# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** CV-110-1 **Dates Surveyed:** 4 July & 30 August, 2018 **UTM Coordinates:** 17 W 561084 7912910

## General Physical Characteristics

**Channel Confinement:** C **Channel Gradient (range):** > 10° **Flow Regime:** Intermittent

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

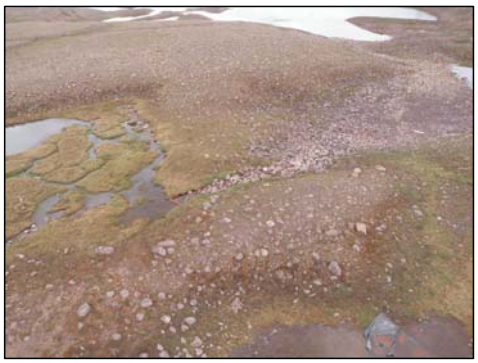
## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This crossing was nearly dry in 2018. In addition, it is upstream of a known permanent barrier to fish movement. There is no fish use of habitat at this crossing.

## Photographs



**A**

**B**

**Figure 1.** Views of CV-110-1 at the crossing during summer (A) and during fall (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** CV-110-2 **Dates Surveyed:** 4 July & 30 August, 2018 **UTM Coordinates:** 17 W 561266 7912241

## General Physical Characteristics

**Channel Confinement:** C **Channel Gradient (range):** N/A **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This crossing was a small, shallow (max depth of 2.0 m) fishless pond that was unconnected to any fish-bearing waterbodies in the area. It was also examined during baseline studies more than a decade ago with the same results. There is no fish use of habitat at this crossing.

## Photographs

**A**

**B**

**Figure 1.** Views of CV-110-2 at the crossing during summer (A) and during fall (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** CV-110-3 **Dates Surveyed:** 4 July & 30 August, 2018 **UTM Coordinates:** 17 W 561445 7912240

## General Physical Characteristics

**Channel Confinement:** C **Channel Gradient (range):** N/A **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This crossing was a small, shallow (max depth of 0.8 m) fishless pond that was unconnected to any fish-bearing waterbodies in the area. It was also examined during baseline studies more than a decade ago with the same results. There is no fish use of habitat at this crossing.

## Photographs

A

B

**Figure 1.** Views of CV-110-3 at the crossing during summer (A) and during fall (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** CV-110-4 **Dates Surveyed:** 4 July & 30 August, 2018 **UTM Coordinates:** 17 W 561546 7912425

## General Physical Characteristics

**Channel Confinement:** C **Channel Gradient (range):** N/A **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This crossing was a small, shallow (max depth of 0.5 m) fishless pond that was unconnected to any fish-bearing waterbodies in the area. It was also examined during baseline studies more than a decade ago with the same results. There is no fish use of habitat at this crossing.

## Photographs

**A**

**B**

**Figure 1.** Views of CV-110-4 at the crossing during summer (A) and during fall (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Access Road Crossing CV-169-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 505149 7972688

## General Physical Characteristics

**Channel Confinement:** PC **Channel Gradient (range):** 2 to 8° **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | M | N |
| **NNST** | N | N | N | N |

## Comments & Summary

Although not captured in 2018, juvenile char have been occasionally observed in this stream during annual Tote Road surveys. It is thought that these char are from an anadromous population that uses Milne Inlet as the stream is not connected to any other overwintering habitat.

## Photographs

**A**

**B**

**Figure 1.** Views of CV-169-1 downstream from the laydown access road crossing; (A) and (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – MARGINAL**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversions CV-146-1, CV-146-2 &CV-146-3

