | N |
| CV-022-3 | CV-22-3 | Stream | Culvert | Rail | 583227 | 7900891 | N | N |
| CV-022-5 | CV-22-5 | Stream | Culvert | Rail | 583533 | 7900807 | N | N |
| NEWCULV-4 | CV-23-3 | Stream | Culvert | Rail | 583883 | 7900684 | N | N |
| CV-023-1 | BR-23-1 | Stream | Bridge | Rail | 584027 | 7900633 | Y | P |
| CV-024-1-R | CV-24-1 | Stream | Culvert | Rail | 584840 | 7900384 | N | N |
| LE-024-2-R | CV-24-2 | Pond | Pond Encroachment + Culvert | Rail | 585145 | 7900250 | N | N |
| CV-024-1c | - | Stream | Culvert | Rail | 585180 | 7900227 | N | N |
| CV-024-2 | CV-24-3 | Stream | Culvert | Rail | 585256 | 7900158 | N | N |
| BR-025-1 | BR-25-1 | Stream | Bridge | Rail | 585381 | 7900048 | Y | P |
| CV-R01 | CV-25-1 | Stream | Culvert | Rail | 585836 | 7899669 | N | N |
| CV-R02 | CV-26-1 | Stream | Culvert | Rail | 586172 | 7899455 | N | N |
| CV-R02b | CV-26-2 | Stream | Culvert | Rail | 586529 | 7899075 | N | N |
| CV-R03 | CV-26-3 | Stream | Culvert | Rail | 586671 | 7899019 | N | N |
| CV-R03c/R04 | CV-27-1 | Stream | Culvert | Rail | 587200 | 7898807 | N | N |
| CV-027-2 | CV-27-2 | Stream | Culvert | Rail | 587469 | 7898624 | Y | Y |
| CV-R05 | CV-27-3 | Stream | Culvert | Rail | 587558 | 7898563 | N | N |
| CV-R06 | CV-27-4 | Stream | Culvert | Rail | 587681 | 7898478 | P | Y |
| CV-R07 | CV-28-1 | Stream | Culvert | Rail | 588152 | 7898234 | Y | Y |
| CV-R07b2 | CV-28-2 | Stream | Culvert | Rail | 588627 | 7898080 | P | P |
| CV-R07b3 | CV-28-3 | Stream | Culvert | Rail | 588768 | 7897987 | Y | Y |
| CV-R07c2 | CV-29-1 | Stream | Culvert | Rail | 589582 | 7897719 | Y | P |
| CV-R07f | CV-30-1 | Stream | Culvert | Rail | 590302 | 7897484 | N | N |
| CV-R07d | CV-31-1 | Stream/pond | Stream Culvert Crossing + Pond Encroachment | Rail | 590821 | 7897272 | N | N |
| CV-R08 | CV-31-2 | Stream | Culvert | Rail | 591338 | 7897149 | N | N |
| CV-R08b | CV-32-1 | Stream | Culvert | Rail | 591789 | 7897040 | N | N |
| CV-R08c | CV-32-2 | Stream | Culvert | Rail | 592427 | 7896817 | N | N |
| CV-R08d | CV-33-1 | Stream | Culvert | Rail | 592755 | 7896647 | N | N |
| CV-R08e | CV-33-2 | Stream | Culvert | Rail | 593293 | 7896458 | N | N |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-R08f | CV-34-1 | Stream | Culvert | Rail | 593590 | 7896432 | N | N |
| CV-R09-R | CV-34-2 | Stream | Culvert | Rail | 593792 | 7896357 | N | N |
| CV-R10-Y | CV-34-4 | Stream | Culvert | Rail | 594267 | 7896175 | N | N |
| CV-R11-Y | CV-35-6 | Stream | Culvert | Rail | 594558 | 7896151 | N | N |
| CV-R13-Y | BR-35-1 | Stream | Bridge | Rail | 594824 | 7896031 | Y | P |
| CV-R14-Y | CV-35-2 | Stream | Culvert | Rail | 594979 | 7895906 | N | N |
| CV-R15-Y | CV-35-3 | Stream | Culvert | Rail | 595102 | 7895572 | N | N |
| CV-R16-Y | BR-36-1 | Stream | Bridge | Rail | 595092 | 7895426 | Y | Y |
| CV-R17-Y | CV-36-1 | Stream | Culvert | Rail | 595075 | 7895231 | N | N |
| CV-R18-Y | CV-36-2 | Stream | Culvert | Rail | 595102 | 7894910 | N | N |
| CV-R19 | - | Stream | Stream Infill | Rail | 595300 | 7894405 | N | N |
| CV-R20 | - | Stream | Stream Infill | Rail | 595335 | 7894316 | N | N |
| LE-R36 | - | Pond | Pond Infill | Rail | 595377 | 7894215 | N | N |
| CV-R21 | BR-37-1 | Stream | Bridge | Rail | 595451 | 7894042 | Y | Y |
| CV-R23-Y | CV-38-1 | Stream/pond | Stream Culvert Crossing + Pond Encroachment | Rail | 595645 | 7893518 | N | N |
| LE-R36c-Y | CV-38-4 | Ponds | Pond infill + culvert | Rail | 595656 | 7893432 | N | N |
| CV-038-2-Y | CV-38-2 | Stream/pond | Stream Culvert Crossing + Pond Encroachment | Rail | 595694 | 7893118 | N | N |
| LE-38-Y | - | Pond | Pond Encroachment | Rail | 595687 | 7892982 | P | P |
| LE-R38a-Y | CV-38-3 | Pond/Stream | Culvert Stream Crossing + Pond Infill | Rail | 595731 | 7892796 | Y | Y |
| CV-039-2d-Y | CV-38-5 | Stream | Culvert | Rail | 595736 | 7892755 | Y | Y |
| CV-039-2c-Y | CV-39-1 | Stream/Low Point | Culvert | Rail | 595747 | 7892659 | P | P |
| CV-039-2b-Y | CV-39-4 | Stream/Low Point | Culvert | Rail | 595757 | 7892572 | P | P |
| LE-R38d-Y | - | Pond | Pond Encroachment | Rail | 595772 | 7892472 | N | N |
| CV-039-2-Y | CV-39-2 | Pond | Pond Encroachment + Culvert | Rail | 595806 | 7892360 | N | N |
| LE-R38c-Y | CV-39-3 | Pond | Pond Encroachment + Culvert | Rail | 595978 | 7892069 | N | N |
| CV-R24-Y | CV-40-1 | Stream | Culvert | Rail | 596472 | 7891650 | P | P |
| LE-R39c-Y | - | Pond | Pond Encroachment | Rail | 596799 | 7891392 | N | N |
| LE-R39d-Y | CV-40-5 | Pond | Pond Encroachment + Culvert | Rail | 596869 | 7891225 | P | Y |
| CV-R27-Y | CV-40-4 | Stream | Culvert | Rail | 596889 | 7891176 | P | Y |
| CV-R28-Y | CV-41-1 | Stream | Culvert | Rail | 597223 | 7890375 | N | N |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-R29-Y | CV-42-1 | Stream | Culvert | Rail | 597419 | 7889764 | Y | P |
| LE-R40 | - | Pond | Pond Encroachment | Rail | 597330 | 7889378 | N | N |
| CV-R30 | CV-43-1 | Stream | Culvert | Rail | 597271 | 7888579 | N | N |
| CV-R31 | CV-44-1 | Stream | Culvert | Rail | 597363 | 7888228 | N | N |
| CV-R32-Y | CV-44-2 | Stream | Culvert | Rail | 597528 | 7887519 | N | N |
| CV-R33-Y | BR-44-1 | Stream | Bridge | Rail | 597488 | 7887336 | Y | P |
| CV-R33b-Y | CV-45-1 | Stream | Culvert | Rail | 597118 | 7886948 | N | N |
| CV-R34-Y | BR-46-1 | Stream | Bridge | Rail | 596731 | 7886473 | Y | Y |
| CV-044-1-Y | CV-44-4 | Stream | Culvert | Rail | 596549 | 7885801 | Y | Y |
| CV-044-3-Y | CV-44-6 | Stream | Culvert | Rail | 596556 | 7885022 | Y | Y |
| CV-045-1 | CV-45-2 | Stream | Culvert | Rail | 597156 | 7884190 | N | Y |
| LE-047-1 | CV-46-2 | Stream/pond | Culvert Stream Crossing + Pond Encroachment | Rail | 597765 | 7883345 | P | Y |
| CV-047-1 | CV-47-1 | Stream | Culvert | Rail | 598224 | 7882684 | P | Y |
| CV-047-1a | CV-47-2 | Stream | Culvert | Rail | 598259 | 7882557 | N | N |
| LE-048-1 | CV-48-1 | Pond | Pond Encroachment + Culvert | Rail | 598058 | 7881600 | N | N |
| CV-049-1 | CV-49-1 | Stream | Culvert | Rail | 597961 | 7881470 | N | N |
| CV-049-2 | CV-49-2 | Stream | Culvert | Rail | 597789 | 7881236 | P | Y |
| LE-049-3 | - | Pond | Pond Encroachment | Rail | 597493 | 7880832 | P | Y |
| CV-049-3 | CV-49-3 | Stream | Culvert | Rail | 597452 | 7880776 | P | Y |
| CV-050-1 | CV-50-1 | Stream | Culvert | Rail | 597348 | 7880635 | P | Y |
