Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-77-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535267 7918560

Photographs

A B C

Figure 5. Summer (top) and fall (bottom) views of CV-77-2 at the 20 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: CV-77-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535267 7918560

Photographs

A B C

Figure 6. Summer (top) and fall (bottom) views of CV-77-2 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-77-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535267 7918560

Photographs

A B C

Figure 7. Summer (top) and fall (bottom) views of CV-77-2 at the 20 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-77-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535267 7918560

Photographs

A **B** **C**

Figure 8. Summer (top) and fall (bottom) views of CV-77-2 at the 40 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-77-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535267 7918560

Photographs

A **B** **C**

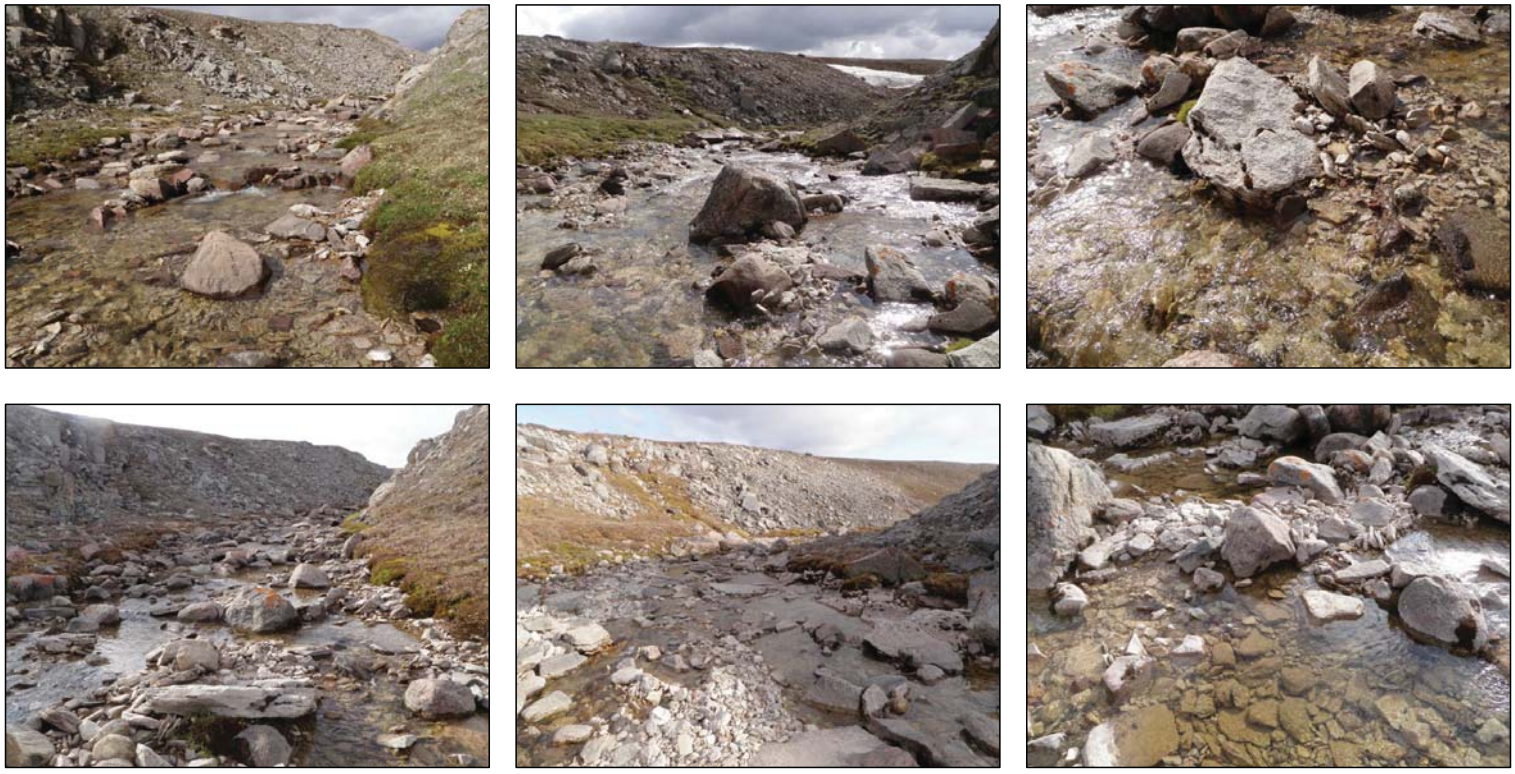
Figure 9. Summer (top) and fall (bottom) views of CV-77-2 at the 60 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-77-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535267 7918560

Photographs



A **B** **C**

Figure 10. Summer (top) and fall (bottom) views of CV-77-2 at the 80 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-77-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535267 7918560

Photographs

NO PHOTO

NO PHOTO

NO PHOTO

A **B** **C**

Figure 11. Summer (top) and fall (bottom) views of CV-77-2 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-77-3 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535497 7918521

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** 5 to > 15 **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

The crossing was small, but wetted in 2018. However a steep downstream gradient and lack of connectivity to overwintering habitat prevents access. There is no fish use of habitat at the crossing.

Photographs

A **B**

Figure 1. Views of CV-77-3 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-1 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535691 7918488

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **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

The crossing was a nearly dry, isolated low point on a hillside. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-78-1 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 535890 7918531

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **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

The crossing was a nearly dry, isolated low point on a hillside. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-78-2 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-3 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 536006 7918599

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** 5-12° **Flow Regime:** Intermittent

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	-	-	-	-	-	~0.10	-	-	-	~0.50

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	50	50	-	-	-	-	-	-	40	60	-

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-3 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 536006 7918599

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	L	N
NNST	N	N	M	N

Comments & Summary

There was no evidence of fish use of crossing habitat in 2018. The crossing area is shallow and steep, which is a probable barrier under most flow conditions. The nearest consistently usable fish habitat is at least 100 m downstream from the crossing where the gradient is lower and the water is deeper. The crossing may be used by juvenile char during periods of particularly high water.

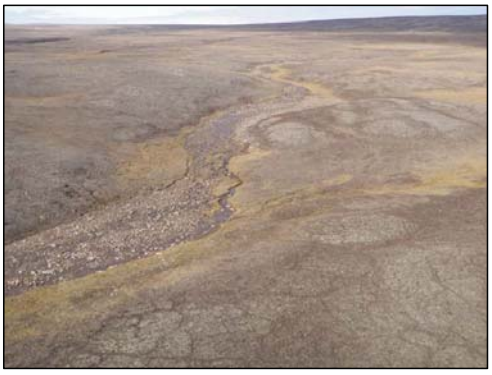
Baffinland Iron Mines Mary River Project	North/South Consultants Inc. Aquatic Environment Specialists	**Fish Habitat Quality**	**Arctic Char - NOT FISH-BEARING** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-3 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 536006 7918599

Photographs



A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-78-3 at the rail crossing. Fall (B) image shows the suitable downstream habitat while all others show a lack of habitat at and upstream of the crossing.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-4 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 536163 7918706

General Physical Characteristics

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

Fisheries Data

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

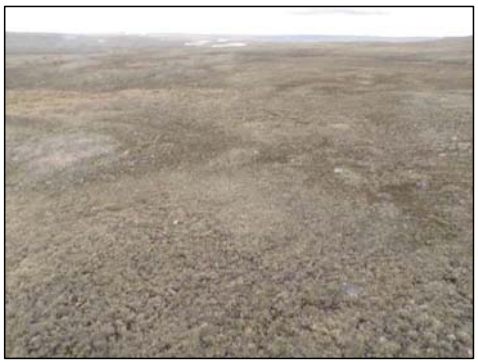
Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

The crossing was a dry low point on a hillside. There is no fish use of habitat at the crossing.