**Dates Surveyed:** 28 June & 23 August, 2018

**UTM Coordinates:** 17 W 508928 7968816, 17 W 508726 7968858 & 17 W 508721 7968887

## General Physical Characteristics

**Channel Confinement:** UC

**Channel Gradient (range):** > 10°

**Flow Regime:** Intermittent

## Fisheries Data

**Gear Used:** Not Fished

**Effort (min):** N/A

**Transect Length (m):** N/A

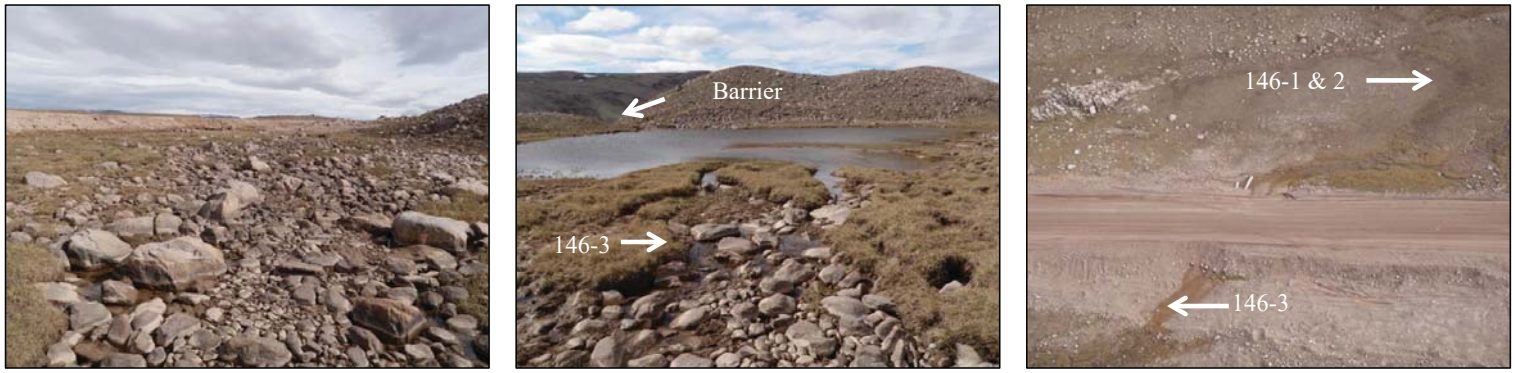
## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This stream had low flows during both surveys. Downstream of the Tote Road it is connected to a fishless pond that flows into Phillips Creek. In addition to several soft barriers (subsurface flow), a permanent vertical barrier between the downstream pond and Phillips Creek prevents fish access to the rail site. There is never aquatic habitat at this crossing.

## Photographs




**A** **B** **C**

**Figure 1.** Views of CV-146-1 & CV-146-2 upstream of the rail crossing during summer (A), CV-146-3 during summer (B), and all three aerially during fall (C).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-131-1 **Dates Surveyed:** 28 June & 23 August, 2018 **UTM Coordinates:** 17 W 511333 7967096

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** 5 to > 15° **Flow Regime:** None

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

Same location as rail crossing CV-12-4. This entire area is a dry, low point on both sides of the existing Tote Road. There is never aquatic habitat at this crossing.

## Photographs

**A**

**B**

**Figure 1.** Views of CV-131-1 at the road diversion crossing during summer (A) and fall (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Temp Haul Road CV-060-1 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527517 7930366

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** 1° **Flow Regime:** Open Water

## Hydrology & Habitat Characteristics

| Site | Channel Width (m) | | Water Depth (m) (Summer/Fall) | | | | Water Velocity (m/s) (Summer/Fall) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bankfull | Wetted | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| **100D** | 16.9 | 13.5 | - | 0.10 | - | 0.10 | - | 0.02 | - | 0.05 |
| **50D** | 2.7 | 2.4 | - | 0.75 | - | 0.75 | - | 0.02 | - | 0.02 |
| **0** | 12.7 | 5.4 / 8.8 | 0.11 / 0.06 | 0.26 / 0.12 | 0.06 / 0.44 | 0.30 / 0.44 | 0.60 / 0.43 | 0.57 / 0.58 | 0.77 / 0.78 | 0.77 / 0.78 |
| **50U** | 17.5 | 8.7 / 6.9 | 0.04 / 0.18 | 0.14 / 0.12 | 0.10 / 0.04 | 0.15 / 0.20 | 0.12 / 0.75 | 0.59 / 0.58 | 0.53 / 0.13 | 0.59 / 0.75 |
| **100U** = CV-60 on road | 11.5 | 7.6 / 7.8 | 0.08 / 0.22 | 0.12 / 0.08 | 0.12 / 0.10 | 0.15 / 0.25 | 0.01 / 0.61 | 0.41 / 0.22 | 0.95 / 0.31 | 0.95 / 0.70 |

| Site | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Other | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| **100D** | 65 | 35 | - | - | - | - | - | 5 | 75 | 20 | - |
| **50D** | 65 | 35 | - | - | - | - | - | 5 | 75 | 20 | - |
| **0** | 80 | 20 | - | - | - | - | - | 10 | 70 | 20 | - |
| **50U** | 70 | 30 | - | - | - | - | - | 10 | 70 | 20 | - |
| **100U**= CV-60 on road | 80 | 20 | - | - | - | - | - | 10 | 70 | 20 | - |