| CV-050-2 | CV-50-2 | Stream | Culvert | Rail | 596938 | 7880077 | P | Y |
| CV-051-1 | CV-51-1 | Stream | Culvert | Rail | 596681 | 7879663 | N | N |
| CV-051-2 | BR-51-1 | Stream | Bridge + Stream Encroachment | Rail | 596662 | 7879362 | P | Y |
| CV-051-3 | CV-51-2 | Stream | Culvert | Rail | 596675 | 7879162 | P | Y |
| CV-052-1 | CV-52-1 | Stream | Culvert | Rail | 596976 | 7878567 | N | N |
| LE-052-2 | - | Pond | Pond Encroachment | Rail | 597248 | 7878366 | N | Y |
| CV-052-2 | CV-52-2 | Stream | Culvert | Rail | 597276 | 7878344 | P | Y |
| CV-053-1 | CV-53-1 | Stream | Culvert | Rail | 597674 | 7878068 | P | Y |
| CV-056-1 | CV-56-1 | Stream | Culvert | Rail | 598812 | 7875712 | P | Y |
| LE-057-1 | CV-57-1 | Pond | Pond Encroachment + Culvert | Rail | 599439 | 7874631 | N | N |
| BR-057-1 | BR-57-1 | Stream | Bridge | Rail | 599446 | 7874415 | P | Y |
| LE-057-2 | CV-57-3 | Pond | Pond Encroachment + Culvert | Rail | 599399 | 7874248 | P | Y |
| BR-059-1 | BR-59-1 | Stream | Bridge | Rail | 598853 | 7872527 | P | Y |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-060-1 | CV-60-1 | Stream | Culvert | Rail | 598645 | 7871711 | N | N |
| NEWCULV-20 | CV-61-1 | Stream | Culvert | Rail | 598360 | 7870973 | N | N |
| CV-062-1 | CV-62-1 | Stream | Culvert | Rail | 598221 | 7869603 | Y | Y |
| CV-063-1 | CV-63-1 | Stream | Culvert | Rail | 598603 | 7868734 | P | P |
| CV-064-1 | CV-64-1 | Stream | Culvert | Rail | 598994 | 7867841 | P | Y |
| CV-065-2 | CV-65-2 | Stream | Culvert | Rail | 599244 | 7867273 | P | Y |
| CV-065-2a | CV-65-3 | Stream | Culvert | Rail | 599296 | 7867152 | P | P |
| CV-067-1 | CV-67-1 | Stream | Culvert | Rail | 600283 | 7866024 | N | N |
| CV-068-1 | CV-68-1 | Stream | Culvert | Rail | 601069 | 7865449 | N | N |
| CV-069-1 | CV-69-1 | Stream | Culvert | Rail | 601905 | 7864754 | N | N |
| CV-069-1b | CV-69-3 | Stream | Culvert | Rail | 601927 | 7864716 | N | N |
| CV-069-2 | CV-69-2 | Stream | Culvert | Rail | 602126 | 7864368 | N | Y |
| CV-071-1 | CV-71-1 | Stream | Culvert | Rail | 602564 | 7862409 | N | Y |
| NEWCULV-23 | CV-72-1 | Stream | Culvert | Rail | 603051 | 7861146 | N | Y |
| CV-073-1 | CV-73-1 | Stream | Culvert | Rail | 603093 | 7861081 | N | Y |
| NEWCULV-24 | CV-73-2 | Stream | Culvert | Rail | 603369 | 7860787 | N | N |
| LE-074-1 | - | Pond | Pond infill | Rail | 603758 | 7860038 | N | N |
| CV-074-1 | CV-74-1 | Stream | Stream Infill + Culvert | Rail | 603759 | 7859894 | N | P |
| CV-075-1-Y | CV-75-1 | Stream | Culvert | Rail | 603759 | 7859338 | N | N |
| CV-075-1b-Y | CV-75-2 | Pond | Pond Encroachment + Culvert | Rail | 603770 | 7859218 | N | N |
| CV-075-2-Y | BR-75-1 | Stream | Bridge | Rail | 603962 | 7858904 | N | P |
| CV-076-1 | BR-76-1 | Stream | Bridge | Rail | 604251 | 7858661 | N | Y |
| CV-076-2 | BR-76-2 | Stream | Bridge | Rail | 604304 | 7858627 | N | Y |
| CV-076-3 | BR-76-3 | Stream | Bridge | Rail | 604396 | 7858569 | N | Y |
| CV-076-4-Y | CV-76-4 | Stream | Culvert | Rail | 604923 | 7858087 | N | N |
| CV-077-1-Y | CV-77-1 | Stream | Culvert | Rail | 605010 | 7857945 | N | N |
| CV-077-2-Y | CV-77-2 | Stream | Culvert | Rail | 605069 | 7857828 | N | N |
| CV-078-1 | BR-78-1 | Stream | Bridge | Rail | 605518 | 7856472 | N | Y |
| CV-078-2 | CV-78-2 | Stream | Culvert | Rail | 605517 | 7856239 | N | P |
| CV-078-3 | CV-78-3 | Stream | Culvert | Rail | 605514 | 7856111 | N | N |
| CV-079-1 | CV-79-1 | Stream | Culvert | Rail | 605510 | 7855881 | N | N |
| CV-079-2 | CV-79-2 | Stream | Culvert | Rail | 605523 | 7855671 | N | N |
| CV-079-3 | CV-79-3 | Stream | Culvert | Rail | 605537 | 7855480 | N | N |
| CV-079-4a | CV-80-1 | Stream | Culvert | Rail | 605545 | 7855100 | N | N |
| CV-080-1c | CV-80-2 | Stream | Culvert | Rail | 605532 | 7854918 | N | P |
| CV-080-2 | CV-80-3 | Stream | Culvert | Rail | 605515 | 7854691 | N | N |
| CV-080-3 | CV-80-4 | Stream | Culvert | Rail | 605509 | 7854495 | N | N |
| CV-080-4 | CV-80-5 | Stream | Culvert | Rail | 605508 | 7854446 | N | N |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-080-5 | CV-80-6 | Stream | Culvert | Rail | 605503 | 7854222 | N | N |
| CV-081-1 | CV-81-1 | Stream | Culvert | Rail | 605499 | 7854094 | N | N |
| NEWCULV-27 | CV-81-2 | Stream | Culvert | Rail | 605499 | 7854055 | N | N |
| CV-081-2 | CV-81-3 | Stream | Culvert | Rail | 605498 | 7854035 | N | N |
| CV-081-3 | CV-81-4 | Stream | Culvert | Rail | 605496 | 7853943 | N | N |
| CV-081-4a | CV-81-5 | Stream | Culvert | Rail | 605490 | 7853694 | N | N |
| CV-081-5b | CV-81-6 | Stream | Culvert | Rail | 605511 | 7853419 | N | P |
| CV-081-5a | CV-81-7 | Stream | Culvert | Rail | 605555 | 7853309 | N | P |
| CV-081-6a | CV-81-8 | Stream | Culvert | Rail | 605624 | 7853205 | N | N |
| CV-081-6b | CV-81-9 | Stream | Culvert | Rail | 605651 | 7853174 | N | N |
| CV-082-1a | CV-82-1 | Stream | Culvert | Rail | 605768 | 7853073 | N | N |
| CV-082-2a | CV-82-2 | Stream | Culvert | Rail | 605905 | 7852966 | N | P |
| CV-082-4a | CV-82-4 | Stream | Culvert | Rail | 606113 | 7852803 | N | N |
| CV-082-4b | CV-82-5 | Stream | Culvert | Rail | 606150 | 7852772 | N | N |
| CV-083-3a | CV-83-2 | Stream | Culvert | Rail | 606430 | 7852073 | N | N |
| CV-084-1 | CV-84-1 | Stream + Low Point | Culvert + Stream Encroachment | Rail | 606387 | 7851178 | N | Y |
| CV-084-2 | CV-84-2 | Stream | Culvert | Rail | 606406 | 7850978 | N | N |
| CV-084-3 | CV-84-3 | Stream | Culvert | Rail | 606398 | 7850783 | N | N |
| CV-084-4 | CV-84-4 | Stream | Culvert | Rail | 606364 | 7850546 | N | N |
| CV-086-1 | BR-86-1 | Stream | Bridge | Rail | 606190 | 7848859 | N | N |
| CV-087-1 | CV-87-1 | Stream | Culvert | Rail | 606285 | 7848016 | N | N |
| CV-089-2 | CV-89-1 | Stream | Culvert | Rail | 606384 | 7846148 | N | N |
| CV-089-1 | CV-89-2 | Stream | Culvert | Rail | 606308 | 7845777 | N | N |
| BR-091-1 | BR-91-1 | Stream | Bridge | Rail | 605958 | 7843777 | N | N |
| BR-092-1 | BR-92-1 | Stream | Bridge | Rail | 606358 | 7842768 | N | N |
| CV-093-1-Y | CV-93-1 | Stream | Culvert | Rail | 606508 | 7842480 | N | N |
| CV-093-2 | CV-93-2 | Stream | Culvert | Rail | 606645 | 7842252 | N | N |
| BR-095-1 | BR-95-1 | Stream/Lake | Bridge | Rail | 607955 | 7840786 | Y | Y |
