

TOTE ROAD CV-102

12-JUL-24



A

Photos 1-4. Photos taken of the culverts at the downstream end in spring 2024.

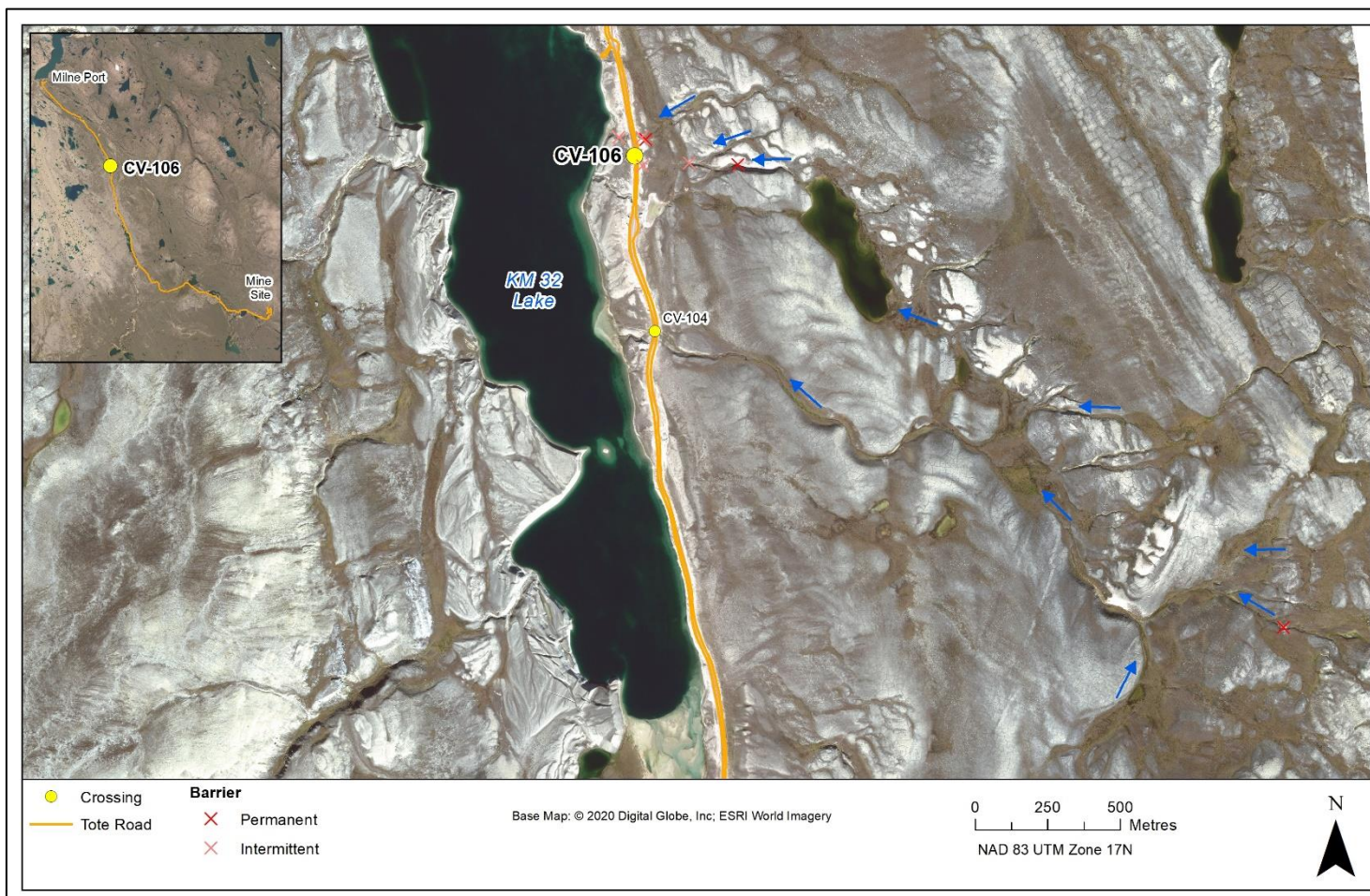
TOTE ROAD CV-106

LOCATION AND CROSSING DESCRIPTION

Site ID:	CV-106	Dates Surveyed:	12-Jul-24	Waterbody Type:	Stream
Project Interaction:	Tote Road Culvert	UTM Coordinates:	17W 521663 E 7953392 N		

GENERAL PHYSICAL CHARACTERISTICS

Flow Regime: Intermittent **Stream Order:** 2



BAFFINLAND IRON MINES
MARY RIVER PROJECT

 **North/South Consultants Inc.**
Aquatic Environment Specialists

FISH HABITAT:

ARCTIC CHAR - YES

NINESPINE STICKLEBACK - POTENTIAL

TOTE ROAD CV-106

SITE SUMMARY

The Tote Road crosses a small, unnamed stream at site CV-106 that flows 120 m west into Km 32 Lake. The lake is of sufficient depth to support overwintering of both species.

This crossing was remediated in winter 2023/2024. There is now a large, embedded fish passage culvert at the crossing, however the large aggregate material used in the apron and inside the culvert is too large for typical flows in this stream. As a result, by the site visit on 12 July, flows had become subsurface under the aprons and fish no longer had access to upstream habitat.