Photographs



A

B

Figure 1. Views of CV-78-4 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-5 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 536237 7918756

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **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

The crossing was a nearly dry low point on a hillside. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-78-5 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-78-6 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 536450 7918866

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 5-10 **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

There was a wetted channel at the crossing, but the channel disappeared downstream and water was subsurface. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-78-6 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-79-0 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 537243 7919138

General Physical Characteristics

Channel Confinement: PC **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

The crossing was steep, though flows were maintained during the open-water period in 2018. However, downstream closer to the confluence with a large river, the channel disappeared and flows spread across and under the tundra. There is no fish use of habitat at the crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-79-0 at the crossing during summer (A) and fall (B), and a downstream view of the stream with subsurface flows (C).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-79-1 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 537418 7919175

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **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

This was a dry spot adjacent to the CV-80-1 fish-bearing stream. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. View of CV-79-1 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 4-5° **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	6.0	3.8 / 2.1	- / 0.12	0.10 / -	- / 0.05	0.15 / 0.15	- / 0.14	0.28/ -	- / 0.13	0.30 / 0.20
80D	4.8	- / 3.2	- / 0.12	- / -	- / 0.14	- / 0.15	- / 0.35	- / -	- / 0.02	- / 0.35
60D	3.8	- / 3.4	- / 0.10	- / -	- / 0.06	- / 0.15	- / 0.17	- / -	- / 0.10	- / 0.20
50D	11.1	7.4 / -	- / -	0.16 / -	- / -	0.20 / -	- / -	0.03 / -	- / -	0.05 / -
40D	6.8	- / 2.6	- / -	- / 0.15	- / -	- / 0.15	- / -	- / 0.06	- / -	- / 0.10
20D	8.6	- / 4.6	- / 0.10	- / -	- / 0.04	- / 0.10	- / 0.28	- / -	- / 0.11	- / 0.30
0	6.9	2.5 / 2.4	- / 0.12	0.18 / -	- / 0.18	0.20 / 0.20	- / 0.04	0.30 / -	- / 0.40	0.30 / 0.40
20U	3.0	- / 2.4	- / 0.06	- / -	- / 0.12	- / 0.15	- / 0.13	- / -	- / 0.23	- / 0.25
40U	3.2	- / 2.7	- / 0.06	- / -	- / 0.12	- / 0.15	- / 0.30	- / -	- / 0.12	- / 0.30
50U	7.5	4.7 / -	- / -	0.06 / -	- / -	0.15 / -	- / -	0.35 / -	- / -	0.35 / -
60U	11.5	- / 8.3	- / 0.06	- / 0.04	- / 0.04	- / 0.10	- / 0.34	- / 0.12	- / 0.10	- / 0.35
80U	12.5	- / 10.0	- / 0.08	- / 0.08	- / 0.06	- / 0.10	- / 0.03	- / 0.05	- / 0.06	- / 0.10
100U	15.4	2.1 / 6.6	- / -	0.10 / 0.12	- / -	0.15 / 0.15	- / -	0.11 / 0.18	- / -	0.15 / 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
100D	40	60	-	-	-	-	-	5	80	15	-
80D	60	40	-	-	-	-	-	-	40	60	-
60D	50	50	-	-	-	-	-	-	50	50	-
50D	25	75	-	-	-	-	10	10	50	30	-
40D	-	100	-	-	-	-	90	-	-	10	-
20D	50	50	-	-	-	-	-	-	40	60	-
0	45	45	-	10	-	-	20	-	80	-	-
20U	70	30	-	-	-	-	-	-	60	40	-
40U	60	40	-	-	-	-	-	-	60	40	-
50U	50	50	-	-	-	-	-	5	60	35	-
60U	60	40	-	-	-	-	-	-	60	40	-
80U	60	40	-	-	-	-	-	-	60	40	-
100U	60	20	-	20	-	-	-	-	60	40	-

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Fisheries Data

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

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	3.57	3	0.84	137 - 163
	Fall	4.22	0	-	N/A
NNST	Summer	3.57	0	-	N/A
	Fall	4.22	0	-	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	M	N
NNST	N	N	N	N

Comments & Summary

Turbidity was very high during summer sampling due to erosion from the upstream Tote Road, which may have affected fish use of the stream and catch rates. This stream provides suitable rearing habitat for juvenile char throughout the open-water season, particularly during summer, but turbidity and a layer of loose sediment covering existing substrate may reduce usage.

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: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

A B C

Figure 1. Summer (top) and fall (bottom) views of CV-80-1 at the 100 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: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A

B

C

Figure 2. Summer (top) and fall (bottom) views of CV-80-1 at the 80 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: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 3. Summer (top) and fall (bottom) views of CV-80-1 at the 60 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: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO

NO PHOTO

NO PHOTO

A **B** **C**

Figure 4. Summer (top) and fall (bottom) views of CV-80-1 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: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 5. Summer (top) and fall (bottom) views of CV-80-1 at the 40 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: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A

B

C

Figure 6. Summer (top) and fall (bottom) views of CV-80-1 at the 20 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: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

A B C

Figure 7. Summer (top) and fall (bottom) views of CV-80-1 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

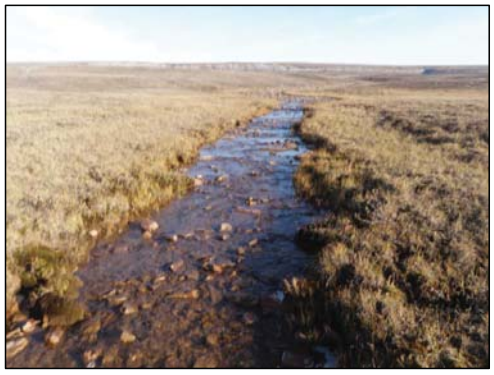
Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**



A

B

C

Figure 8. Summer (top) and fall (bottom) views of CV-80-1 at the 20 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 9. Summer (top) and fall (bottom) views of CV-80-1 at the 40 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO

NO PHOTO

NO PHOTO

A **B** **C**

Figure 10. Summer (top) and fall (bottom) views of CV-80-1 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A

B

C

Figure 11. Summer (top) and fall (bottom) views of CV-80-1 at the 60 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A

B

C

Figure 12. Summer (top) and fall (bottom) views of CV-80-1at the 80 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1 **Dates Surveyed:** 3 July & 2 September, 2018 **UTM Coordinates:** 17 W 537461 7919180

Photographs

A B C

Figure 13. Summer (top) and fall (bottom) views of CV-80-1 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-1a | **Dates Surveyed:** 3 July & 1 September, 2018 | **UTM Coordinates:** 17 W 537487 7919182

General Physical Characteristics

Channel Confinement: UC | **Channel Gradient (range):** N/A | **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 was a moist, grassy spot adjacent to CV-80-1. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. View of CV-80-1a at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-2, CV-80-2a & CV-80-2b

Dates Surveyed: 3 July & 1 September, 2018

UTM Coordinates: 17 W 538320 7919565, 17 W 538307 7919556 & 17 W 538334 7919573

General Physical Characteristics

Channel Confinement: UC

Channel Gradient (range): 5 to > 10

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

These are three branches of the same stream. The stream was shallow and steep, and surface flows disappeared downstream preventing all access. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-80-2, 80-2a, and 80-2b (from left to right in each photo) at the crossings 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-3 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 538453 7919642

General Physical Characteristics

Channel Confinement: PC **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 was a moist spot with no connections to other waterbodies. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-80-3 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-4 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 538510 7919675

General Physical Characteristics

Channel Confinement: PC **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 was barely wetted with many stretches of subsurface flows and no connections to other waterbodies. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-80-4 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-80-5 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 538604 7919729

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **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 was a nearly dry low point on a hillside. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-80-5 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-81-1 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 538691 7919779

General Physical Characteristics

Channel Confinement: UC **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 was a nearly dry marshy area. Most of the stream lacks a defined channel and there are multiple reaches with no surface flow. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-81-1 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-81-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 538879 7919924

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 5 to > 10 **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

There was a channel and sufficient flows at the crossing in 2018, but surface flows disappeared downstream and there was no connection to a pond or other waterbodies in the area. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-81-2 at the crossing during summer (A) and looking downstream during fall to show the loss of surface flow (B).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-81-3 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 538942 7920004

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 5 to > 10 **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

There was a very shallow, wide channel at the crossing in 2018, but surface flows disappeared downstream and there was no connection to other waterbodies in the area. There is no fish use of habitat at the crossing.

Photographs

A

B

Figure 1. Views of CV-81-3 near the crossing during summer, showing the lack of surface flow (A) and looking at the crossing during fall (B).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-81-4 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 539077 7920175

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 5 to > 10 **Flow Regime:** Open Water

Fisheries Data

Gear Used: Backpack Electrofisher **Effort (min):** 1.57 **Transect Length (m):** 100

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

The crossing was broad and shallow (max depth – 0.10 m) in 2018. No fish were captured or observed near the crossing. Fish were observed in deep pools near the confluence with a large downstream river. It is likely that the shallow, steep conditions at and near the crossing prevent all fish access to the area.

Photographs

A

B

C

Figure 1. Views of CV-81-4 near the crossing during summer, looking upstream (A) downstream (B) and across (C).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-81-4 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 539077 7920175

Photographs

A

Figure 2. View of CV-81-4 during fall.