| AR-050a | - | Pond | Pond Encroachment | Rail | 608042 | 7840734 | Y | Y |
| AR-050b | - | Pond | Pond Encroachment | Rail | 608100 | 7840695 | Y | Y |
| BR-096-1 | BR-96-1 | Stream | Bridge | Rail | 608539 | 7840210 | N | N |
| BR-096-2 | BR-96-2 | Stream | Bridge | Rail | 608671 | 7839714 | Y | P |
| BR-099-1-Y | BR-99-1 | Stream | Bridge | Rail | 608400 | 7837169 | N | N |
| CV-101-1 | CV-101-1 | Stream | Culvert | Rail | 607062 | 7836073 | N | N |
| CV-103-1 | CV-103-1 | Stream | Culvert | Rail | 605056 | 7834683 | N | N |
| BR-105-1 | BR-105-1 | Stream | Bridge | Rail | 604138 | 7833859 | N | N |
| CV-105-1 | CV-105-1 | Stream | Culvert | Rail | 603374 | 7833550 | N | N |
| CV-107-1 | CV-107-1 | Stream | Culvert | Rail | 601556 | 7833054 | N | N |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-109-2-Y | CV-110-1 | Stream | Culvert | Rail | 600338 | 7831480 | N | N |
| CV-110-1-Y | CV-110-3 | Stream | Culvert | Rail | 599901 | 7830940 | N | N |
| LE-111-1-N | - | Lake | Lake Encroachment | Rail | 599371 | 7830561 | Y | Y |
| CV-111-1-Y | BR-111-1 | Stream | Bridge | Rail | 599062 | 7830205 | N | N |
| CV-114-1 | CV-114-1 | Stream | Culvert | Rail | 597593 | 7827853 | N | N |
| CV-115-2 | CV-115-2 | Stream | Culvert | Rail | 597061 | 7826880 | N | N |
| CV-117-1 | CV-117-1 | Stream | Culvert | Rail | 597975 | 7825749 | N | N |
| CV-117-2 | CV-117-2 | Stream | Culvert | Rail | 598195 | 7825569 | Y | P |
| CV-117-3 | CV-117-3 | Stream | Culvert | Rail | 598229 | 7825515 | P | P |
| CV-117-4 | CV-117-4 | Stream | Culvert | Rail | 598236 | 7825502 | P | P |
| CV-118-1 | CV-118-1 | Stream | Culvert | Rail | 598366 | 7825258 | N | N |
| CV-118-1a | CV-118-2 | Stream | Culvert | Rail | 598527 | 7824914 | N | N |
| CV-118-2 | CV-118-3 | Stream | Culvert | Rail | 598594 | 7824544 | Y | P |
| CV-119-1 | CV-119-1 | Stream | Culvert | Rail | 598585 | 7824286 | N | N |
| CV-119-2 | CV-119-2 | Stream | Culvert | Rail | 598530 | 7823963 | N | N |
| CV-119-2a | CV-119-3 | Stream | Culvert | Rail | 598538 | 7823771 | N | N |
| CV-119-2b | CV-119-5 | Stream | Culvert | Rail | 598543 | 7823656 | N | N |
| CV-119-3 | CV-119-4 | Stream | Culvert | Rail | 598604 | 7823370 | N | N |
| CV-120-1 | CV-120-1 | Stream | Culvert | Rail | 598628 | 7822781 | N | N |
| CV-121-1 | CV-121-1 | Stream | Culvert | Rail | 598588 | 7822254 | N | N |
| CV-121-2 | CV-121-2 | Stream | Culvert + Stream Infilling | Rail | 598564 | 7822101 | N | N |
| CV-121-4 | CV-121-4 | Stream | Culvert | Rail | 598521 | 7821860 | N | N |
| CV-121-5 | CV-121-5 | Stream | Culvert | Rail | 598367 | 7821401 | N | N |
| CV-123-1 | CV-123-1 | Stream/Pond | Culvert Stream Crossing + Pond Infill | Rail | 598379 | 7820280 | N | N |
| CV-123-2 | CV-123-2 | Stream | Culvert | Rail | 598448 | 7820129 | N | N |
| CV-123-3 | BR-123-1 | Stream | Bridge | Rail | 598464 | 7819900 | Y | P |
| CV-123-3a | CV-123-5 | Stream | Culvert | Rail | 598462 | 7819849 | N | N |
| CV-123-4a | BR-123-2 | Stream | Bridge | Rail | 598456 | 7819645 | Y | P |
| CV-123-7a | CV-123-4 | Stream | Culvert | Rail | 598454 | 7819563 | Y | P |
| CV-124-1a | CV-124-1 | Stream | Culvert | Rail | 598447 | 7819358 | Y | P |
| CV-124-2a | BR-124-1 | Stream | Bridge | Rail | 598446 | 7819296 | Y | P |
| CV-124-3a | BR-124-2 | Stream | Bridge | Rail | 598443 | 7819201 | Y | P |
| CV-124-4a | CV-124-2 | Stream | Culvert | Rail | 598433 | 7818882 | N | N |
| CV-124-5a | CV-124-3 | Stream | Culvert | Rail | 598419 | 7818734 | N | N |
| CV-125-2-N | CV-125-2 | Stream | Culvert | Rail | 598198 | 7818098 | N | N |
| CV-125-3-N | CV-125-3 | Stream | Culvert | Rail | 598374 | 7817642 | N | N |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-126-1a-N | CV-125-4 | Stream/Pond | Culvert Stream Crossing + Pond Encroachment | Rail | 598464 | 7817535 | N | N |
| CV-126-1-N | CV-126-1 | Stream | Culvert | Rail | 598547 | 7817385 | P | P |
| NEWCULV-29-Y | CV-126-2 | Stream | Culvert | Rail | 598495 | 7816616 | N | N |
| LE-127-1-Y | CV-127-1 | Pond | Culvert + Pond Infill | Rail | 598551 | 7816264 | P | Y |
| LE-127-1a-Y | - | Pond | Pond Encroachment | Rail | 598565 | 7816170 | P | P |
| LE-127-2-Y | CV-127-2 | Pond | Culvert + Pond Infill | Rail | 598583 | 7816058 | P | Y |
| LE-127-2a-Y | - | Pond | Pond Encroachment | Rail | 598591 | 7816008 | P | P |
| LE-127-2c-Y | - | Pond | Pond Encroachment | Rail | 598592 | 7815955 | P | Y |
| LE-127-2d-Y | - | Pond | Pond Encroachment | Rail | 598604 | 7815924 | P | P |
| LE-127-2f-Y | - | Pond | Pond Encroachment | Rail | 598598 | 7815910 | P | Y |
| LE-127-2h-Y | CV-127-3 | Pond | Pond Infill + Culvert | Rail | 598611 | 7815884 | P | P |
| LE-129-0a-Y | - | Pond | Pond Encroachment | Rail | 599031 | 7814814 | P | P |
| LE-129-0b-Y | - | Pond | Pond Encroachment | Rail | 599082 | 7814768 | N | N |
| LE-129-1-Y | CV-129-1 | Stream | Culvert + Stream Encroachment | Rail | 599396 | 7814504 | Y | Y |
| LE-129-2-Y | - | Stream | Stream Encroachment | Rail | 599491 | 7814420 | Y | Y |
| CV-131-1 | CV-131-1 | Stream | Culvert | Rail | 600628 | 7812715 | Y | Y |
| LE-131-1 | CV-131-2 | Pond | Culvert + Pond infill | Rail | 600654 | 7812575 | P | Y |
| LE-132-1 | CV-132-1 | Pond | Culvert + Pond Infill | Rail | 600776 | 7812192 | P | Y |
| CV-133-1 | CV-133-1 | Stream | Culvert | Rail | 601019 | 7811337 | N | N |
| CV-133-2 | CV-133-3 | Stream | Culvert | Rail | 600856 | 7810616 | P | P |
| CV-134-1 | CV-134-1 | Stream | Culvert | Rail | 600613 | 7810410 | N | N |
| CV-134-2 | CV-134-2 | Stream | Culvert + Stream Infilling | Rail | 600454 | 7810352 | N | N |
| LE-134-1 | - | Pond | Pond Encroachment | Rail | 600381 | 7810342 | N | N |
| LE-134-2 | CV-134-4 | Pond | Pond Encroachment + Culvert | Rail | 599854 | 7810263 | N | N |
| CV-136-2-Y | CV-136-2 | Stream | Culvert | Rail | 598557 | 7809065 | N | N |
| BR-137-1 | BR-137-1 | Stream | Bridge | Rail | 598658 | 7807994 | Y | P |
| CV-138-1 | CV-138-1 | Stream | Culvert | Rail | 598854 | 7806967 | N | N |
| CV-140-1 | CV-140-1 | Stream | Culvert | Rail | 598126 | 7805596 | N | N |
| BR-141-1 | BR-141-1 | Stream | Bridge | Rail | 597537 | 7805040 | Y | Y |
| CV-142-1 | CV-142-1 | Stream | Culvert | Rail | 597200 | 7804424 | N | N |
| CV-142-2 | BR-142-2 | Pond/Stream | Bridge + Pond Encroachment | Rail | 596946 | 7803843 | Y | Y |