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines**<br>**Mary River Project** | North/South Consultants Inc.<br>Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char - IMPORTANT**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Temp Haul Road CV-060-1 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527517 7930366

## Fisheries Data

**Gear Used:** Backpack Electrofisher **Transect Length (m):** 100

| Species | Season | Effort (min) | Total Caught/Observed | CPUE | Length Range (mm) |
|---|---|---|---|---|---|
| **ARCH** | Summer | 4.50 | 19 | 4.27 | 55 - 113 |
| | Fall | - | N/A | N/A | N/A |
| **NNST** | Summer | 4.50 | 0 | - | - |
| | Fall | - | N/A | N/A | N/A |

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | H | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This temporary haul road crossing is downstream of Tote Road crossing CV-060 and proposed rail crossing CV-55-3. The 100 m upstream transect for CV-060-1 is the equivalent of the existing Tote Road crossing. This stream is important rearing habitat for juvenile char throughout the open-water season, but particularly during summer.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char - IMPORTANT**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Temp Haul Road CV-060-1 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527517 7930366

## Photographs

**A** **B** **C**

**Figure 1.** 100 m (top) and 50 m (bottom) downstream cross-section views of temp haul road crossing CV-060-1; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Temp Haul Road CV-060-1 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527517 7930366

## Photographs

**A** **B** **C**

**Figure 2.** Crossing (top) and 50 m upstream (bottom) cross-section views of temp haul road crossing CV-060-1; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-060-2 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527756 7930278

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** 1° **Flow Regime:** Open Water

## Hydrology & Habitat Characteristics

| Site | Channel Width (m) | | Water Depth (m) (Summer/Fall) | | | | Water Velocity (m/s) (Summer/Fall) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bankfull | Wetted | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| **20D** = CV-55-3 100U | 3.8 | 2.9 | - | 0.58 | - | 0.60 | - | 0.05 | - | 0.05 |
| **0** | 4.2 | 1.5 | - | 0.20 | - | 0.30 | - | 0.22 | - | 0.25 |
| **50U** | 5.1 | 4.1 | - | 0.14 | - | 0.25 | - | 0.21 | - | 0.25 |
| **100U** | 4.7 | 2.2 | - | 0.14 | - | 0.25 | - | 0.24 | - | 0.25 |

| Site | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Other | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| **20D** = CV-55-3 100U | - | 40 | 60 | - | - | - | 100 | - | - | - | - |
| **0** | 5 | 50 | 45 | - | - | - | 100 | - | - | - | - |
| **50U** | 5 | 65 | 30 | - | - | - | 100 | - | - | - | - |
| **100U** | 10 | 65 | 35 | | | | 95 | 5 | - | - | - |

**Baffinland Iron Mines**
**Mary River Project**

North/South Consultants Inc.
Aquatic Environment Specialists

**Fish Habitat Quality**

**Arctic Char - IMPORTANT**

**Ninespine Stickleback – NOT FISH-BEARING**

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-060-2 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527756 7930278

## Fisheries Data

**Gear Used:** Backpack Electrofisher **Transect Length (m):** 100

| Species | Season | Effort (min) | Total Caught/Observed | CPUE | Length Range (mm) |
|---|---|---|---|---|---|
| **ARCH** | Summer | 4.50 | 19 | 4.27 | 55 - 113 |
| | Fall | - | N/A | N/A | N/A |
| **NNST** | Summer | 4.50 | 0 | - | - |
| | Fall | - | N/A | N/A | N/A |

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | H | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This diversion of the Tote Road is upstream of the existing CV-060 crossing and proposed rail CV-55-3 crossing. The 20 m downstream transect of CV-060-2 is approximately 100 m upstream of the rail crossing CV-55-3. This stream is important rearing habitat for juvenile char throughout the open water season, but particularly during summer.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char - IMPORTANT**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-060-2 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527756 7930278

## Photographs

**A** **B** **C**

**Figure 1.** Road crossing (top) and 50 m (bottom) upstream cross-section views of road diversion CV-060-2; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-060-2 **Date Surveyed:** 8 July 2018 **UTM Coordinates:** 17 W 527756 7930278

## Photographs

**A** **B** **C**

**Figure 2.** 100 m upstream cross-section views of road diversion CV-060-2; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Temp Haul Road CV-059-1 **Dates Surveyed:** 8 July & 27 August, 2018 **UTM Coordinates:** 17 W 528010 7929251

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** 1° **Flow Regime:** Open Water