Detailed habitat data were collected in the crossing area in late spring 2024. Previous surveys have indicated this stream can become very shallow or completely dry by summer/fall, particularly during years with less precipitation. In spring 2024, this stream was narrow, shallow, and slow-moving. Wetted widths were typically <1.5 m. Water depths rarely exceeded 0.10 m, with a maximum measured depth of 0.13 m. Velocities were typically <0.35 m/s. There was no surface water within the apron footprint. Stream morphology was mostly riffle and run downstream and shallow pool upstream due to surface flows being impeded by the apron. In previous years, upstream morphology was similar to downstream. Substrate was primarily gravel/cobble with increased proportions of cobble in the apron on both sides of the culvert.

Three small juvenile Arctic Char were captured downstream of the apron in spring 2024. No fish were captured upstream of the crossing, suggesting that the flows may have become subsurface prior to fish moving into the stream. Char use habitat in the vicinity of the Tote Road crossing at CV-106 for rearing/feeding when water levels are sufficient. There is no char spawning or overwintering habitat in this stream.

Ninespine Stickleback were not captured in spring 2024 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-106

FISH HABITAT POTENTIAL

Species	Spawning	Overwintering	Rearing	Adults Present
ARCH	N	N	Y	N
NNST	P	N	P	P

FISHERIES DATA

Location	Species	Survey Date	Temperature (°C)	Distance Fished (m)	Effort (Seconds)	# Fish Captured	# Fish Observed	CPUE (No. Fish/60 Seconds)	Length Range (mm)
Downstream	ARCH	12-Jul-24	10.5	50	114	3	0	1.579	48-66
	NNST					0	0	0.00	-
Upstream	ARCH			50	89	0	0	0.00	-
	NNST					0	0	0.00	-

OTHER NOTES / OBSERVATIONS

Three small juvenile Arctic Char were captured downstream of the apron in spring 2024. No fish were captured upstream of the crossing, suggesting that the flows may have become subsurface prior to fish moving into the stream. Ninespine Stickleback were not captured in spring 2023 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-106

HYDROLOGY CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted Stage: Low

Site	Channel Width (m)		Water Depth (m)				Water Velocity (m/s)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
100D	2.20	1.30	-	0.06	-	0.07	-	0.18	-	0.36
60D	13.20	10.40	-	0.03	-	0.07	-	0.33	-	0.35
20D	2.90	0.44	-	0.05	-	0.05	-	0.25	-	0.25
0 (Centreline)	UNDER TOTE ROAD									
20U	SUBSURFACE UNDER APRON									
60U	1.10	0.32	-	0.03	-	0.03	-	0.00	-	0.10
100U	0.66	0.44	-	0.10	-	0.13	-	0.00	-	0.23

OTHER NOTES / OBSERVATIONS

In spring 2024, this stream was narrow, shallow, and slow-moving. Wetted widths were typically <1.5 m. Water depths rarely exceeded 0.10 m, with a maximum measured depth of 0.13 m. Velocities were typically <0.35 m/s. There was no surface water within the apron footprint (extends from approximately 10 m downstream to 30 m upstream).

TOTE ROAD CV-106

HABITAT CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Low

Site	Stream Morphology Composition (%)							Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Rapids	Flat	Fines	Gravel	Small Cobble	Large Cobble	Boulders
100D	50	20	-	30	-	-	-	20	30	45	5	-
60D	30	10	-	60	-	-	-	30	40	30	-	-
20D	20	20	-	60	-	-	-	20	40	40	-	-
0 (Centreline)	UNDER TOTE ROAD											
20U	SUBSURFACE UNDER APRON											
60U	10	90	-	-	-	-	-	70	25	5	-	-
100U	10	90	-	-	-	-	-	90	5	5	-	-

OTHER NOTES / OBSERVATIONS

Stream morphology was mostly riffle and run downstream and shallow pool upstream due to surface flows being blocked by the apron. In previous years, upstream morphology was similar to downstream. Substrate was primarily gravel/cobble with increased proportions of cobble in the apron on both sides of the culvert. There was no surface water within the apron footprint (extends from approximately 10 m downstream to 30 m upstream).

TOTE ROAD CV-106

12-JUL-24



A



B



C



D



E



F

Photos 1-1. Photos taken 20 m downstream (top) and 60 m downstream (bottom) in spring 2024: (A,D) facing upstream; (B,E) facing downstream; and (C,F) across (left bank looking at right bank).

TOTE ROAD CV-106

12-JUL-24



A



B



C

Photos 1-2. Photos taken 100 m downstream in spring 2024: (A) facing upstream; (B) facing downstream; and (C) across (left bank looking at right bank).

TOTE ROAD CV-106

12-JUL-24



A



B



C



D



E



F

Photos 1-3. Photos taken 20 m upstream (top) and 60 m upstream (bottom) in spring 2024: (A,D) facing upstream; (B,E) facing downstream; and (C,F) across (left bank looking at right bank).

TOTE ROAD CV-106

12-JUL-24



A



B



C

Photos 1-4. Photos taken 100 m upstream in spring 2024: (A) facing upstream; (B) facing downstream; and (C) across (left bank looking at right bank).

TOTE ROAD CV-106

12-JUL-24



A



B

Photos 1-5. Photos taken of the culverts in spring 2024: (A) downstream end; and (B) upstream end.