| NSC Site ID | Systra/ Ausenco Site ID | Waterbody Type | Project Interaction | Area | UTMs | | Fish Habitat (Y/N/P) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Easting | Northing | Arctic Char | Ninespine Stickleback |
| CV-143-1 | CV-144-1 | Stream | Culvert | Rail + Access Road | 595845 | 7803114 | N | N |
| CV-143-2a | CV-144-2 | Stream | Culvert | Rail | 594939 | 7802768 | Y | Y |
| CV-143-2b | CV-144-3 | Stream | Culvert | Rail | 594926 | 7802754 | Y | Y |
| CV-144 | BR-146-1 | Stream | Bridge | Rail | 594414 | 7801226 | Y | Y |
| CV-148-1-N | CV-148-1 | Stream | Culvert | Rail + Access Road | 595645 | 7800368 | P | P |
| SPS-29a | CV-149-1 | Stream | Culvert | Rail + Access Road | 596395 | 7800173 | P | Y |
| CV-145 | CV-150-2 | Stream | Culvert | Rail + Access Road | 595419 | 7800142 | Y | Y |
| AR-CV-144-2 | CV-144-5 | Stream | Culvert | Access Road | 594864 | 7802781 | Y | Y |
| SP-AR-001 | CV-AR-001 | Stream | Culvert | Access Road | 595390 | 7801813 | N | N |
| SP-AR-002 | CV-AR-002 | Stream | Culvert | Access Road | 595616 | 7801473 | Y | P |
| SP-AR-004 | CV-AR-004 | Stream | Culvert | Access Road | 595316 | 7799972 | Y | Y |
| AS-S1 | CV-AS-S1 | Stream | Culvert | Airstrip | 595464 | 7801896 | N | N |
| AS-S2 | CV-AS-S2 | Stream | Culvert | Airstrip | 595739 | 7801551 | P | P |
| LFarm-S1 | - | Stream/ Low point | Infill | Land Farm | 594153 | 7801934 | N | N |
| Steensby Island | - | Pond | Infill | Steensby Island Infrastructure | - | - | N | N |
| 3 Km Lake | 3 Km Lake | Lake | Infill | Water Intake | 596773 | 7800322 | Y | Y |
| 10 Km Lake | 10 Km Lake | Lake | Infill | Water Intake | 596438 | 7804652 | Y | Y |