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-82-1 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 539131 7920244

General Physical Characteristics

Channel Confinement: PC **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

The crossing was marshy habitat with intermittent surface flows and no connections to other waterbodies in 2018. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-82-1 near the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-82-1a | **Dates Surveyed:** 3 July & 1 September, 2018 | **UTM Coordinates:** 17 W 539242 7920376

General Physical Characteristics

Channel Confinement: UC | **Channel Gradient (range):** N/A | **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

The crossing was a dry low point. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-82-1a near the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-82-2 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 539376 7920489

General Physical Characteristics

Channel Confinement: PC **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

The crossing and entire stream was dry during 2018. There is likely no access to the crossing under any flow conditions. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-82-2 near the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-82-3 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 539508 7920599

General Physical Characteristics

Channel Confinement: PC **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

The crossing was an intermittently wet spot, with no surface water upstream and very little downstream. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-82-3 near the crossing during summer (A) and fall facing downstream (B).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-82-4 **Dates Surveyed:** 3 July & 1 September, 2018 **UTM Coordinates:** 17 W 539729 7920783

General Physical Characteristics

Channel Confinement: UC **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

The crossing was patches of shallow surface water with no flows or connections to other waterbodies. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-82-4 near the crossing during summer (A) and fall facing downstream (B).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-1 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 539835 7920871

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
100D	2.0	0.8 / 2.6	- / -	0.18 / 0.02	- / -	0.25 / 0.05	- / -	0.05 / 0.11	- / -	0.05 / 0.30
50D	3.0	1.3 / 0.6	- / -	0.54 / 0.16	- / -	0.55 / 0.16	- / -	0.01 / 0.13	- / -	0.01 / 0.15
0	3.6	0.8 / 3.8	- / -	0.15 / 0.08	- / -	0.25 / 0.15	- / -	0.03 / 0.13	- / -	0.03 / 0.15
50U	3.0	1.2 / 1.5	- / -	0.10 / 0.21	- / -	0.30 / 0.21	- / -	0.01 / 0.02	- / -	0.01 / 0.05
100U	2.5	1.5 / 2.0	- / -	0.18 / 0.52	- / -	0.55 / 0.55	- / -	0.01 / 0.00	- / -	0.01 / 0.01

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	-	80	20	-	-	-	100	-	-	-	-
50D	-	40	60	-	-	-	100	-	-	-	-
0	-	90	10	-	-	-	100	-	-	-	-
50U	-	75	25	-	-	-	100	-	-	-	-
100U	-	90	10	-	-	-	100	-	-	-	-

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: CV-83-1 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 539835 7920871

Fisheries Data

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

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	2.00	1	0.50	126
	Fall	2.02	0	-	N/A
NNST	Summer	2.00	0	-	N/A
	Fall	2.02	0	-	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	L	N
NNST	N	N	N	N

Comments & Summary

Deeper pools are separated by shallow grassy stretches that may limit juvenile char movements, particularly during periods of low water. Use is intermittent and habitat is marginal quality.

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: CV-83-1 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 539835 7920871

Photographs

A B C

Figure 1. Summer (top) and fall (bottom) views of CV-83-1 at the 100 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: CV-83-1 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 539835 7920871

Photographs

A B C

Figure 2. Summer (top) and fall (bottom) views of CV-83-1 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: CV-83-1 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 539835 7920871

Photographs

NO PHOTO

NO PHOTO

NO PHOTO

A **B** **C**

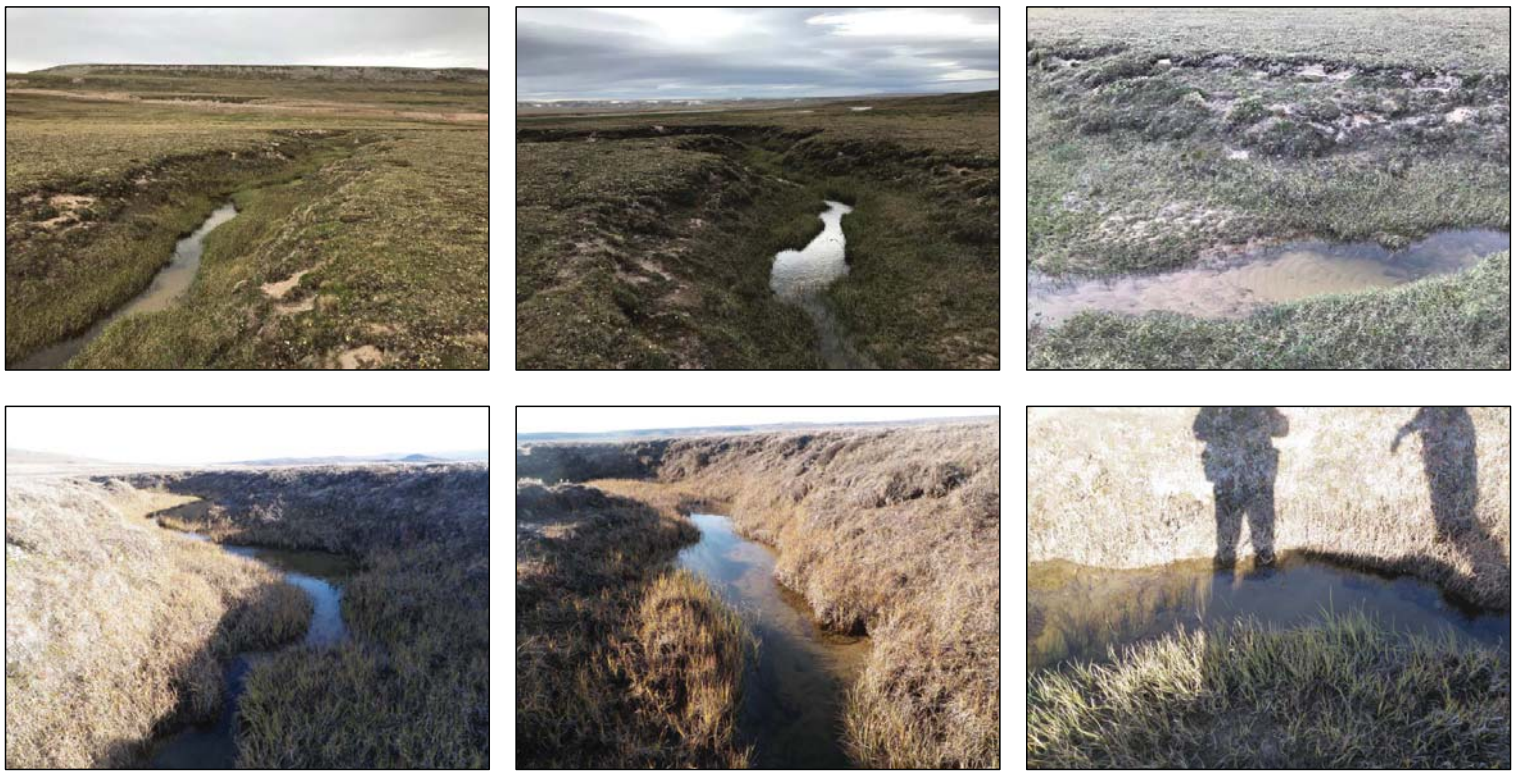
Figure 3. Summer (top) and fall (bottom) views of CV-83-1 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-1 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 539835 7920871

Photographs



A B C

Figure 4. Summer (top) and fall (bottom) views of CV-83-1 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-1 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 539835 7920871

Photographs

A B C

Figure 5. Summer (top) and fall (bottom) views of CV-83-1 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-1a | **Dates Surveyed:** 8 July & 2 September, 2018 | **UTM Coordinates:** 17 W 539887 7920915

General Physical Characteristics

Channel Confinement: UC | **Channel Gradient (range):** 2-5 | **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

The crossing was nearly dry, particularly during fall, with no connections to other waterbodies, probably under all flow conditions. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-83-1a near the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-2 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 540162 7921134

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
100D	3.8	2.2 / 2.3	- / -	0.12 / 0.48	- / -	0.50 / 0.50	- / -	0.02 / 0.02	- / -	0.02 / 0.02
50D	14.9	9.7 / 5.3	- / -	0.25 / 0.18	- / -	0.25 / 0.25	- / -	0.00 / 0.02	- / -	0.01 / 0.02
0	6.9	2.1 / 3.7	- / -	0.12 / 0.12	- / -	0.15 / 0.15	- / -	0.00 / 0.09	- / -	0.05 / 0.09
50U	16.9	7.9 / 9.0	- / -	0.14 / 0.08	- / -	0.15 / 0.15	- / -	0.00 / 0.03	- / -	0.01 / 0.05
100U	25.3	12.8 / 17.3	- / -	0.10 / 0.06	- / -	0.10 / 0.10	- / -	0.00 / 0.05	- / -	0.01 / 0.05

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	10	80	10	-	-	-	100	-	-	-	-
50D	-	80	20	-	-	-	100	-	-	-	-
0	10	90	-	-	-	-	100	-	-	-	-
50U	15	85	-	-	-	-	100	-	-	-	-
100U	5	95	-	-	-	-	100	-	-	-	-

Baffinland Iron Mines
Mary River Project

North/South Consultants Inc.
Aquatic Environment Specialists

Fish Habitat Quality

Arctic Char - NOT FISH-BEARING

Ninespine Stickleback – IMPORTANT

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-2 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 540162 7921134

Fisheries Data

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

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	3.35	0	-	N/A
	Fall	2.58	0	-	N/A
NNST	Summer	3.35	3	0.90	53 - 70
	Fall	2.58	8	3.10	YOY (< 20 mm)

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	H	N	H	L

Comments & Summary

Shallow water combined with fine, organic substrate limit the use of this stream by juvenile char, which were not captured in 2018, but it is important for spawning and rearing of Ninespine Stickleback.