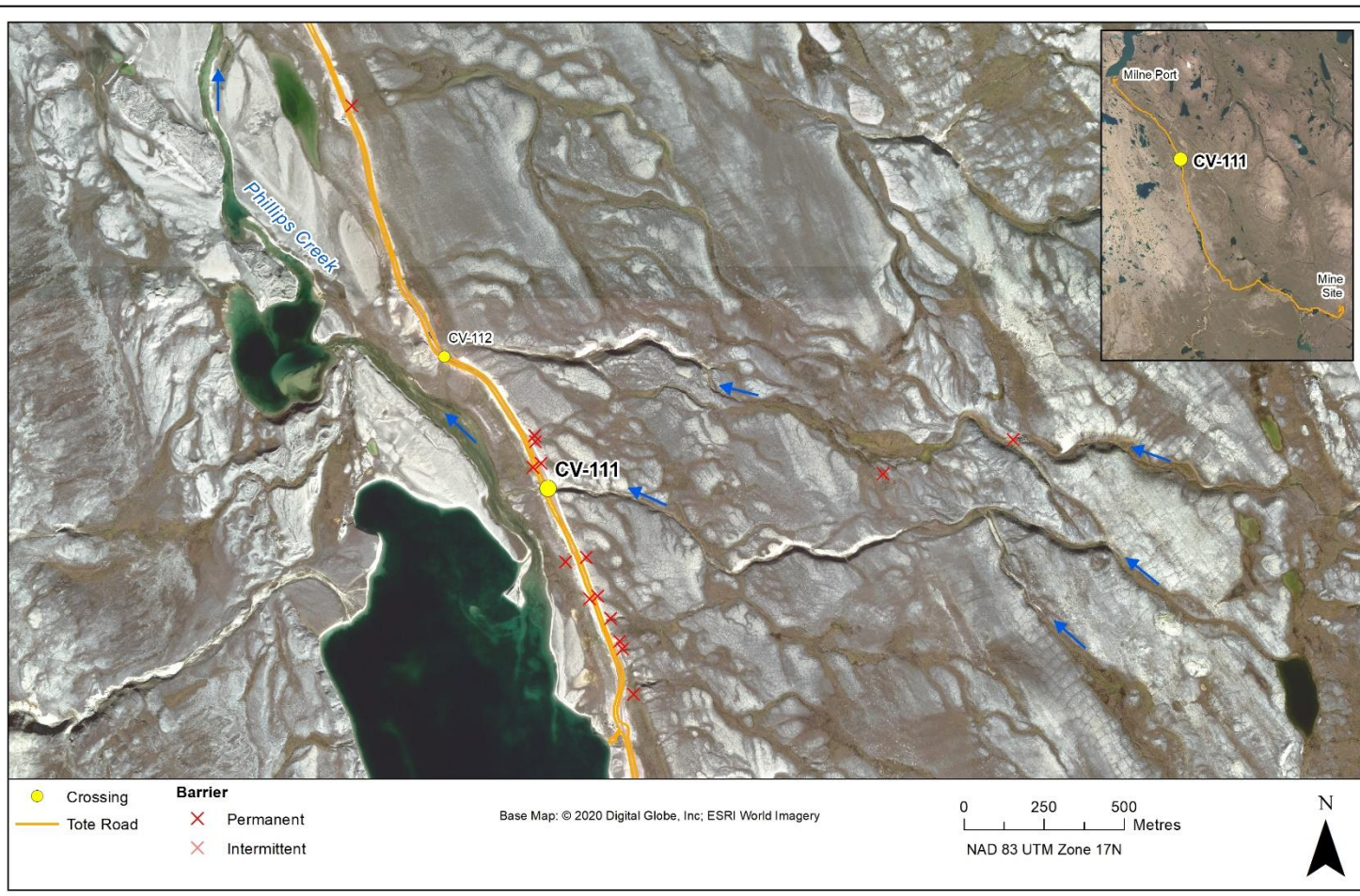
TOTE ROAD CV-111

LOCATION AND CROSSING DESCRIPTION

Site ID:	CV-111	Dates Surveyed:	12-Jul-24	Waterbody Type:	Stream
Project Interaction:	Tote Road Culvert	UTM Coordinates:	17W 521355 E 7954524 N		

GENERAL PHYSICAL CHARACTERISTICS

Flow Regime: Seasonal **Stream Order:** 3



BAFFINLAND IRON MINES
MARY RIVER PROJECT

 **North/South Consultants Inc.**
Aquatic Environment Specialists

FISH HABITAT:

ARCTIC CHAR - YES

NINESPINE STICKLEBACK - POTENTIAL

TOTE ROAD CV-111

SITE SUMMARY

The Tote Road crosses a small, unnamed stream at site CV-111 that flows 120 m west into Phillips Creek near its outflow from Km 32 Lake. The lake is of sufficient depth to support overwintering of both species. In addition, there are two small lakes >2.5 km upstream from the crossing, one of which has been confirmed to be of sufficient depth to support overwintering. Although a bathymetric survey of the second upstream lake has not been conducted it is also believed to be of sufficient depth to support overwintering. Juvenile char were captured along the shorelines of both upstream lakes in 2019. This crossing has been identified for remediation.

Detailed habitat data were collected in the crossing area in late spring 2024. The stream was narrow and shallow, with moderate water velocities. Wetted widths ranged from 2.3 to 6.4 m. Measured water depths were consistently <0.20 m, with a maximum of 0.18 m. Measured velocities ranged from 0.13-0.58 m/s. Stream morphology was mostly riffle and run throughout and substrate was primarily cobble.