## Hydrology & Habitat Characteristics

| Site | Channel Width (m) | | Water Depth (m) (Summer/Fall) | | | | Water Velocity (m/s) (Summer/Fall) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bankfull | Wetted | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| **0** | 11.9 | 2.0 / 2.7 | - / - | 0.10 / 0.09 | - / 0.06 | 0.10 / 0.10 | - / - | 0.26 / 0.26 | - / 0.17 | 0.30 / 0.30 |

| Site | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Other | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| **0** | 45 | 35 | - | - | - | 20 | 70 | 30 | - | - | - |

**Baffinland Iron Mines**
**Mary River Project**

North/South Consultants Inc.
Aquatic Environment Specialists

**Fish Habitat Quality**

**Arctic Char - MARGINAL**

**Ninespine Stickleback – NOT FISH-BEARING**

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Temp Haul Road CV-059-1 **Dates Surveyed:** 8 July & 27 August, 2018 **UTM Coordinates:** 17 W 528010 7929251

## Fisheries Data

**Gear Used:** Backpack Electrofisher **Transect Length (m):** 100

| Species | Season | Effort (min) | Total Caught/Observed | CPUE | Length Range (mm) |
|---|---|---|---|---|---|
| **ARCH** | Summer | 4.52 | 5 | 1.11 | 99 |
| | Fall | N/A | - | - | - |
| **NNST** | Summer | 4.52 | 0 | - | N/A |
| | Fall | N/A | - | - | - |

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | H | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This temporary haul road crossing is approximately 120 m downstream of the rail crossing at CV-56-1. Additional habitat information for this area can be obtained from the CV-56-1 assessment sheet. The site provides marginal rearing habitat for smaller juvenile char throughout the open-water season, but particularly during summer. Stickleback have never been captured in this watershed in any sampling year.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char - MARGINAL**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Temp Haul Road CV-059-1 **Dates Surveyed:** 8 July & 27 August, 2018 **UTM Coordinates:** 17 W 528010 7929251

## Photographs

A B C

**Figure 1.** Summer (top) and fall (bottom) views at temporary haul road crossing CV-059-1; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-214-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541273 7921956

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** 1° **Flow Regime:** Open

## Hydrology & Habitat Characteristics

| Site | Channel Width (m) | | Water Depth (m) (Summer/Fall) | | | | Water Velocity (m/s) (Summer/Fall) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bankfull | Wetted | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| **50D** | 11.2 | 6.5 / 1.7 | 0.04 / - | 0.03 / 0.05 | 0.15 / - | 0.15 / 0.10 | 0.23 / - | 0.20 / 0.14 | 0.36 / - | 0.40 / 0.20 |
| **0** | 4.1 | 2.5 / 1.2 | 0.08 / - | -/ 0.05 | 0.09 / - | 0.10 / 0.10 | 0.13 / - | - / 0.13 | 0.25 / - | 0.30 / 0.20 |

| Site | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Other | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| **50D** | 50 | 5 | - | - | - | 45 | 100 | - | - | - | - |
| **0** | 40 | 20 | - | - | - | 40 | 100 | - | - | - | - |

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char - NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-214-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541273 7921956

## Fisheries Data

**Gear Used:** Not fished **Transect Length (m):** N/A

| Species | Season | Effort (min) | Total Caught/Observed | CPUE | Length Range (mm) |
|---|---|---|---|---|---|
| **ARCH** | Summer | - | N/A | N/A | N/A |
| | Fall | - | N/A | N/A | N/A |
| **NNST** | Summer | - | N/A | N/A | N/A |
| | Fall | - | N/A | N/A | N/A |

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

The same stream as rail crossing CV-84-3. There was no evidence of fish use of stream habitat in 2018. This broad, flat, very shallow stream does not provide ideal habitat for either species and access from the large downstream river is intermittent with water level fluctuations.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char - NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-214-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541273 7921956

## Photographs

A B C

**Figure 1.** Summer (top) and fall (bottom) views of CV-214-1 at the 50 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-214-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541273 7921956

## Photographs

A B C

**Figure 2.** Summer (top) and fall (bottom) views of CV-214-1 at the road diversion crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-214-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541507 7922071

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** 1-3 **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This stream is known to be not fish-bearing from Tote Road surveys. Despite the fact that it is a tributary to a major river, the culvert at Tote Road crossing CV-85-1 was installed at a natural drop, so it is elevated above the water's surface on the downstream side. As a result, there is no fish use of habitat upstream of CV-85-1, which is where the road diversion is located.

