

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 1

UTM: 17W 563473 / 7911679

Latitude / Longitude: 71°17'56.513" N / 79°13'33.863" W

Date / Time Surveyed: 7-Aug-07 / 19:45



Figure 1: View upstream of crossing 1



Figure 2: View across crossing 1 from left bank



Figure 3: View downstream of crossing 1

Watercourse Characteristics

Tributary Status:	4 th order trib of Mary R.
Channel Pattern:	braided, flooded terrestrial
Crossing Site	
Bankfull Width (m):	6.37
Wetted Width (m):	6.37
Depth Profile (25%, 50%, 75%; m):	0.01, 0.03, 0.01
Max. Depth (m):	0.03
Flow Regime:	ephemeral
Gradient (°):	1.5
Upstream	
Wetted / Bankfull Width (m):	9.15 / 9.15
Max. Depth (m):	0.06
Downstream	
Wetted / Bankfull Width (m):	16.50 / 16.50
Max. Depth (m):	0.01

Notes

The Mary River is ~2 km downstream. There is a small, shallow lake ~500m downstream of the crossing. A dry stretch upstream of the crossing acts as a barrier.

Crossing ID: 1A

UTM: 17W 563583 / 7911598

Latitude / Longitude: 71°17'53.795" N / 79°13'23.042" W

Date / Time Surveyed: 7-Aug-07 / 21:01



Figure 1: View upstream of crossing 1A



Figure 2: View across crossing 1A from left bank



Figure 3: View downstream of crossing 1A

Watercourse Characteristics

Tributary Status:	4 th order trib of Mary R.
Channel Pattern:	braided
Crossing Site	
Bankfull Width (m):	11.15
Wetted Width (m):	no water
Depth Profile (25%, 50%, 75%; m):	N/A
Max. Depth (m):	N/A
Flow Regime:	ephemeral
Gradient (°):	6
Upstream	
Wetted / Bankfull Width (m):	no water / 7.30
Max. Depth (m):	N/A
Downstream	
Wetted / Bankfull Width (m):	N/M
Max. Depth (m):	N/M

Notes

The Mary River is ~2 km downstream. There is a small, shallow lake ~500 m downstream of the crossing site.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 2

UTM: 563768 / 7911403

Latitude / Longitude: 71°17'47.329" N / 79°13'5.019" W

Date / Time Surveyed: 7-Aug-07 / 19:10

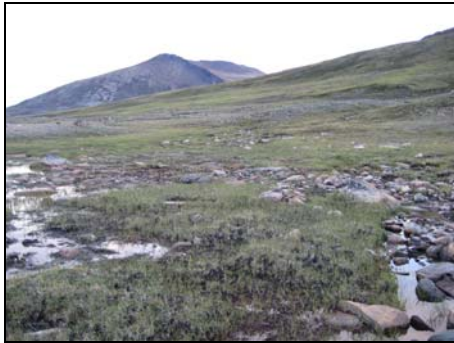


Figure 1: View upstream of crossing 2



Figure 2: View across crossing 2 from right bank



Figure 3: View downstream of crossing 2

Watercourse Characteristics

Tributary Status:	2 nd order trib of Mary R.
Channel Pattern:	braided, flooded terrestrial
Crossing Site	
Bankfull Width (m):	50.00
Wetted Width (m):	20.00
Depth Profile (25%, 50%, 75%; m):	N/M
Max. Depth (m):	<0.05
Flow Regime:	ephemeral
Gradient (°):	2
Upstream	
Wetted / Bankfull Width (m):	20.00 / 50.00
Max. Depth (m):	<0.05
Downstream	
Wetted / Bankfull Width (m):	20.00 / 50.00
Max. Depth (m):	<0.05

Notes

The Mary River is ~2.5 km downstream. There is a small lake ~1 km downstream of the crossing site. A dry stretch between the lake and the crossing acts as a barrier.