Twenty-one small (43-98 mm) juvenile Arctic Char were captured downstream of the crossing in spring 2024. A single large (200 mm) juvenile was captured upstream. Char use habitat in the vicinity of the Tote Road crossing at CV-111 for rearing/feeding when water levels are sufficient. There is no char spawning or overwintering habitat in this stream. The culvert is currently perched (0.33 m) and is likely preventing most, if not all, fish access to upstream areas. It is likely that the char captured upstream originated from one of the upstream lakes.

Ninespine Stickleback were not captured in spring 2024 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-111

FISH HABITAT POTENTIAL

Species	Spawning	Overwintering	Rearing	Adults Present
ARCH	N	N	Y	N
NNST	P	N	P	P

FISHERIES DATA

Location	Species	Survey Date	Temperature (°C)	Distance Fished (m)	Effort (Seconds)	# Fish Captured	# Fish Observed	CPUE (No. Fish/60 Seconds)	Length Range (mm)
Downstream	ARCH	12-Jul-24	10.5	50	174	21	0	7.241	43-98
	NNST					0	0	0.00	-
Upstream	ARCH			50	146	1	0	0.411	200
	NNST					0	0	0.00	-

OTHER NOTES / OBSERVATIONS

Twenty-one small (43-98 mm) juvenile Arctic Char were captured downstream of the crossing in spring 2024. A single large (200 mm) juvenile was captured upstream. The culvert is currently perched (0.33 m) and is likely preventing most, if not all, fish access to upstream areas. It is likely that the char captured upstream originated from one of the upstream lakes. Ninespine Stickleback were not captured in spring 2024 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-111

HYDROLOGY CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Low

Site	Channel Width (m)		Water Depth (m)				Water Velocity (m/s)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
20D	3.50	2.30	0.13	0.15	0.04	0.18	0.13	0.58	0.24	0.58
0 (Centreline)	UNDER TOTE ROAD									
20U	13.10	6.40	0.06	0.03	0.12	0.15	0.24	0.29	0.49	0.55

OTHER NOTES / OBSERVATIONS

The stream was narrow and shallow, with moderate water velocities. Wetted widths ranged from 2.3 to 6.4 m. Measured water depths were consistently <0.20 m, with a maximum of 0.18 m. Measured velocities ranged from 0.13-0.58 m/s.

TOTE ROAD CV-111

HABITAT CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Low

Site	Stream Morphology Composition (%)							Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Rapids	Flat	Fines	Gravel	Small Cobble	Large Cobble	Boulders
20D	30	10	-	60	-	-	-	-	20	70	10	-
0 (Centreline)	UNDER TOTE ROAD											
20U	20	10	50	20	-	-	-	10	20	40	30	-

OTHER NOTES / OBSERVATIONS

Stream morphology was mostly riffle and run throughout and substrate was primarily cobble.

TOTE ROAD CV-111

12-JUL-24



A



B



C



D



E



F

Photos 1-1. Photos taken 20 m downstream (top) and 20 m upstream (bottom) in spring 2024: (A,D) facing upstream; (B,E) facing downstream; and (C,F) across (right bank looking at left bank).

TOTE ROAD CV-111

12-JUL-24



A



B

Photos 1-2. Photos taken of the culvert in spring 2024: (A) downstream end; and (B) upstream end.