MINE SITE

MAP 1

MAP 2

MAP 3

MAP 4

MAP 5

MAP 6

MAP 7

MAP 8

MAP 9

MAP 10

MAP 11

MAP 12

MAP 13

MAP 14

MAP 15

MAP 16

MAP 17

MAP 18

MAP 19

MAP 20

MAP 21

MAP 22

Mary Lake

Mary R.

Ravn R.

Angijurjuk Lake

Ravn River

Nina Bang Lake

Cockburn River

Cockburn LK.

Cockburn R.

Steensby Inlet

STEENSBY PORT

N

0 5 10 Kilometres

## FISH BEARING

- Yes/Potential
- No
- Rail (Propsed)

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE- MINE SITE TO STEENSBY PORT MAP EXTENTS INDEX**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 06/14/2021

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\MineToSteensbyPort_SITES_FishHab_MapsExtentIndex_20231215.mxd

Sheardown Lake (Northwest)

Sheardown Lake (Southeast)

Mary River

MCV-2-7
MCV-2-8
MCV-2-6
MCV-2-9
MCV-2-5
MCV-2-4
MCV-2-10
MCV-2-2
MCV-2-3
MCV-2-1
BR-000-1
MCV-1-2-N
CV-000-0c-Y
CV-000-0a-Y
NEW 1
CV-000-1a-Y
CV-0-6-N
CV-000-3a-Y
CV-000-2-Y
CV-000-3b-Y
NEW 2
CV-001-2-Y
CV-1-2-N
NEW 3
LE-001-2-Y
CV-002-1
CV-002-2
CV-003-1
NEW 4
NEW 5

0 0.25 0.5 1 Kilometres

**FISH BEARING**

- Yes/Potential
- No

- Permanent Barrier
- Intermittant Barrier

- Proposed Rail
- Proposed Embankment
- Existing Road/Infrastructure
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 1**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 22-Jan-24

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map1_Lndscpe_cp_20231218.mxd

NEW 5
CV-003-2
CV-004-1
CV-004-2
CV-004-2b
CV-004-3
CV-005-1
CV-005-2
CV-005-3
NEW 6
NEW 7
CV-006-1b
CV-006-1a
CV-006-1
CV-006-2
CV-006-3
NEW 8
CV-007-1
NEW 9
CV-007-2
CV-007-3
NEW 10
CV-008-1
CV-008-1c
CV-008-1b
BR-008-1
CV-008-2
CV-009-0
CV-009-1
CV-009-2-Y
CV-009-3-Y
NEW 11

N

0 0.25 0.5 1 Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 2**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED:
20-Dec-23

Document Path: W:\PROJECTS\BIM_BaffinIland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map2_Lndscpe_cp_20231219.mxd

NEW 11
CV-010-3-Y
NEW 12
CV-010-1-Y
NEW 13
CV-011-1
BR-011-1
CV-011-2
NEWCULV-1
CV-012-1
CV-012-2
NEW 14
NEW 15
CV-013-1
CV-013-2
CV-014-1
CV-014-2
NEW 16
CV-014-3
NEW 17
CV-014-4
CV-015-1-Y
CV-016-1-Y
CV-016-2-R
CV-016-2a-R
NEWCULV-2
CV-016-4-R
LE-017-1-R
CV-017-1-Y
CV-017-2-Y
CV-018-1-R

N

0 0.25 0.5 1 Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

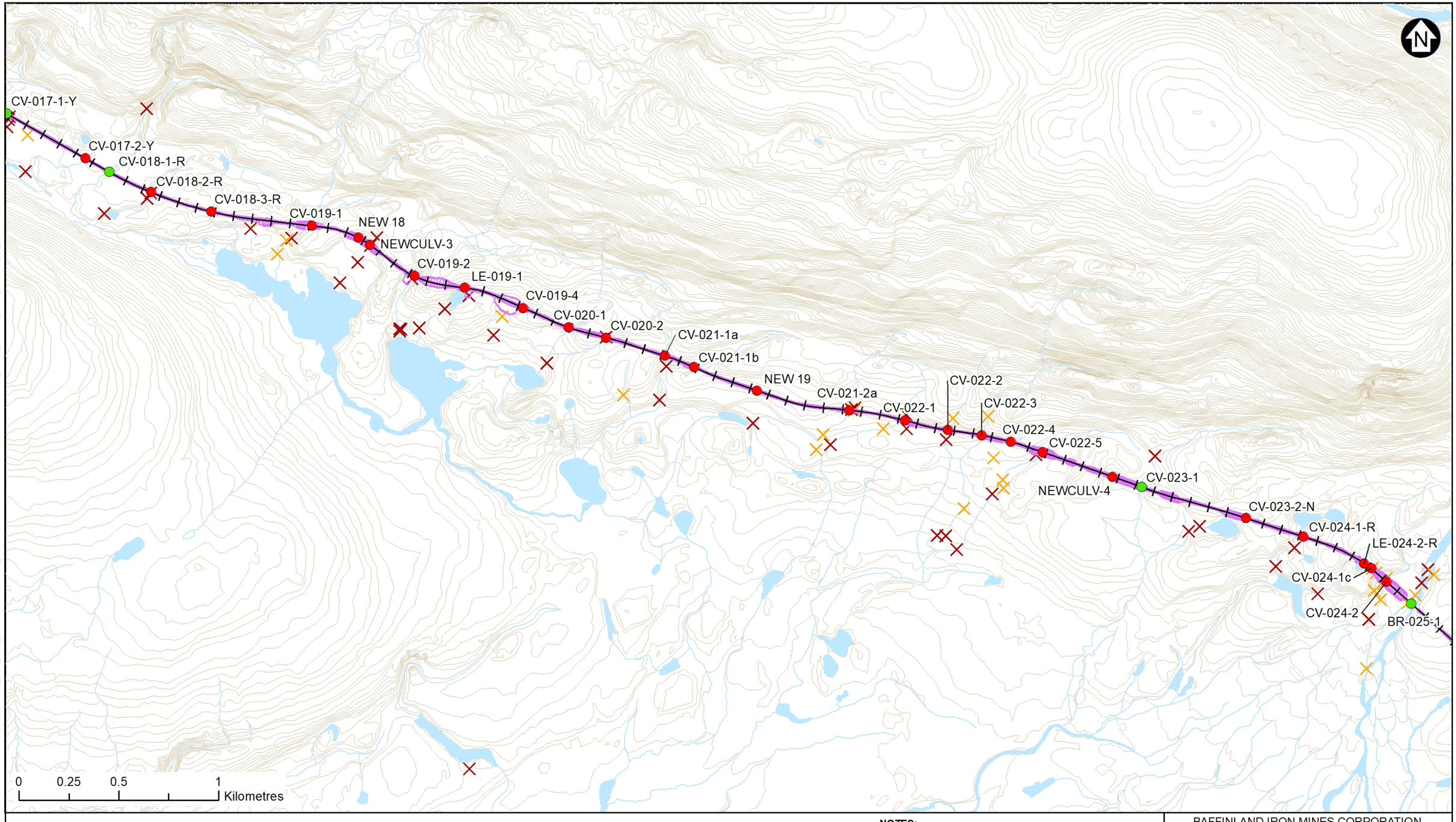
MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 3**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MCI\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map3_Lndscpe_cp_20231219.mxd