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-2 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 540162 7921134

Photographs

A B C

Figure 1. Summer (top) and fall (bottom) views of CV-83-2 at the 100 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: CV-83-2 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 540162 7921134

Photographs

A B C

Figure 2. Summer (top) and fall (bottom) views of CV-83-2 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: CV-83-2 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 540162 7921134

Photographs

A B C

Figure 3. Summer (top) and fall (bottom) views of CV-83-2 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-2 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 540162 7921134

Photographs

A B C

Figure 4. Summer (top) and fall (bottom) views of CV-83-2 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-83-2 **Dates Surveyed:** 9 July & 2 September, 2018 **UTM Coordinates:** 17 W 540162 7921134

Photographs

A B C

Figure 5. Summer (top) and fall (bottom) views of CV-83-2 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 540842 7921510

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
100D	27.0	15.0 / 5.5	- / -	- / 0.35	- / -	0.40 / 0.35	- / -	- / 0.12	- / -	0.10 / 0.15
50D	5.0	5.0 / 3.9	- / -	1.10 / 2.30	- / -	>2.00 / 2.30	- / -	0.03 / 0.02	- / -	0.05 / 0.05
0	5.0	5.0 / 4.4	- / -	0.04 / 1.00	- / -	>2.00 / >2.00	- / -	0.30 / 0.00	- / -	0.30 / 0.15
50U	4.5	4.5 / 2.9	- / -	1.00 / 2.38	- / -	>2.00 / 2.40	- / -	0.21 / 0.07	- / -	0.25 / 0.15
100U	2.5	2.5 / 2.4	- / -	0.20 / 1.05	- / -	>2.00 / >2.00	- / -	0.02 / 0.14	- / -	0.10 / 0.15

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	-	20	20	-	-	60	100	-	-	-	-
50D	-	10	90	-	-	-	100	-	-	-	-
0	-	10	90	-	-	-	100	-	-	-	-
50U	-	10	90	-	-	-	100	-	-	-	-
100U	-	10	90	-	-	-	90	10	-	-	-

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: CV-84-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 540842 7921510

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	H	L
NNST	L	N	M	N

Comments & Summary

The very deep pools in this stream minimize the effectiveness of electrofishing. However, large numbers of juvenile char are observed every time monitoring is conducted on this Tote Road stream. Stickleback have also been captured during Tote Road surveys. This stream provides important, high-quality habitat for both species.

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: CV-84-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 540842 7921510

Photographs

A B C

Figure 1. Summer (top) and fall (bottom) views of CV-84-1 at the 100 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: CV-84-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 540842 7921510

Photographs

A B C

Figure 2. Summer (top) and fall (bottom) views of CV-84-1 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: CV-84-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 540842 7921510

Photographs

A **B** **C**

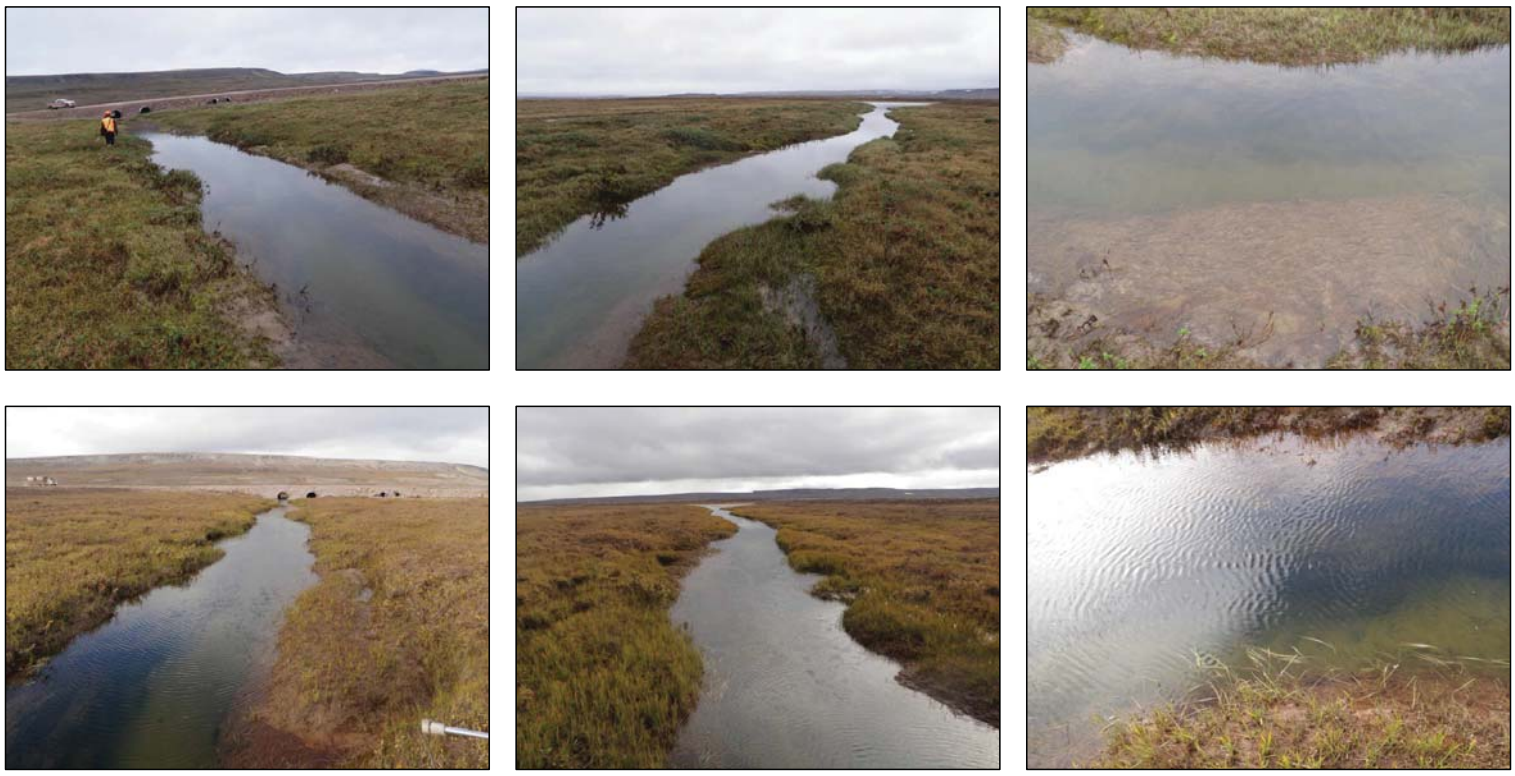
Figure 3. Summer (top) and fall (bottom) views of CV-84-1 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 540842 7921510

Photographs



A **B** **C**

Figure 4. Summer (top) and fall (bottom) views of CV-84-1 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 540842 7921510

Photographs

A **B** **C**

Figure 5. Summer (top) and fall (bottom) views of CV-84-1 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541030 7921642

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 1-3 **Flow Regime:** Intermittent

Fisheries Data

Gear Used: Backpack Electrofisher **Effort (min):** 0.95 **Transect Length (m):** 50

Fish Habitat Potential

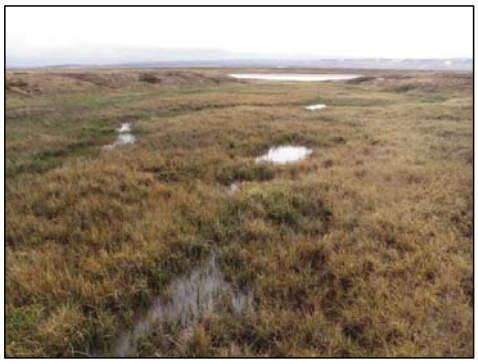
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

The crossing was a series of isolated pools with some nearly dry marshy, grassy areas in between. No fish were captured or observed in the isolated pools, indicating no upstream movements and subsequent stranding at peak freshet. There is likely no fish use of habitat at this crossing except under extreme high flows.