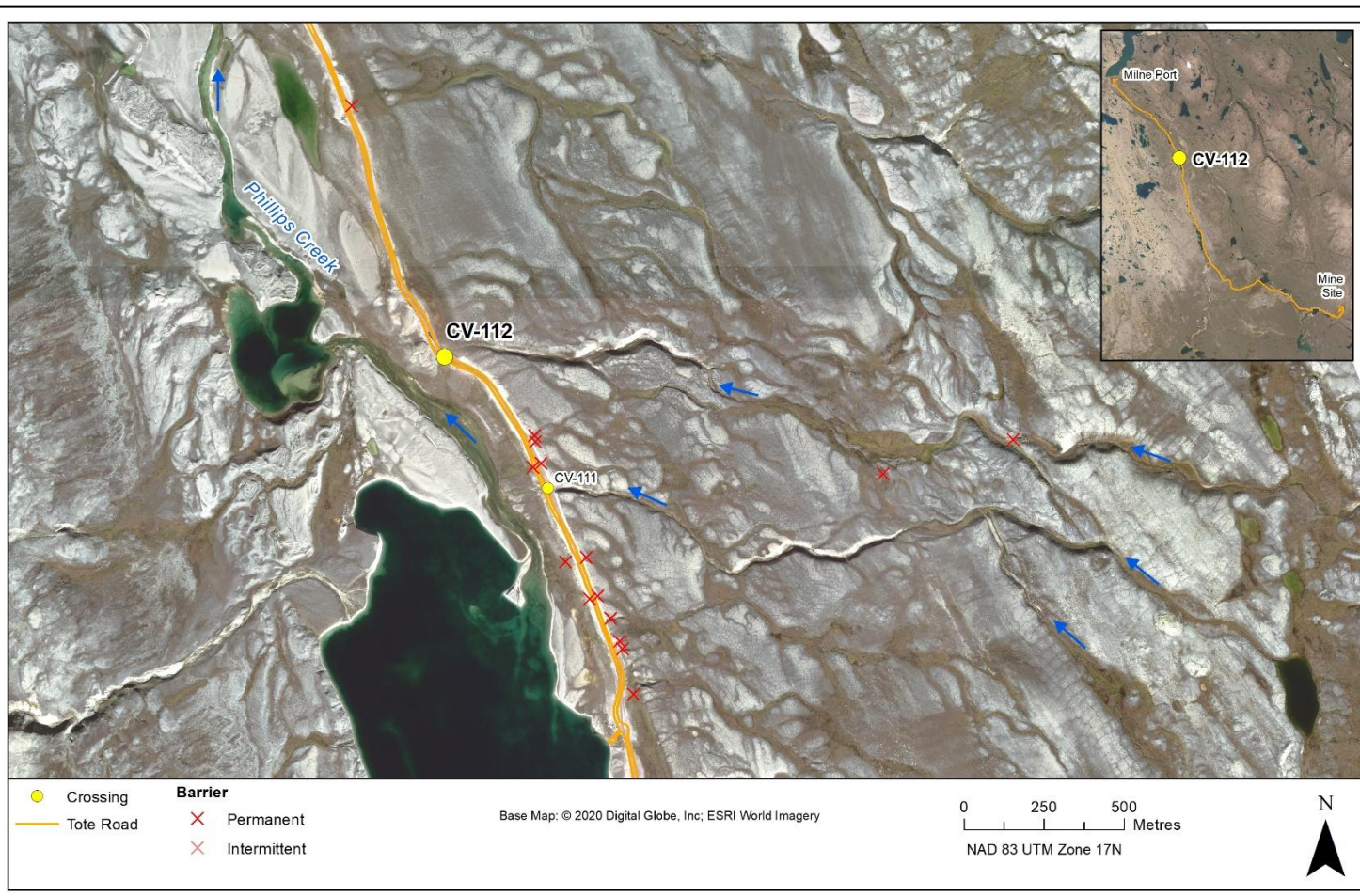
TOTE ROAD CV-112

LOCATION AND CROSSING DESCRIPTION

Site ID:	CV-112	Dates Surveyed:	12-Jul-24	Waterbody Type:	Stream
Project Interaction:	Tote Road Culvert	UTM Coordinates:	17W 521033 E 7954935 N		

GENERAL PHYSICAL CHARACTERISTICS

Flow Regime: Seasonal **Stream Order:** 3



BAFFINLAND IRON MINES
MARY RIVER PROJECT

 **North/South Consultants Inc.**
Aquatic Environment Specialists

FISH HABITAT:

ARCTIC CHAR - YES

NINESPINE STICKLEBACK - POTENTIAL

TOTE ROAD CV-112

SITE SUMMARY

The Tote Road crosses a small, unnamed stream at site CV-112 that flows 120 m west into Phillips Creek, approximately 600 m downstream from Km 32 Lake and 300 m upstream from a smaller, unnamed lake. Km 32 Lake is of sufficient depth to support overwintering of both species. It is unknown if the smaller lake is of sufficient depth to support overwintering. This crossing has been identified for remediation.

Detailed habitat data were collected in the crossing area in late spring 2024. Measured stream wetted widths ranged from 2.2-3.5 m and water depths were shallow, ranging from 0.02-0.13 m. Velocities were low to moderate, ranging from 0.10-0.65 m/s. Stream morphology was predominantly riffle and run throughout. The substrate was primarily gravel/cobble.

Juvenile Arctic Char were captured downstream and upstream of the crossing in spring 2024. Although catch rates were higher downstream (8.02 fish/minute) than upstream (1.25 fish/minute), smaller char were captured in both reaches suggesting no size-restricted access to upstream habitat. Natural stream gradient increases upstream of the road, which may affect fish use. Juvenile Arctic Char are known to use habitat in the vicinity of the Tote Road crossing at CV-112 for rearing/feeding throughout the open-water period. There is no char spawning or overwintering habitat in this stream.

Ninespine Stickleback were not captured in spring 2024 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-112

FISH HABITAT POTENTIAL

Species	Spawning	Overwintering	Rearing	Adults Present
ARCH	N	N	Y	N
NNST	P	N	P	P

FISHERIES DATA

Location	Species	Survey Date	Temperature (°C)	Distance Fished (m)	Effort (Seconds)	# Fish Captured	# Fish Observed	CPUE (No. Fish/60 Seconds)	Length Range (mm)
Downstream	ARCH	12-Jul-24	10.5	50	202	27	0	8.020	42-106
	NNST					0	0	0.00	-
Upstream	ARCH			50	240	5	0	1.250	46-62
	NNST					0	0	0.00	-

OTHER NOTES / OBSERVATIONS

Juvenile Arctic Char were captured downstream and upstream of the crossing in spring 2024. Although catch rates were higher downstream (8.02 fish/minute) than upstream (1.25 fish/minute), smaller char were captured in both reaches suggesting no size-restricted access to upstream habitat. Natural stream gradient increases upstream of the road, which may affect fish use. Ninespine Stickleback were not captured in spring 2024 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-112

HYDROLOGY CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Low

Site	Channel Width (m)		Water Depth (m)				Water Velocity (m/s)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
20D	14.50	3.50	0.02	0.04	0.05	0.13	0.10	0.24	0.15	0.39
0 (Centreline)	UNDER TOTE ROAD									
20U	8.70	2.20	0.11	-	0.12	0.13	0.12	-	0.21	0.65

OTHER NOTES / OBSERVATIONS

Measured stream wetted widths ranged from 2.2-3.5 m and water depths were shallow, ranging from 0.02-0.13 m. Velocities were low to moderate, ranging from 0.10-0.65 m/s.