**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 4**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED:
20-Dec-23

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map4_Lndscpe_cp_20231219.mxd

LE-024-2-R
CV-024-1c
CV-024-2
BR-025-1
CV-R01
CV-R02
CV-R02b
CV-R03
NEW 20
CV-R03b
CV-R03c/R04
CV-027-2
CV-R05
CV-R06
CV-R07
CV-R07b2
CV-R07b3
CV-R07c2
CV-R07f
CV-R07d
CV-R08
NEW 23
NEW 21
NEW 22
CV-R08b

N

0 0.25 0.5 1 Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 5**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map5_Lndscpe_cp_20231219.mxd

CV-R07f
CV-R07d
NEW 21
NEW 22
CV-R08
NEW 23
CV-R08b
NEW 24
CV-R08c
CV-R08d
CV-R08e
CV-R08f
CV-R09-R
CV-R09b-Y
CV-R10-Y
CV-R11-Y
CV-R12-Y
CV-R13-Y
CV-R14-Y
CV-R15-Y
CV-R16-Y
CV-R17-Y
CV-R18-Y
CV-R19
CV-R20
LE-R36
CV-R21
*Ravn River*

0 0.25 0.5 1 Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 6**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED:
20-Dec-23

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map6_Lndscpe_cp_20231219.mxd

CV-R15-Y
CV-R16-Y
CV-R17-Y
CV-R18-Y
CV-R19
CV-R20
LE-R36
CV-R21
Ravn River
CV-R23-Y
LE-R36c-Y
CV-038-2-Y
LE-38-Y
LE-R38a-Y
CV-039-2d-Y
CV-039-2c-Y
CV-039-2b-Y
LE-R38d-Y
CV-039-2-Y
LE-R38c-Y
NEW 25
CV-R24-Y
CV-R39-Y
CV-040-3-Y
LE-R39c-Y
LE-R39d-Y
CV-R27-Y
NEW 26
CV-R28-Y
CV-R29-Y
LE-R40

0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 7**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 19-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map7_Portrait_cp_20231219.mxd

CV-R29-Y
LE-R40
CV-R30
CV-R31
CV-R32-Y
CV-R33-Y
CV-R33b-Y
CV-R34-Y
CV-R35
CV-044-1-Y
CV-044-2-Y
CV-044-3-Y
CV-045-1
NEWCULV-8
LE-047-1

0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 8**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED:
19-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map8_Portrait_cp_20231219.mxd

LE-047-1
CV-047-1
CV-047-1a
LE-048-1
CV-049-1
CV-049-2
LE-049-3
CV-049-3
CV-050-1
CV-050-2
CV-051-1
CV-051-2
CV-051-3
CV-052-1
LE-052-2
CV-052-2
CV-053-1
NEWCULV-16
NEWCULV-17

0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 9**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 19-Dec-23

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map9_Portrait_cp_20231219.mxd

NEWCULV-16

NEWCULV-17

CV-056-1

LE-057-1

BR-057-1

LE-057-2

NEWCULV-19

BR-059-1

CV-060-1

N

0 0.5 1

Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier

- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 10**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 19-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map10_Portrait_cp_20231219.mxd

CV-060-1

NEWCULV-20

CV-062-1

CV-063-1

CV-064-1

CV-065-1

CV-065-2

CV-065-2a

CV-067-1

NEWCULV-21

CV-068-1

NEWCULV-22

0 0.5 1

Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 11**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 19-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHab\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map11_Portrait_cp_20231219.mxd

NEWCULV-21
CV-068-1
NEWCULV-22
CV-069-1
CV-069-1b
CV-069-2
CV-071-1
NEWCULV-23
CV-073-1
NEWCULV-24
LE-074-1
CV-074-1
CV-075-1-Y
CV-075-1b-Y

N

0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 12**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 19-Dec-23

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\STBYRoute_SITES_FishHab_Map12_Portrait_cp_20231219.mxd

CV-075-1-Y
CV-075-1b-Y
CV-075-2-Y
CV-076-1
CV-076-2
CV-076-3
CV-076-4-Y
CV-077-1-Y
CV-077-2-Y
CV-078-1
CV-078-2
CV-078-3
CV-079-1
CV-079-2
CV-079-3
CV-079-4a
CV-080-1c
CV-080-2
CV-080-3
CV-080-4
CV-080-5
CV-081-1
NEWCULV-27
CV-081-2
CV-081-3
CV-081-4a
CV-081-5b
CV-081-5a
CV-081-6a
CV-081-6b
CV-082-1a
CV-082-2a
CV-082-3a
CV-082-4a
CV-082-4b
*KM 81 Lake*

N

0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 13**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map13_Portrait_cp_20231219.mxd

CV-082-4a
CV-082-4b
CV-083-1a
CV-083-2a
CV-083-3a
CV-083-4a
CV-084-1
CV-084-2
CV-084-3
CV-084-4
CV-085-1
CV-085-2
CV-85-3-N
CV-85-4-N
CV-86-1-N
CV-086-1
CV-87-2-N
CV-087-1
CV-87-3-N
CV-88-2-N
CV-088-1
CV-88-3-N
CV-88-4-N
CV-89-3-N
CV-89-4-N
CV-089-2

N

0 0.5 1
Kilometres

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map14_Portrait_cp_20231220.mxd

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 14**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED:
20-Dec-23

CV-089-2
CV-089-1
CV-90-2-N
CV-90-3-N
CV-090-1
CV-90-1-N
BR-091-1
Cockburn Lake
BR-092-1
CV-093-1-Y
CV-093-2
CV-094-1
BR-095-1
AR-050a
AR-050b
BR-096-1
BR-096-2
N
0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