Photographs

A



B

C

Figure 1. Views of CV-84-2 at the crossing during summer, looking upstream (A) downstream (B) and across (C).

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

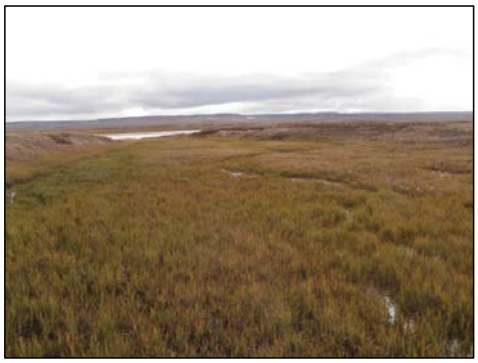
Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

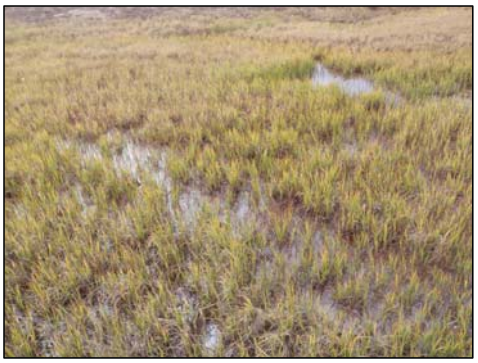
Crossing ID: CV-84-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541030 7921642

Photographs

A



B



C

Figure 2. Views of CV-84-2 at the crossing during fall, looking upstream (A) downstream (B) and across (C).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-3 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541294 7921948

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	LARGE DOWNSTREAM RIVER									
0	8.5	6.5 / 4.9	0.06 / -	- / 0.08	0.04 / -	0.10 / 0.10	0.07 / -	- / 0.28	0.15 / -	0.15 / 0.30
50U	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
100U	6.5	2.7 / 1.2	- / -	0.10 / 0.05	- / -	0.10 / 0.10	- / -	0.28 / 0.13	- / -	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	LARGE DOWNSTREAM RIVER										
0	40	40	-	-	-	20	90	5	5	-	-
50U	50	5	-	-	-	45	100	-	-	-	-
100U	50	5	-	-	-	45	100	-	-	-	-

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-3 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541294 7921948

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

There was no evidence of fish use of crossing 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-3 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541294 7921948

Photographs

NO PHOTO

A

NO PHOTO

B

NO PHOTO

C

Figure 1. Summer (top) views of CV-84-3 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across. Fall photos were not taken at this transect.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-3 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541294 7921948

Photographs

A B C

Figure 2. Summer (top) and fall (bottom) views of CV-84-3 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-84-3 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541294 7921948

Photographs

A **B** **C**

Figure 3. Summer (top) and fall (bottom) views of CV-84-3 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541514 7922054

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

The crossing is known to be not fish-bearing from Tote Road surveys. There is some ponding upstream of the road due to the small diameter, elevated culvert installed at a natural drop upstream from a major river. There is no fish use of habitat at this crossing.

Photographs

A

B

C

Figure 1. Views of CV-85-1 at the crossing during summer, looking upstream (A) downstream (B) and across (C).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541514 7922054

Photographs

A

B

C

Figure 2. Views of CV-85-1 at the crossing during fall, looking upstream (A) downstream (B) and across (C).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541921 7922236

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
100D	LARGE DOWNSTREAM RIVER									
50D	9.0	- / 6.0	0.04 / -	- / 0.07	0.02 / -	0.05 / 0.10	- / -	- / 0.27	- / -	- / 0.30
0	7.5	5.8 / 5.8	0.04 / -	- / 0.07	0.02 / -	0.05 / 0.10	0.01 / -	- / 0.18	0.16 / -	0.20 / 0.20
50U	2.9	2.4 / 2.3	0.02 / -	0.02 / 0.06	0.06 / -	0.10 / 0.10	0.08 / -	0.09 / 0.14	0.07 / -	0.10 / 0.15
100U	4.3	2.3 / 1.8	0.06 / -	- / 0.10	0.02 / -	0.10 / 0.10	0.38 / -	- / 0.20	0.16 / -	0.40 / 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
100D	LARGE DOWNSTREAM RIVER										
50D	40	20	-	-	-	40	95	5	-	-	-
0	20	15	-	-	-	65	100	-	-	-	-
50U	5	20	-	-	-	75	100	-	-	-	-
100U	20	5	-	-	-	75	100	-	-	-	-

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541921 7922236

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

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).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541921 7922236

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-85-2 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: CV-85-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541921 7922236

Photographs

A B C

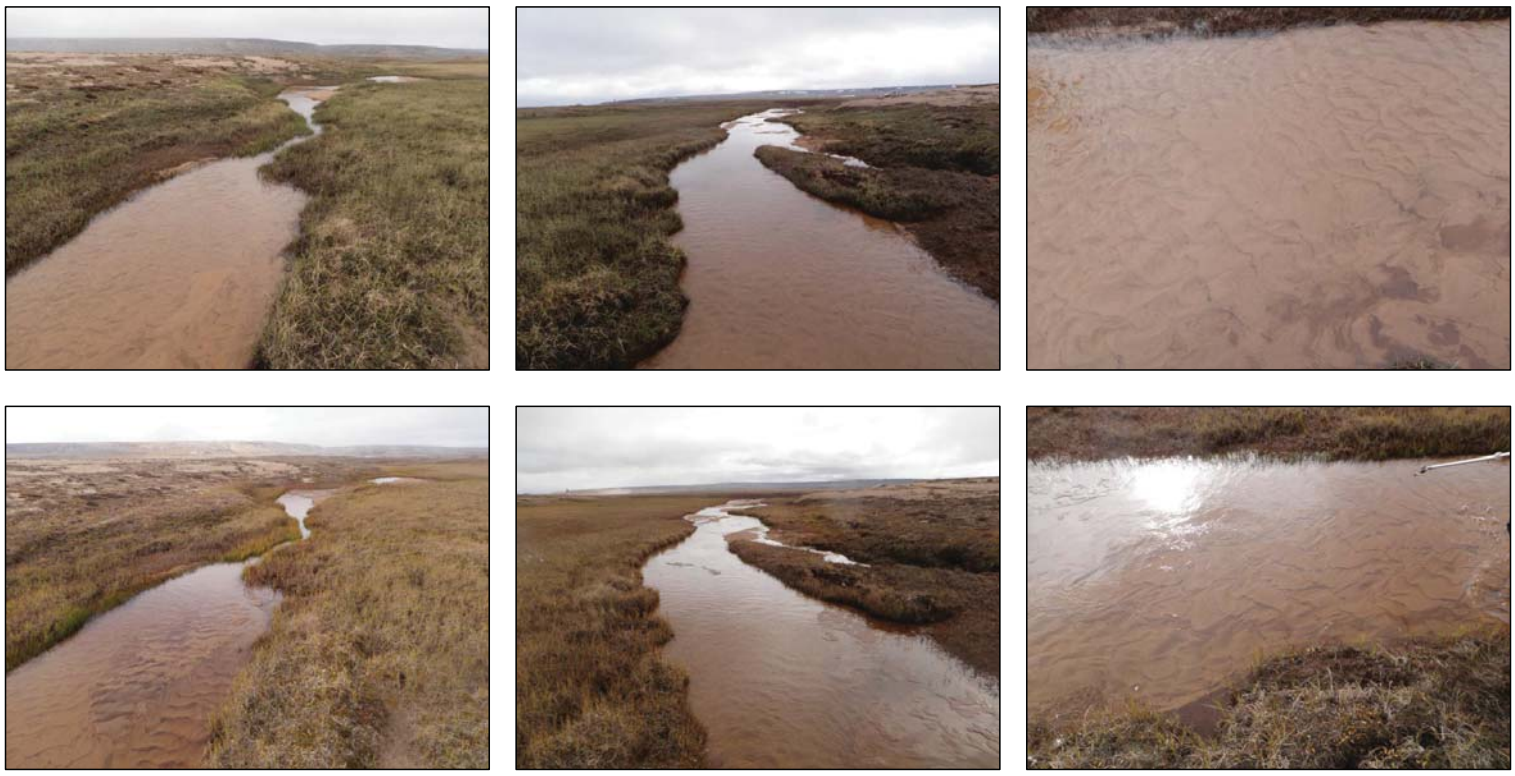
Figure 2. Summer (top) and fall (bottom) views of CV-85-2 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541921 7922236

Photographs



A **B** **C**

Figure 3. Summer (top) and fall (bottom) views of CV-85-2 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 541921 7922236