## Photographs

**A** **B** **C**

**Figure 1.** Views of CV-214-2 at the road diversion crossing during summer, looking upstream (A) downstream (B) and across (C). Fall photos were not taken.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-215-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541909 7922250

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** 1° **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This stream is the same as rail crossing CV-85-2. See that assessment for general habitat information, as the road diversion is adjacent to the rail. There was no evidence of fish use of crossing habitat in 2018. Access to the crossing area is likely intermittent and habitat is very shallow with fine substrates. Fish have not previously been noted in this stream, but it is very close to a large, overwintering lake (Muriel Lake) and high water may allow access.

## Photographs

**A** **B** **C**

**Figure 1.** Views of CV-215-1 at the road diversion crossing during summer, looking upstream (A) downstream (B) and across (C). Fall photos were not taken, see rail sheet.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-216-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543381 7921181

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** N/A **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

The crossing is a very shallow (< 5 cm), fishless puddle with no connections to overwintering habitat. There is no fish use of habitat at this crossing.

## Photographs

**A**

**Figure 1.** View of CV-216-1 at the road diversion crossing during summer.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-216-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543524 7921151

## General Physical Characteristics

**Channel Confinement:** UC **Channel Gradient (range):** N/A **Flow Regime:** Open Water

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

The crossing is an isolated, shallow, fishless puddle with no connection to overwintering waterbodies. There is no fish use of habitat at this crossing.

## Photographs

**A**

**Figure 1.** Views of CV-216-2 at the road diversion crossing during summer.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** CV-020-1 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 547094 7919813

## General Physical Characteristics

**Channel Confinement:** PC **Channel Gradient (range):** 2 to > 10 **Flow Regime:** Intermittent

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

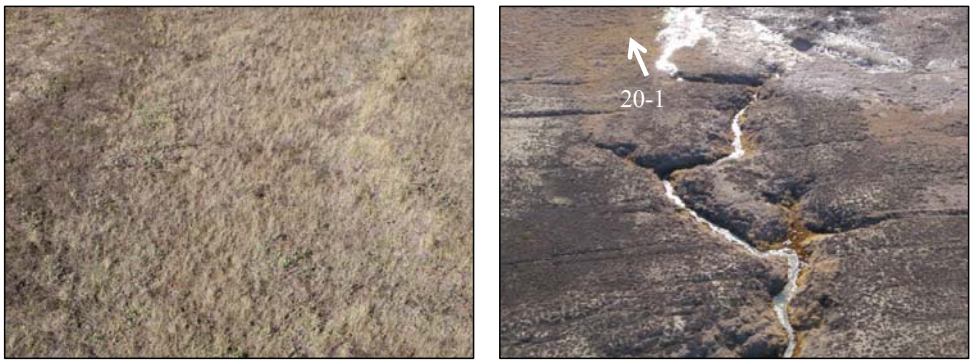
## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This crossing was moist land (terrestrial habitat) in 2018. This road diversion is in the same area as rail crossing CV-91-2 and shares the same downstream barriers and lack of connection to overwintering habitat. There is no fish use of habitat at this crossing.

## Photographs




**A** **B**

**Figure 1.** Views of CV-020-1 at the road diversion crossing during summer (A) and fall (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversion CV-20-2 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 546893 7919846

## General Physical Characteristics

**Channel Confinement:** C **Channel Gradient (range):** 5 to > 10 **Flow Regime:** Intermittent

## Fisheries Data

**Gear Used:** Not Fished **Effort (min):** N/A **Transect Length (m):** N/A

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | N | N |
| **NNST** | N | N | N | N |

## Comments & Summary

This crossing is on the same stream as rail crossing CV-91-0. The stream is shallow and steep, and had intermittent surface water downstream of the crossing in 2018 with no connections to overwintering waterbodies. There is no fish use of habitat at this crossing.