TOTE ROAD CV-112

HABITAT CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Low

Site	Stream Morphology Composition (%)							Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Rapids	Flat	Fines	Gravel	Small Cobble	Large Cobble	Boulders
20D	40	20	-	40		-	-	10	20	50	20	-
0 (Centreline)	UNDER TOTE ROAD											
20U	30	10	-	50	10	-	-	10	10	40	40	-

OTHER NOTES / OBSERVATIONS

Stream morphology was predominantly riffle and run throughout. The substrate was primarily gravel/cobble.

TOTE ROAD CV-112

12-JUL-24



A



B



C



D



E



F

Photos 1-1. Photos taken 20 m downstream (top) and 20 m upstream (bottom) in spring 2024: (A,D) facing upstream; (B,E) facing downstream; and (C,F) across (left bank looking at right bank).

TOTE ROAD CV-112

12-JUL-24



A



B



C

Photos 1-2. Photos taken of the culvert in spring 2024: (A) downstream end; and (B,C) upstream end.

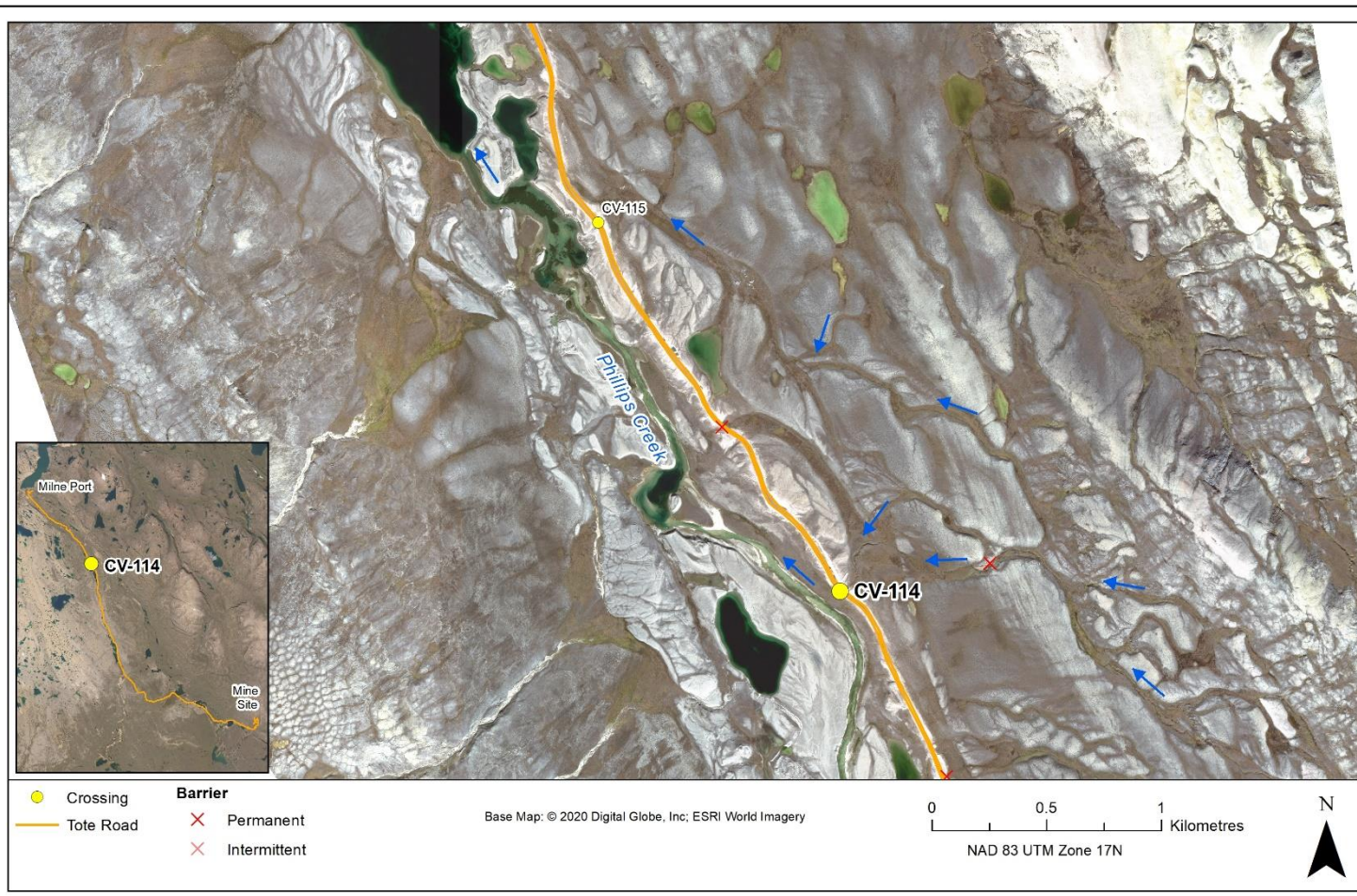
TOTE ROAD CV-114

LOCATION AND CROSSING DESCRIPTION

Site ID:	CV-114	Dates Surveyed:	12-Jul-24	Waterbody Type:	Stream
Project Interaction:	Tote Road Culvert	UTM Coordinates:	17W 520278 E 7956528 N		

GENERAL PHYSICAL CHARACTERISTICS

Flow Regime: Seasonal **Stream Order:** 2



BAFFINLAND IRON MINES
MARY RIVER PROJECT

 **North/South Consultants Inc.**
Aquatic Environment Specialists

FISH HABITAT:

ARCTIC CHAR - YES

NINESPINE STICKLEBACK - POTENTIAL

TOTE ROAD CV-114

SITE SUMMARY

The Tote Road crosses a small, unnamed stream at site CV-114 that flows 70 m west into Phillips Creek, approximately halfway (2.8 km in each direction) between two of the larger lakes (Km 32 and Km 26 lakes) in the Phillips Creek system. Both lakes are of sufficient depth to support overwintering. This crossing has been identified for remediation.