Photographs

A B C

Figure 4. Summer (top) and fall (bottom) views of CV-85-2 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-85-3 & CV-85-4

Dates Surveyed: 9 July & 27 August, 2018

UTM Coordinates: 17 W 542213 7922215&
17 W 542288 7922156

General Physical Characteristics

Channel Confinement: PC

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
60D	100.0	- / 90.0	- / 0.25	- / -	- / -	- / >0.50	- / 0.00	- / -	- / -	- / >0.50
40D	105.0	- / 98.0	- / 0.30	- / -	- / -	- / >0.50	- / 0.00	- / -	- / -	- / >0.50
20D	119.0	- / 107.0	- / 0.30	- / -	- / -	- / >0.50	- / 0.00	- / -	- / -	- / >0.50
0	119.0	- / 110.0	0.44 / 0.30	- / -	- / -	0.60 / >0.50	0.44 / 0.00	- / -	- / -	>0.50 / >0.50
20U	MURIEL LAKE									

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
60D	-	25	25	50	-	-	90	10	-	-	-
40D	-	25	25	50	-	-	80	10	10	-	-
20D	-	25	25	50	-	-	80	10	10	-	-
0	-	20	20	60	-	-	80	10	10	-	-
20U	MURIEL LAKE										

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: CV-85-3 & CV-85-4

Dates Surveyed: 9 July & 27 August, 2018

UTM Coordinates: 17 W 542213 7922215&
17 W 542288 7922156

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	H	H
NNST	N	N	L	L

Comments & Summary

The large size of this river, combined with a lack of cobble substrates (which char use for cover), decrease the effectiveness of backpack electrofishing. Char use of this river, both juveniles and adults, has been observed on multiple occasions during annual Tote Road monitoring. Stickleback have also been captured near the existing Tote Road bridge crossing.

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: CV-85-3 & CV-85-4

Dates Surveyed: 9 July & 27 August, 2018

UTM Coordinates: 17 W 542213 7922215& 17 W 542288 7922156

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A

B

C

Figure 1. Summer (top) and fall (bottom) views of CV-85-3 & CV-85-4 at the 60 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: CV-85-3 & CV-85-4

Dates Surveyed: 9 July & 27 August, 2018

UTM Coordinates: 17 W 542213 7922215&
17 W 542288 7922156

Photographs

NO PHOTO

NO PHOTO

NO PHOTO

A

B

C

Figure 2. Summer (top) and fall (bottom) views of CV-85-3 & CV-85-4 at the 40 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: CV-85-3 & CV-85-4

Dates Surveyed: 9 July & 27 August, 2018

UTM Coordinates: 17 W 542213 7922215&
17 W 542288 7922156

Photographs

NO PHOTO

NO PHOTO

NO PHOTO

A

B

C

Figure 3. Summer (top) and fall (bottom) views of CV-85-3 & CV-85-4 at the 20 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: CV-85-3 & CV-85-4

Dates Surveyed: 9 July & 27 August, 2018

UTM Coordinates: 17 W 542213 7922215& 17 W 542288 7922156

Photographs

A B C

Figure 4. Summer (top) and fall (bottom) views of CV-85-3 & CV-85-4 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-86-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542671 7921780

General Physical Characteristics

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

Fisheries Data

Gear Used: Backpack Electrofisher **Effort (min):** 2.15 **Transect Length (m):** 100

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 pond with a maximum depth of approximately 1.0 m. Fish were not captured or observed in 2018 despite fishing most of its shoreline. There is no fish use of habitat at this crossing.

Photographs

A **B** **C**

Figure 1. Views of CV-86-1 at the crossing during summer (A) and fall (B) and (C).

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-86-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542753 7921708

General Physical Characteristics

Channel Confinement: PC **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
100D	45.7	- / 39.3	0.04 / -	- / 0.19	0.02 / -	0.05 / 0.20	- / -	- / 0.00	- / -	- / 0.05
50D	39.3	- / 11.2	0.04 / -	- / 0.21	0.02 / -	0.25 / 0.25	0.01 / -	- / 0.08	0.16 / -	0.20 / 0.10
0	38.6	22.4 / 16.3	0.06 / -	0.06 / 0.06	0.05 / -	0.10 / 0.10	0.14 / -	0.20 / 0.13	0.14 / -	0.20 / 0.15
50U	29.4	15.2 / 10.4	0.03 / -	0.06 / 0.11	0.04 / -	0.10 / 0.12	0.17 / -	0.18 / 0.34	0.06 / -	0.20 / 0.35
100U	23.6	4.0 / 7.5	0.06 / 0.06	0.02 / -	0.04 / 0.18	0.10 / 0.20	0.12 / 0.14	0.05 / -	0.20 / 0.28	0.25 / 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
100D	-	100	-	-	-	-	100	-	-	-	-
50D	-	85	5	-	-	10	100	-	-	-	-
0	45	5	-	-	-	50	95	5	-	-	-
50U	40	15	-	-	-	45	90	5	5	-	-
100U	30	15	-	-	-	55	95	5	-	-	-

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-86-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542753 7921708

Fisheries Data

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

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	1.42	11	7.76	51 - 101
	Fall	-	N/A	N/A	N/A
NNST	Summer	1.42	5	3.53	26 - 59
	Fall	-	N/A	N/A	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	H	L
NNST	H	N	H	H

Comments & Summary

Although generally shallow with fine substrates, fish were captured in occasional deeper pools and areas with vegetation. All juvenile char in 2018 were captured in the scour pool downstream of the Tote Road culvert. The proximity to Muriel Lake promotes use of this stream by both species. Provides important habitat for stickleback spawning and rearing, and marginal to important habitat for rearing of smaller juvenile char.

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-86-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542753 7921708

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-86-2 at the 100 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: CV-86-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542753 7921708

Photographs

NO PHOTO **NO PHOTO** **NO PHOTO**

A **B** **C**

Figure 2. Summer (top) and fall (bottom) views of CV-86-2 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: CV-86-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542753 7921708

Photographs

A **B** **C**

Figure 3. Summer (top) and fall (bottom) views of CV-86-2 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-86-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542753 7921708

Photographs

A **B** **C**

Figure 4. Summer (top) and fall (bottom) views of CV-86-2 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-86-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 542753 7921708

Photographs

A **B** **C**

Figure 5. Summer (top) and fall (bottom) views of CV-86-2 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-1 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543078 7921473

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **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

The crossing is a nearly dry puddle. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-87-1 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-2 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543392 7921247

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** N/A **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

The crossing is a nearly dry puddle. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-87-2 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-3 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543532 7921170

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 0-1 **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

The crossing is an isolated puddle/pond with no connection to other waterbodies. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-87-3 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-4 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543736 7921141

General Physical Characteristics

Channel Confinement: C **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
100D	8.1	2.9 / 0.9	- / -	0.05 / 0.07	- / -	0.10 / 0.20	- / -	0.37 / 0.27	- / -	0.40 / 0.30
50D	1.5	0.6 / 1.3	- / -	0.05 / 0.31	- / -	0.30 / 0.35	- / -	0.23 / 0.00	- / -	0.25 / 0.15
0	1.5	0.3 / 1.4	- / -	0.14 / 0.28	- / -	0.20 / 0.30	- / -	0.46 / 0.00	- / -	0.50 / 0.20
50U	18.8	7.0 / 4.2	- / -	0.03 / 0.04	- / -	0.10 / 0.10	- / -	0.09 / 0.19	- / -	0.15 / 0.20
100U	7.3	5.8 / 1.7	- / -	0.06 / 0.03	- / -	0.10 / 0.10	- / -	0.14 / 0.18	- / -	0.15 / 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
100D	50	15	-	-	-	35	90	10	-	-	-
50D	30	35	5	-	-	30	100	-	-	-	-
0	50	40	-	-	-	10	100	-	-	-	-
50U	-	30	-	-	-	70	100	-	-	-	-
100U	-	10	-	-	-	90	100	-	-	-	-

Baffinland Iron Mines
Mary River Project

North/South Consultants Inc.
Aquatic Environment Specialists

Fish Habitat Quality

Arctic Char - NOT FISH-BEARING

Ninespine Stickleback – NOT FISH-BEARING

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-4 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543736 7921141

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

A silt curtain was blocking entrance to this stream from Muriel Lake at the time of the summer survey, so fishing was not conducted, but previous surveys during Tote Road studies identified stickleback and juvenile char in this stream.