## Photographs

**A**

**B**

**Figure 1.** Views of CV-020-2 at the road diversion crossing during summer (A) and fall (B).

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char – NOT FISH-BEARING**<br>**Ninespine Stickleback – NOT FISH-BEARING** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversions BG-13-1 & BG-14-1 **Dates Surveyed:** 10 July & 30 August, 2018 **UTM Coordinates:** 17 W 551001 7917116 & 17 W 550839 7917414

## General Physical Characteristics

**Channel Confinement:** C **Channel Gradient (range):** 1-3° **Flow Regime:** Open Water

## Hydrology & Habitat Characteristics

| Site | Channel Width (m) | | Water Depth (m) (Summer/Fall) | | | | Water Velocity (m/s) (Summer/Fall) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bankfull | Wetted | 25% | 50% | 75% | Max | 25% | 50% | 75% | Max |
| BG-14-1 Crossing | 15.2 | 9.3 / 9.8 | 0.14 / 0.14 | 0.16 / 0.06 | 0.18 / 0.02 | 0.25 / 0.20 | 0.14 / 0.19 | 0.19 / 0.17 | 0.02 / 0.14 | 0.25 / 0.25 |
| BG-14-1 50 m US | 7.5 | 6.5 / - | - / - | 0.53 / - | - / - | 0.60 / - | - / - | 0.08 / - | - / - | 0.10 / - |
| BG-13-1 Crossing | 7.0 | 6.0 / 5.8 | 0.38 / - | 0.24 / - | 0.33 / - | 0.45 / 0.35 | 0.18 / - | 0.15 / - | 0.09 / - | 0.20 / 0.20 |

| Site | Stream Morphology Composition (%) | | | | | | Substrate Composition (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Riffle | Pool (<0.2 m) | Pool (>0.2 m) | Run | Cascade | Other | Fines | Gravel | Small Cobble | Large Cobble | Boulders |
| BG-14-1 Crossing | 55 | 20 | 5 | 20 | - | - | - | 10 | 90 | - | - |
| BG-14-1 50 m US | 10 | 45 | 45 | - | - | - | 40 | 10 | 40 | 10 | |
| BG-13-1 Crossing | 5 | 55 | 40 | - | - | - | 25 | 5 | 70 | - | |

**Baffinland Iron Mines**
**Mary River Project**

North/South Consultants Inc.
Aquatic Environment Specialists

**Fish Habitat Quality**

**Arctic Char - IMPORTANT**
**Ninespine Stickleback – IMPORTANT**

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversions BG-13-1 & BG-14-1 **Dates Surveyed:** 10 July & 30 August, 2018 **UTM Coordinates:** 17 W 551001 7917116 & 17 W 550839 7917414

## Fisheries Data

**Gear Used:** Backpack Electrofisher **Transect length (m):** N/A

| Species | Season | Effort (min) | Total Caught/Observed | CPUE | Length Range (mm) |
|---|---|---|---|---|---|
| **ARCH** | Summer | 6.82 | 9 | 1.32 | 29 - 126 |
| | Fall | - | N/A | N/A | N/A |
| **NNST** | Summer | 6.82 | 0 | - | N/A |
| | Fall | - | N/A | N/A | N/A |

## Fish Habitat Potential

| Species | Spawning | Overwintering | Rearing | Migration Corridor |
|---|---|---|---|---|
| **ARCH** | N | N | H | H |
| **NNST** | M | N | H | M |

## Comments & Summary

These two road diversion crossings are on the same stream as rail crossing CV-96-1 (see that assessment for more habitat details). The stream consistently provides important fish habitat for both species throughout the open-water period. The stream also connects two large, upstream lakes with David Lake downstream, representing a potentially important migratory route.

| | | | |
|---|---|---|---|
| **Baffinland Iron Mines Mary River Project** | North/South Consultants Inc. Aquatic Environment Specialists | **Fish Habitat Quality** | **Arctic Char - IMPORTANT**<br>**Ninespine Stickleback – IMPORTANT** |

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversions BG-13-1 & BG-14-1

**Dates Surveyed:** 10 July & 30 August, 2018

**UTM Coordinates:** 17 W 551001 7917116 & 17 W 550839 7917414

## Photographs

**A** **B** **C**

**Figure 1.** Summer (top) and fall (bottom) views of BG-14-1 at the road diversion crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversions BG-13-1 & BG-14-1

**Dates Surveyed:** 10 July & 30 August, 2018

**UTM Coordinates:** 17 W 551001 7917116 & 17 W 550839 7917414

## Photographs

**NO PHOTO**

**A**

**NO PHOTO**

**B**

**NO PHOTO**

**C**

**Figure 2.** Summer (top) and fall (bottom) views of BG-14-1 at 50 m upstream of the road diversion crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

# Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

## Location

**Crossing ID:** Road Diversions BG-13-1 & BG-14-1 **Dates Surveyed:** 10 July & 30 August, 2018 **UTM Coordinates:** 17 W 551001 7917116 & 17 W 550839 7917414

## Photographs

**A** **B** **C**

**Figure 3.** Summer (top) and fall (bottom) views of BG-13-1 at the road diversion crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.