Detailed habitat data were collected in the crossing area in late spring 2024. Measured stream wetted widths ranged from 7.6-16.1 m. Measured depths were low and typically <0.10 m. Velocities were low to moderate, ranging from 0.10-0.65 m/s. Stream morphology was predominantly riffle with some run and pool habitat. The substrate was primarily gravel/cobble downstream and cobble upstream of the crossing.

Fifteen juvenile Arctic Char were captured downstream and none were captured upstream of the crossing in spring 2024. The culverts were perched and likely prevented most, if not all, upstream access for fish. Char use habitat in the vicinity of the Tote Road crossing at CV-114 for rearing/feeding throughout the open-water period. There is no char spawning or overwintering habitat in this stream.

Ninespine Stickleback were not captured in spring 2024 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-114

FISH HABITAT POTENTIAL

Species	Spawning	Overwintering	Rearing	Adults Present
ARCH	N	N	Y	N
NNST	P	N	P	P

FISHERIES DATA

Location	Species	Survey Date	Temperature (°C)	Distance Fished (m)	Effort (Seconds)	# Fish Captured	# Fish Observed	CPUE (No. Fish/60 Seconds)	Length Range (mm)
Downstream	ARCH	12-Jul-24	6.0	50	457	15	0	1.969	55-110
	NNST					0	0	0.00	-
Upstream	ARCH			50	380	0	0	0.00	-
	NNST					0	0	0.00	-

OTHER NOTES / OBSERVATIONS

Fifteen juvenile Arctic Char were captured downstream and none were captured upstream of the crossing in spring 2024. The culverts were perched and likely prevented most, if not all, upstream access for fish. Ninespine Stickleback were not captured in spring 2024 and have not been captured or observed in this stream during previous site surveys. It is unknown if the species is present in the watershed.

TOTE ROAD CV-114

HYDROLOGY CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Low

Site	Channel Width (m)		Water Depth (m)				Water Velocity (m/s)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
20D	34.50	16.10	0.05	0.08	0.02	0.14	0.63	0.39	0.09	0.63
0 (Centreline)	UNDER TOTE ROAD									
20U	10.60	7.60	0.02	0.04	0.05	0.21	0.10	0.31	0.23	0.65

OTHER NOTES / OBSERVATIONS

Measured stream wetted widths ranged from 7.6-16.1 m. Measured depths were low, typically <0.10 m. Velocities were low to moderate, ranging from 0.10-0.65 m/s.

TOTE ROAD CV-114

HABITAT CHARACTERISTICS: 12-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Low

Site	Stream Morphology Composition (%)							Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Rapids	Flat	Fines	Gravel	Small Cobble	Large Cobble	Boulders
20D	60	20	-	20	-	-	-	-	60	30	10	-
0 (Centreline)	UNDER TOTE ROAD											
20U	50	10	-	20	20	-	-	-	10	40	40	10

OTHER NOTES / OBSERVATIONS

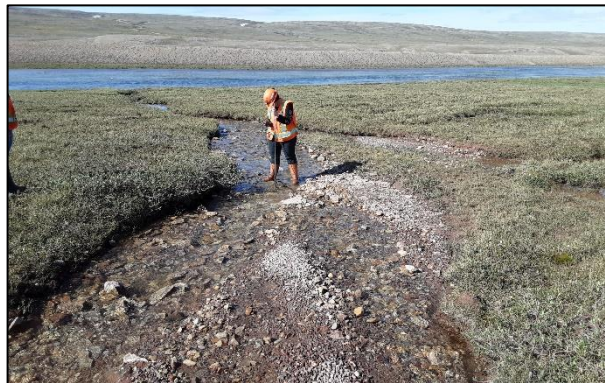
Stream morphology was predominantly riffle with some run and pool habitat. The substrate was primarily gravel/cobble downstream and cobble upstream of the crossing.

TOTE ROAD CV-114

12-JUL-24



A



B



C



D



E



F

Photos 1-1. Photos taken 20 m downstream (top) and 20 m upstream (bottom) in spring 2024: (A,D) facing upstream; (B,E) facing downstream; and (C,F) across (left bank looking at right bank).

TOTE ROAD CV-114

12-JUL-24



A



B

Photos 1-2. Photos taken of the culverts in spring 2024: (A) downstream end; and (B) upstream end.

TOTE ROAD CV-216

LOCATION AND CROSSING DESCRIPTION

Site ID:	CV-216	Dates Surveyed:	15-Jul-24	Waterbody Type:	Stream
Project Interaction:	Tote Road Culvert	UTM Coordinates:	17W 542764 E 7921724 N		

GENERAL PHYSICAL CHARACTERISTICS

Flow Regime: Seasonal **Stream Order:** 2



BAFFINLAND IRON MINES
MARY RIVER PROJECT

 **North/South Consultants Inc.**
Aquatic Environment Specialists

FISH HABITAT:

ARCTIC CHAR - YES

NINESPINE STICKLEBACK - YES

TOTE ROAD CV-216

SITE SUMMARY

The Tote Road crosses a small, unnamed stream at site CV-216 that flows 100 m northwest into Muriel Lake. Although a bathymetric survey has not been conducted, Muriel Lake is believed to be of sufficient depth to support overwintering of both species.