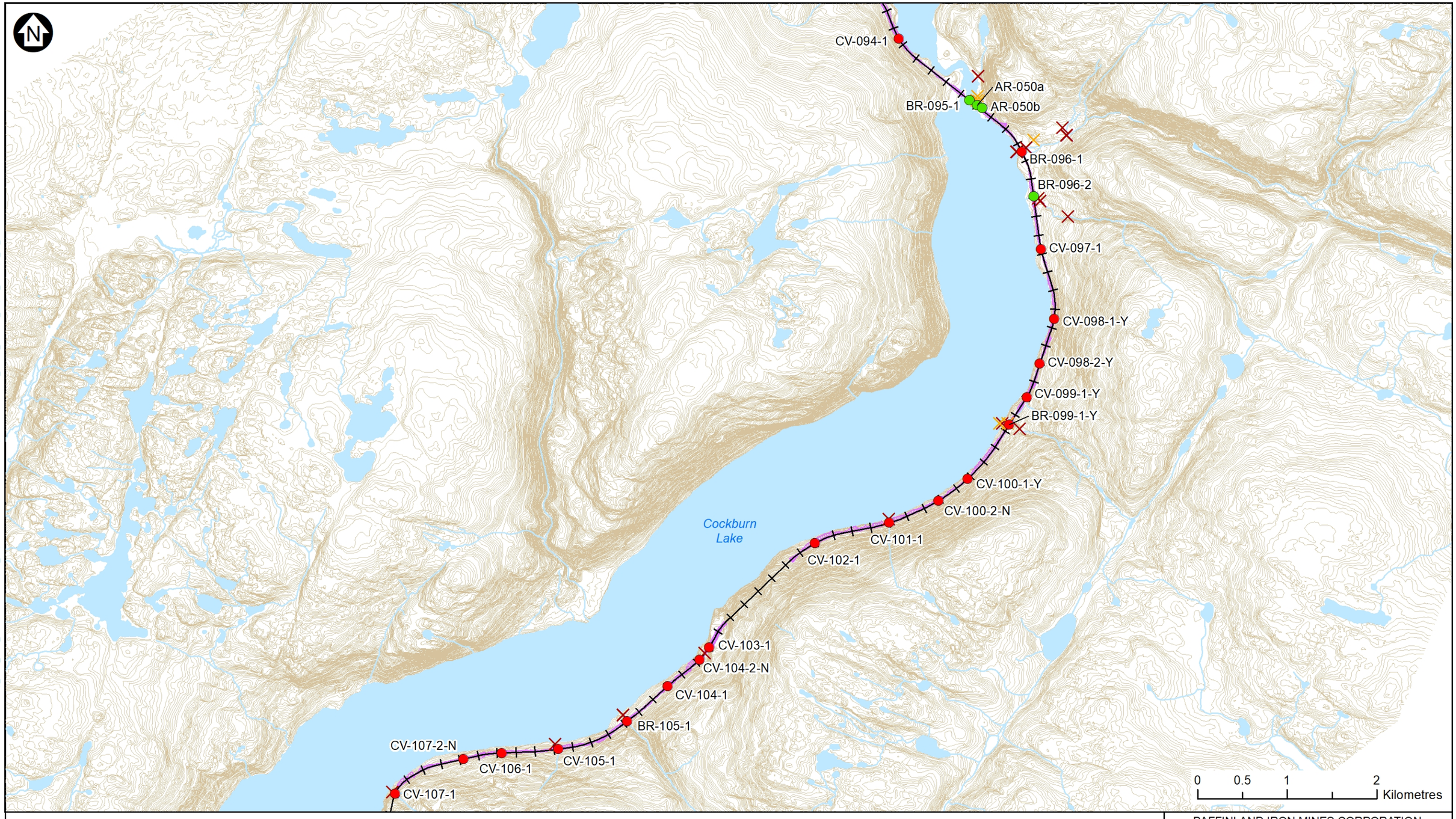
MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 15**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map15_Portrait_cp_20231220.mxd




**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

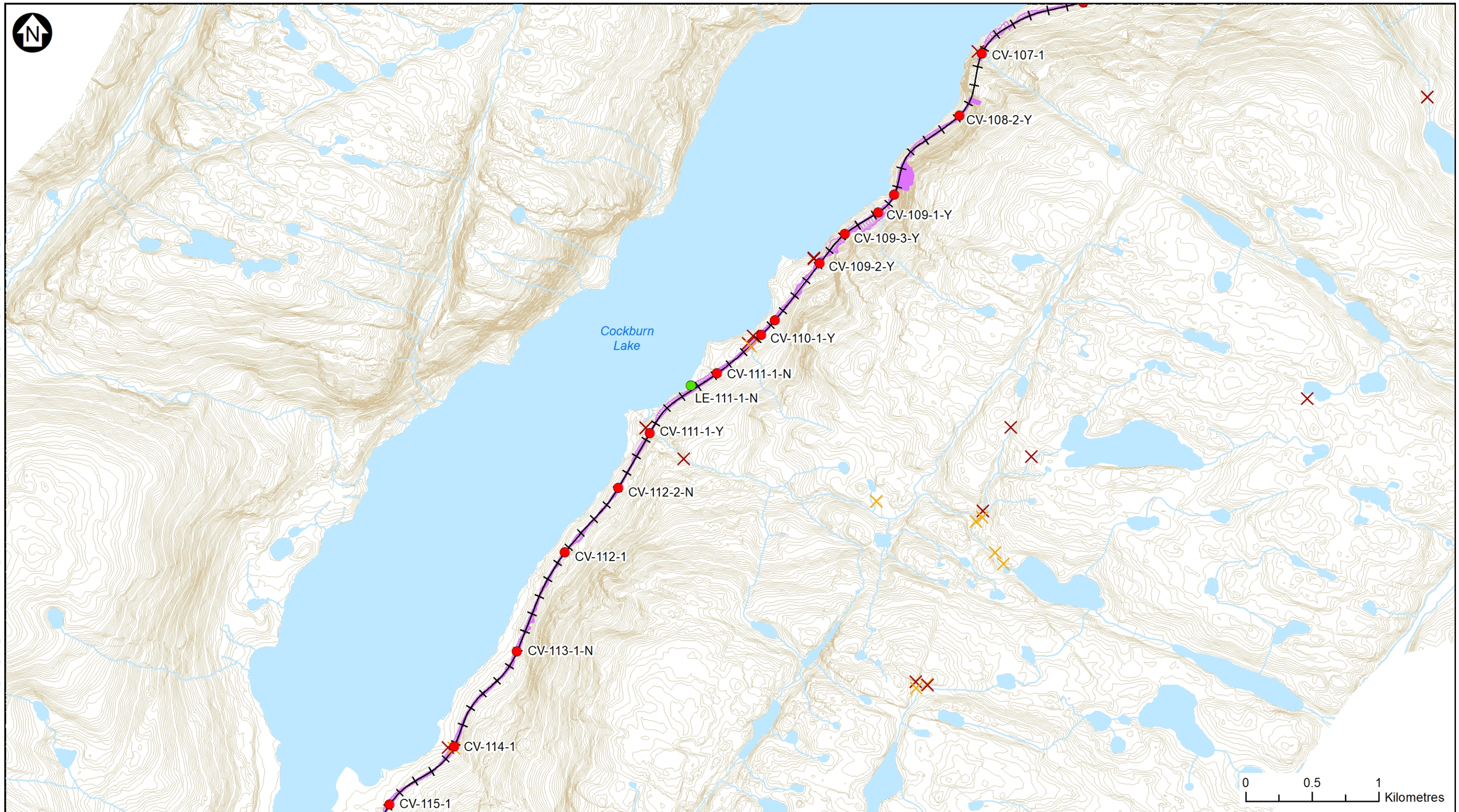
MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 16**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map16_Lndscpe_cp_20231220.mxd