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-4 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543736 7921141

Photographs

A B C

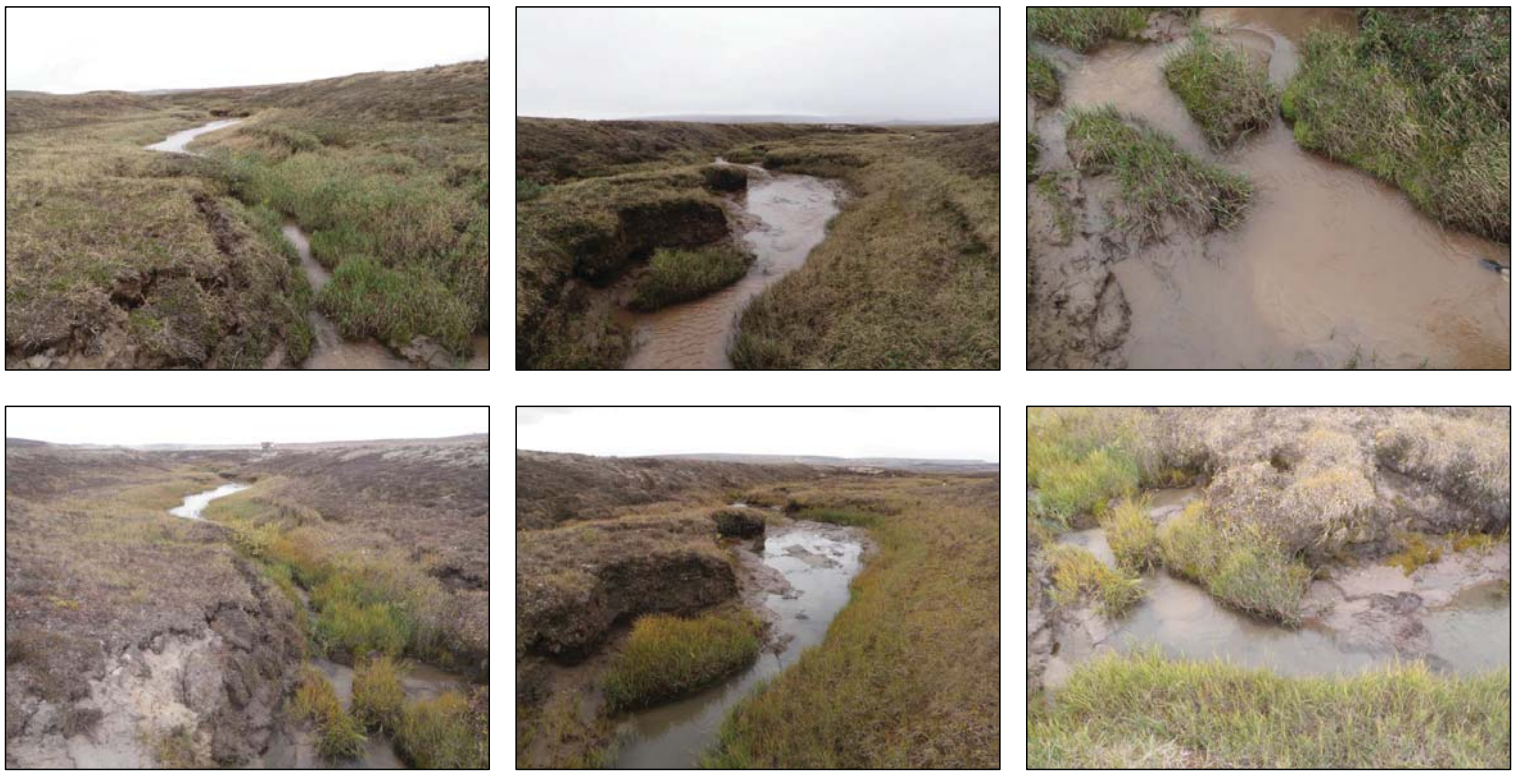
Figure 1. Summer (top) and fall (bottom) views of CV-87-4 at the 100 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-4 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543736 7921141

Photographs



A **B** **C**

Figure 2. Summer (top) and fall (bottom) views of CV-87-4 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: CV-87-4 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543736 7921141

Photographs

A B C

Figure 3. Summer (top) and fall (bottom) views of CV-87-4 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-4 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543736 7921141

Photographs

A B C

Figure 4. Summer (top) and fall (bottom) views of CV-87-4 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-87-4 **Dates Surveyed:** 9 July & 27 August, 2018 **UTM Coordinates:** 17 W 543736 7921141

Photographs

A **B** **C**

Figure 5. Summer (top) and fall (bottom) views of CV-87-4 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-1 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 543976 7921204

General Physical Characteristics

Channel Confinement: UC **Channel Gradient (range):** 0-1 **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

The crossing is moist terrestrial with no surface water. There is no fish use of habitat at this crossing.

Photographs

A

B

Figure 1. Views of CV-88-1 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-2 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544209 7921282

General Physical Characteristics

Channel Confinement: PC **Channel Gradient (range):** 5-12° **Flow Regime:** Intermittent

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	-	-	-	-	-	~0.10	-	-	-	~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
0	10	90	-	-	-	-	100	-	-	-	-

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-2 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544209 7921282

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	L	N
NNST	N	N	N	N

Comments & Summary

This stream is shallow and only has intermittent connection to CV-88-3 downstream (none at the time of 2018 surveys). Crossing area may be used by juvenile char during periods of particularly high water.

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-2 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544209 7921282

Photographs

A **B** **C**

Figure 1. Summer (top) and fall (bottom) views of CV-88-2 at the rail crossing.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-3 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544259 7921299

General Physical Characteristics

Channel Confinement: C **Channel Gradient (range):** 1-3° **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
100D	13.5	4.2 / 0.6	0.02 / -	- / 0.04	0.01 / -	0.05 / 0.05	0.17 / -	- / 0.19	0.05 / -	0.20 / 0.20
50D	11.2	1.7 / 0.3	- / -	0.03 / 0.04	- / -	0.05 / 0.05	- / -	0.14 / 0.15	- / -	0.20 / 0.20
0	1.5	0.6 / 1.4	- / -	0.08 / 0.20	- / -	0.15 / 0.20	- / -	0.09 / 0.07	- / -	0.15 / 0.15
50U	3.0	0.9 / 1.9	- / -	0.10 / 0.06	- / -	0.10 / 0.10	- / -	0.05 / 0.03	- / -	0.10 / 0.10
100U	7.0	1.0 / 0.7	- / -	0.02 / 0.02	- / -	0.05 / 0.05	- / -	0.04 / 0.07	- / -	0.05 / 0.10

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	75	25	-	-	-	-	75	15	10	-	-
50D	80	15	-	-	-	5	70	25	5	-	-
0	50	50	-	-	-	-	90	5	5	-	-
50U	10	90	-	-	-	-	100	-	-	-	-
100U	30	70	-	-	-	-	90	10	-	-	-

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-3 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544259 7921299

Fisheries Data

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

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	2.08	0	-	N/A
	Fall	2.02	0	-	N/A
NNST	Summer	2.08	0	-	N/A
	Fall	2.02	0	-	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

Fish were not captured or observed in 2018, but there was no obvious barrier between the crossing and downstream overwintering habitat. Distance from overwintering habitat and low water levels may limit use by fish, creating a soft barrier to fish access.

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

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-3 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544259 7921299

Photographs

A B C

Figure 1. Summer (top) and fall (bottom) views of CV-88-3 at the 100 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across. NOTE: summer and fall photos are estimated to be approximately 20 m apart due to malfunctioning GPS in summer.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-3 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544259 7921299

Photographs

A **B** **C**

Figure 2. Summer (top) and fall (bottom) views of CV-88-3 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: CV-88-3 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544259 7921299

Photographs

A B C

Figure 3. Summer (top) and fall (bottom) views of CV-88-3 at the rail crossing; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-3 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544259 7921299