This crossing was remediated in winter 2023/2024. There are now three large, embedded fish passage culverts that eliminated the perching issues observed in previous years. No issues with the crossing were identified at the time of the survey. However, sand had accumulated among the rocks of the apron and inside the culverts during freshet. This stream transports substantial amounts of fine sediment from upstream each spring and continued accumulation at the crossing may eventually create a barrier to fish movements.

Detailed habitat data were collected in the crossing area in late spring 2024. This stream is generally wide, deep, and relatively slow-moving downstream from the crossing in spring. Observations from summer and fall surveys in previous years indicate the stream becomes significantly smaller and shallower shortly after freshet. Downstream of the crossing, the stream is affected by backwatering from Muriel Lake in spring. Upstream of the crossing, the stream is typically very shallow and braided. Wetted widths in spring 2024 ranged from 21.5-39.6 m downstream and 4.7-16.6 m upstream of the crossing. Maximum depths downstream exceeded 1.0 m while upstream depths were typically <0.10 m. Velocities were generally low, ranging from 0.01-0.38 m/s. In wider areas, morphology was mainly shallow and deep pool, with flats dominant in narrower areas. The stream is nearly uniformly composed of fine substrates except for increased proportions of cobble and boulder within the apron footprint.

No fish were captured downstream in spring 2024, but the deep water with fine, soft sediment limited electrofishing efforts to nearshore areas. Six small (45-60 mm) juvenile Arctic Char were captured upstream indicating successful fish passage through the culverts. Previous surveys have shown that young-of-the-year move into the stream from Muriel Lake during late summer. Char use habitat in the stream for rearing throughout the open-water period, but there is no char spawning and no overwintering for either species.

One Ninespine Stickleback was observed upstream but escaped before capture. Stickleback are frequently observed in this stream, particularly upstream of the culvert. Habitat in the stream is suitable for feeding and likely supports spawning for stickleback.

TOTE ROAD CV-216

FISH HABITAT POTENTIAL

Species	Spawning	Overwintering	Rearing	Adults Present
ARCH	N	N	Y	N
NNST	P	N	Y	Y

FISHERIES DATA

Location	Species	Survey Date	Temperature (°C)	Distance Fished (m)	Effort (Seconds)	# Fish Captured	# Fish Observed	CPUE (No. Fish/60 Seconds)	Length Range (mm)
Downstream	ARCH	15-Jul-24	12	50	191	0	0	0.00	-
	NNST					0	0	0.00	-
Upstream	ARCH			50	220	6	0	1.636	45-60
	NNST					0	1	0.273	-

OTHER NOTES / OBSERVATIONS

No fish were captured downstream in spring 2024, but the deep water with fine, soft sediment limited electrofishing efforts to nearshore areas. Six small (45-60 mm) juvenile Arctic Char were captured upstream. One Ninespine Stickleback was observed upstream but escaped before capture.

TOTE ROAD CV-216

HYDROLOGY CHARACTERISTICS: 15-JUL-23

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Moderate

Site	Channel Width (m)		Water Depth (m)				Water Velocity (m/s)			
	Bankfull	Wetted	25%	50%	75%	Max	25%	50%	75%	Max
100D	MURIEL LAKE									
60D	60.10	39.60	too deep			>1.0	too deep			~0.25
20D	41.50	21.50	too deep			>1.0	too deep			~0.25
0 (Centreline)	UNDER TOTE ROAD									
20U	36.20	9.10	0.02	0.01	0.02	0.05	0.19	0.08	0.24	0.38
60U	34.50	4.70	0.02	0.04	0.01	0.06	0.15	0.13	0.01	0.15
100U	29.00	16.60	0.04	0.05	0.02	0.12	0.10	0.25	0.07	0.25

OTHER NOTES / OBSERVATIONS

Wetted widths in spring 2024 ranged from 21.5-39.6 m downstream and 4.7-16.6 m upstream of the crossing. Maximum depths downstream exceeded 1.0 m while upstream depths were typically <0.10 m. Velocities were generally low, ranging from 0.01-0.38 m/s.

TOTE ROAD CV-216

HABITAT CHARACTERISTICS: 15-JUL-24

Wetted/Dry/Shallow (<0.02 m)/Unconnected Pools: Wetted

Stage: Moderate

Site	Stream Morphology Composition (%)							Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Rapids	Flat	Fines	Gravel	Small Cobble	Large Cobble	Boulders
100D	MURIEL LAKE											
60D	-	20	80	-	-	-	-	95	-	5	-	-
20D	-	15	80	5	-	-	-	70	10	-	10	10
0 (Centreline)	UNDER TOTE ROAD											
20U	10	10	-	-	-	-	80	85	10	5	-	-
60U	-	10	-	-	-	-	90	95	5	-	-	-
100U	-	20	-	-	-	-	80	90	10	-	-	-

OTHER NOTES / OBSERVATIONS

In wider areas, morphology was mainly shallow and deep pool; flats were dominant in narrower areas. The stream is nearly uniformly composed of fine substrates except for increased proportions of cobble and boulder within the apron footprint.

TOTE ROAD CV-216

15-JUL-24



A



B



C



D



E



F

Photos 1-1. Photos taken 20 m downstream (top) and 60 m downstream (bottom) in spring 2024: (A,D) facing upstream; (B,E) facing downstream; and (C,F) across (right bank looking at left bank).