**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

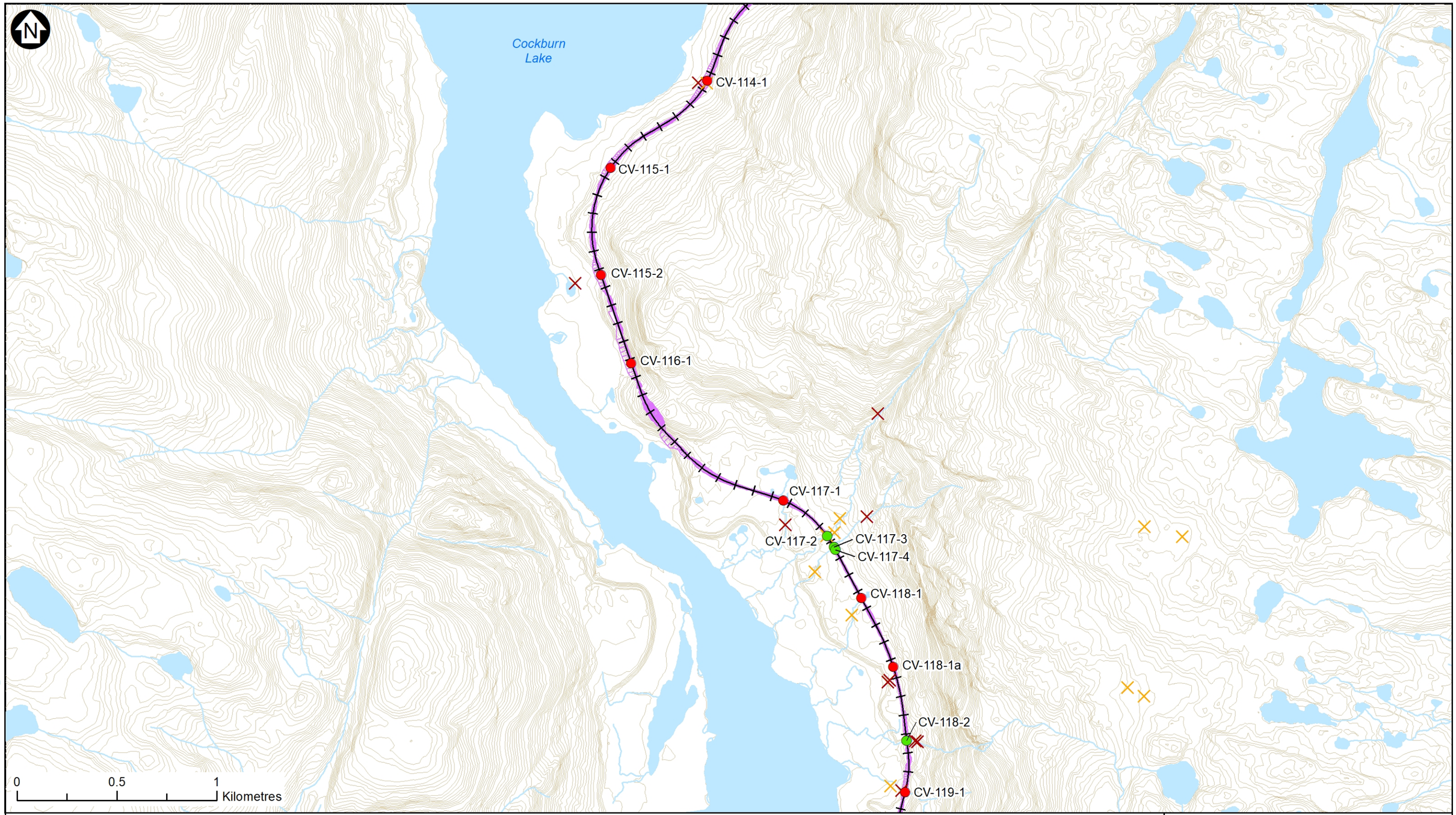
MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 17**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM_Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map17_Lndscpe_cp_20231220.mxd




**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 18**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Path: \\terastation\GIS\Projects\OtherMary River Freshwater\2010\Genrtd_DataReport_Maps\ToteRD

CV-118-2
CV-119-1
CV-119-2
CV-119-2a
CV-119-2b
CV-119-3
CV-119-6
CV-120-1
CV-121-1
CV-121-2
CV-121-3
CV-121-4
CV-121-5
CV-122-1
CV-123-1
CV-123-2
CV-123-3
CV-123-3a
CV-123-4a
CV-123-7a
CV-124-1a
CV-124-2a
CV-124-3a
CV-124-4a
CV-124-5a
CV-125-1
CV-125-2-N

*Cockburn Lake*

0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 19**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED:
20-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map19_Portrait_cp_20231220.mxd

CV-125-2-N
CV-125-3-N
CV-126-1a-N
CV-126-1-N
NEWCULV-29-Y
LE-127-1-Y
LE-127-1a-Y
LE-127-2-Y
LE-127-2a-Y
LE-127-2c-Y
LE-127-2d-Y
LE-127-2f-Y
LE-127-2h-Y
CV-128-1-N
CV-128-1-Y
CV-128-3-Y
LE-129-0a-Y
LE-129-0b-Y
LE-129-1-Y
LE-129-2-Y
CV-130-1-Y
CV-130-2-Y
CV-131-1
LE-131-1
LE-132-1
NEWCULV-30

0 0.5 1
Kilometres

## FISH BEARING

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier
- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 20**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map20_Portrait_cp_20231223.mxd

LE-131-1
LE-132-1
NEWCULV-30
CV-133-1
CV-133-1a
CV-133-2
CV-134-1
CV-134-2
LE-134-1
CV-134-3
LE-134-2
CV-134-5
CV-136-1-Y
CV-136-2-Y
BR-137-1
CV-138-1
CV-139-1-N
CV-139-2

0 0.5 1
Kilometres

**FISH BEARING**

- Yes/Potential
- No
- Permanent Barrier
- Intermittant Barrier

- Proposed Rail
- Proposed Embankment
- Contour

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 21**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED:
20-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyRoute\STBYRoute_SITES_FishHab_Map21_Portrait_cp_20231220.mxd

**NOTES:**

1. Base Data Source: Eagle Mapping (2005)
2. Co-ordinate System: UTM Zone 17N NAD 1983
3. Contour Interval is in metres
4. Railway Alignment Provided by Systra (Nov 13, 2023)
5. Steensby Infrastructure Provided by Ausenco (Dec 6, 2023)

N

CV-139-2
CV-140-1
10 KM Lake
BR-141-1
10 KM Lake (Water Intake)
CV-142-1
CV-142-2
CV-144-4-N
CV-143-1
AR-CV-144-2
CV-143-2a
CV-143-2b
CV-145-1-N
LFarm-S1
AS-S1
SP-AR-001
AS-S2
LE-143-1
SP-AR-002
Airstrip
Permanent Camp
CV-144
CV-147-1-N
Fuel Storage
CV-147-2-N
CV-147-3-N
CV-147-4-N
CV-148-2-N
CV-150-3-N
CV-148-1-N
3 KM Lake (Water Intake)
3 KM Lake
CV-145
SPS-29a
SP-AR-004
CV-150-1-N
Steensby Inlet

0 0.5 1
Kilometres

**FISH BEARING**
- Yes/Potential
- No

**PROPOSED INFRASTRUCTURE**
- Rail
- Embankment
- Access Road
- Other
- Laydown
- Permanent Barrier
- Intermittant Barrier
- Contour

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**STEENSBY ROUTE SITES - MAP 22**

North/South Consultants Inc.
Aquatic Environment Specialists

DATE CREATED: 20-Dec-23

Document Path: W:\PROJECTS\BIM Baffinland Iron Mine\BIM- Steensby_short_2021_MC\GIS\MXDs\Report_Maps\Sites\FishHabClass\SteensbyR

**Attachment 2. Aquatic habitat assessment sheets for fish-bearing sites surveyed along the Steensby Railway alignment and in the Steensby Port area: 2021-2023.**