Photographs

A **B** **C**

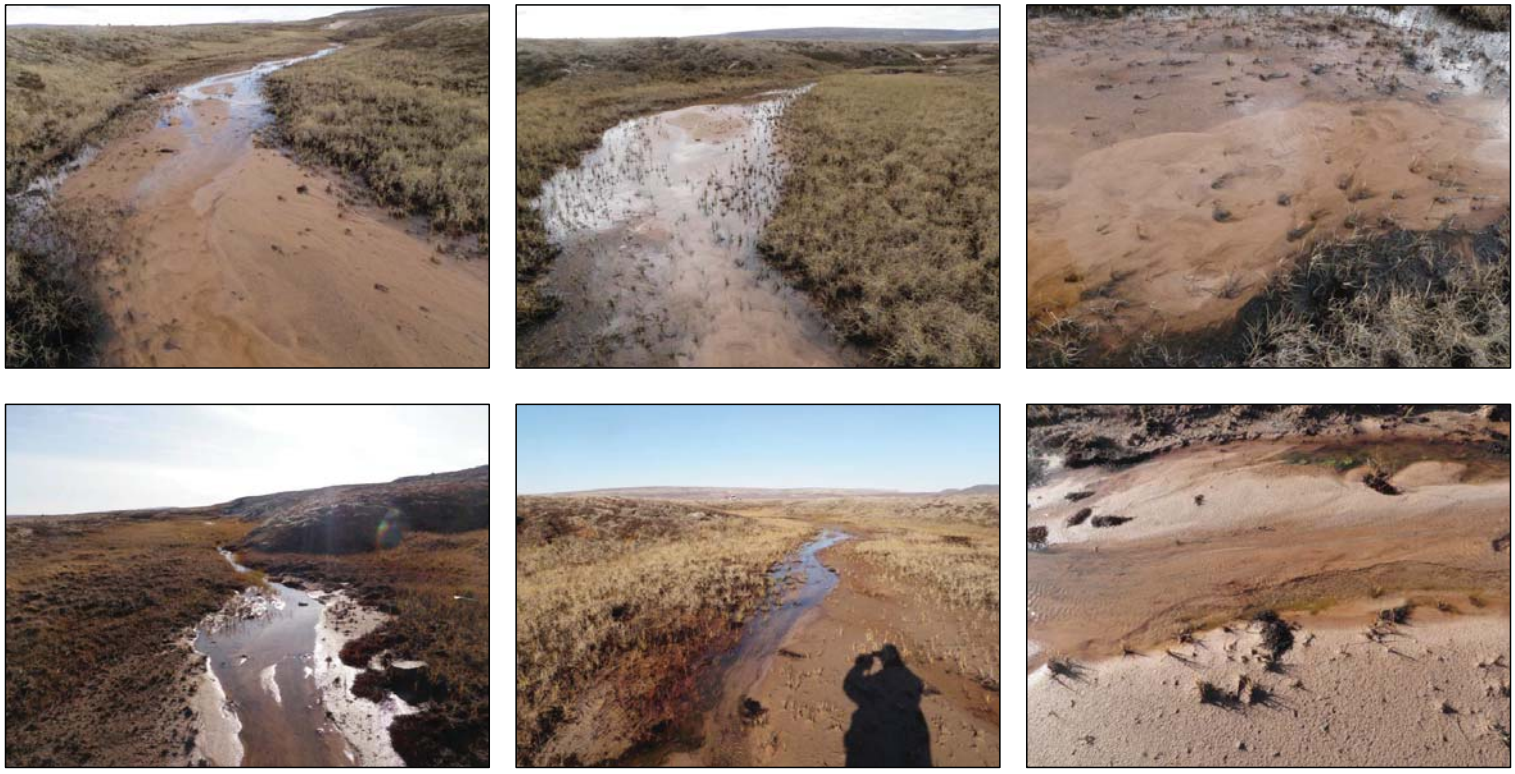
Figure 4. Summer (top) and fall (bottom) views of CV-88-3 at the 50 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-3 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 544259 7921299

Photographs



A **B** **C**

Figure 5. Summer (top) and fall (bottom) views of CV-88-3 at the 100 m upstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-88-4 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 545151 7921245

General Physical Characteristics

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

Fisheries Data

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

Fish Habitat Potential

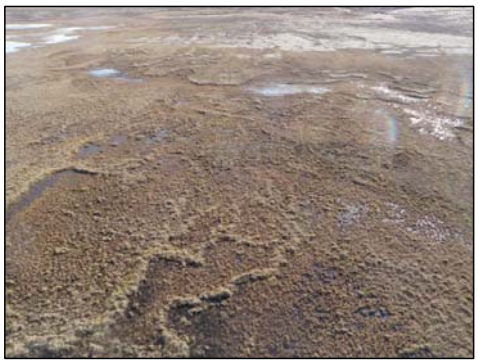
Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	N	N
NNST	N	N	N	N

Comments & Summary

The crossing is shallow, marshy, and unconnected to other waterbodies. There is no fish use of habitat at this crossing.

Photographs

A



B

Figure 1. Views of CV-88-4 at the 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** **Ninespine Stickleback – NOT FISH-BEARING**

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-89-1 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 545492 7921173

General Physical Characteristics

Channel Confinement: C **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	23.8	14.7 / 11.7	0.04 / 0.06	0.13 / 0.08	0.06 / 0.06	0.15 / 0.10	0.12 / 0.15	0.15/ 0.16	0.06 / 0.13	0.20 / 0.20
80D	22.0	14.2 / 15.2	0.12 / 0.10	0.12 / 0.20	0.10 / 0.13	0.15 / 0.20	0.05 / 0.01	0.08/ 0.12	0.12 / 0.10	0.20 / 0.20
60D	17.5	8.5 / 7.0	0.18 / 0.02	0.05 / -	0.04 / 0.14	0.20 / 0.15	0.25 / 0.04	0.12/ -	0.08 / 0.18	0.30 / 0.20
40D	17.7	11.8 / 11.3	0.10 / 0.08	0.10 / -	0.06 / 0.06	0.15 / 0.10	0.11 / 0.26	0.06/ -	0.10 / 0.13	0.15 / 0.30
20D	16.1	11.3 / 10.5	- / 0.10	0.06 / 0.05	- / 0.12	0.15 / 0.15	- / 0.14	0.17/ 0.29	- / 0.09	0.20 / 0.30
0	11.1	6.8 / 6.7	- / -	0.16 / 0.10	- / 0.10	0.20 / 0.15	- / -	0.25/ 0.07	- / 0.07	0.30 / 0.15
20U	9.0	5.8 / 7.2	- / 0.18	0.12 / 0.04	- / 0.06	0.15 / 0.20	- / 0.37	0.26/ 0.24	- / 0.15	0.30 / 0.40
40U	9.0	5.4 / 4.6	- / -	0.17 / 0.16	- / 0.10	0.20 / 0.20	- / -	0.14/ 0.10	- / 0.05	0.20 / 0.15
60U	10.8	9.5 / 4.9	- / 0.10	0.18 / -	- / 0.10	0.20 / 0.15	- / 0.19	0.15/ -	- / 0.28	0.20 / 0.30
80U	11.4	8.8 / 7.6	- / 0.08	0.16 / -	- / 0.12	0.20 / 0.15	- / 0.12	0.14/ -	- / 0.10	0.20 / 0.15
100U	8.5	4.8 / 2.5	- / 0.28	0.30 / -	- / 0.18	0.30 / 0.30	- / 0.20	- / -	- / 0.41	- / 0.50

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	25	75	-	-	-	-	50	10	40	-	-
80D	20	80	-	-	-	-	65	10	25	-	-
60D	20	80	-	-	-	-	65	10	25	-	-
40D	25	75	-	-	-	-	75	10	15	-	-
20D	50	50	-	-	-	-	65	15	20	-	-
0	35	65	-	-	-	-	50	25	25	-	-
20U	50	50	-	-	-	-	15	20	65	-	-
40U	30	70	-	-	-	-	15	30	55	-	-
60U	15	85	-	-	-	-	55	30	15	-	-
80U	15	85	-	-	-	-	70	15	15	-	-
100U	25	75	-	-	-	-	20	60	20	-	-

Phase 2 Milne Rail Corridor Aquatic Habitat Assessment

Location

Crossing ID: CV-89-1 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 545492 7921173

Fisheries Data

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

Species	Season	Effort (min)	Total Caught/Observed	CPUE	Length Range (mm)
ARCH	Summer	5.70	11	1.93	64 - 79
	Fall	3.71	3	0.81	42 - 111
NNST	Summer	5.70	1	0.18	46
	Fall	3.71	0	-	N/A

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	N	N	H	H
NNST	L	N	H	H

Comments & Summary

This stream flows between two fish-bearing lakes and provides abundant habitat for stickleback and juvenile char during the open water period, particularly in summer. Fall water temperatures at the time of sampling were low and many fish had likely already returned to overwintering lakes, affecting catches.

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

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Photographs

A B C

Figure 1. Summer (top) and fall (bottom) views of CV-89-1 at the 100 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: CV-89-1 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 545492 7921173

Photographs

A B C

Figure 2. Summer (top) and fall (bottom) views of CV-89-1 at the 80 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: CV-89-1 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 545492 7921173

Photographs

A B C

Figure 3. Summer (top) and fall (bottom) views of CV-89-1 at the 60 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: CV-89-1 **Dates Surveyed:** 4 July & 2 September, 2018 **UTM Coordinates:** 17 W 545492 7921173

Photographs

A **B** **C**

Figure 4. Summer (top) and fall (bottom) views of CV-89-1 at the 40 m downstream cross-section; (A) looking upstream; (B) looking downstream; and (C) looking across.