Crossing ID: 3

UTM: 563824 / 7911323

Latitude / Longitude: 71°17'44.694" N / 79°12'59.626" W

Date / Time Surveyed: 7-Aug-07 / 20:16



Figure 1: View upstream of crossing 3



Figure 2: View across crossing 3 from right bank



Figure 3: View downstream of crossing 3

Watercourse Characteristics

Tributary Status:	2 nd order trib of Mary R.
Channel Pattern:	braided, flooded terrestrial
Crossing Site	
Bankfull Width (m):	45.00
Wetted Width (m):	22.50
Depth Profile (25%, 50%, 75%; m):	N/M
Max. Depth (m):	0.1
Flow Regime:	intermittent
Gradient (°):	2
Upstream	
Wetted / Bankfull Width (m):	2.50 / 8.00
Max. Depth (m):	0.20
Downstream	
Wetted / Bankfull Width (m):	20.00 – 25.00 / ~45.00
Max. Depth (m):	~0.10

Notes

The Mary River is ~2.5 km downstream. There is a small lake ~1 km downstream of the crossing site.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 4

UTM: 17W 563996 / 7911084

Latitude / Longitude: 71°17'36.820" N / 79°12'43.044" W

Date / Time Surveyed: 7-Aug-07 / 21:53



Figure 1: View upstream of crossing 4



Figure 2: View across crossing 4 from right bank



Figure 3: View downstream of crossing 4

Watercourse Characteristics

Tributary Status: 3rd order trib of Mary R.

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): 10.15
Wetted Width (m): 10.15
Depth Profile (25%, 50%, 75%; m): 0.01, 0.04, 0.07
Max. Depth (m): 0.07
Flow Regime: ephemeral
Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): 0.34 / 0.34
Max. Depth (m): 0.10

Downstream

Wetted / Bankfull Width (m): 15.92 / 23.18
Max. Depth (m): 0.15

Notes

The Mary River is ~3 km downstream. There is a small lake ~1.5 km downstream of the crossing site. Low water acts as a barrier between the lake and the crossing.

Crossing ID: 5

UTM: 17W 564103 / 7910941

Latitude / Longitude: 71°17'32.104" N / 79°12'32.714" W

Date / Time Surveyed: 7-Aug-07 / 23:25



Figure 1: View upstream of crossing 5



Figure 2: View across crossing 5 from right bank



Figure 3: View downstream of crossing 5

Watercourse Characteristics

Tributary Status: 2nd order trib of Mary R.

Channel Pattern: sinuous, braided

Crossing Site

Bankfull Width (m): 9.70
Wetted Width (m): 9.70
Depth Profile (25%, 50%, 75%; m): 0.01, 0.11, 0.13
Max. Depth (m): 0.24
Flow Regime: persistent
Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): 0.72 / 0.72
Max. Depth (m): 0.10

Downstream

Wetted / Bankfull Width (m): 15.92 / 23.18
Max. Depth (m): 0.15

Notes

The Mary River is ~3 km downstream. There is a lake ~1.5 km downstream of the crossing site (same as Site 4). Low water acts as a barrier between the lake and the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 6

UTM: 17W 564627 / 7910549

Latitude / Longitude: 71°17'18.955" N / 79°11'41.221" W

Date / Time Surveyed: 7-Aug-07 / 22:38



Figure 1: View upstream of crossing 6



Figure 2: View across crossing 6 from left bank



Figure 3: View downstream of crossing 6

Watercourse Characteristics

Tributary Status: 2nd order trib of Mary R.

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 8.50

Wetted Width (m): 1.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.50

Flow Regime: intermittent

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): no water / 20.00

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): 0.35 / 1.00

Max. Depth (m): 0.05

Notes

The Mary River is ~4 km downstream. There is a small lake ~3.5 km downstream of the crossing site. Low water levels over a cascade act as a barrier between the lake and the crossing.

Crossing ID: 6A

UTM: 17W 564734 / 7910509

Latitude / Longitude: 71°17'17.562" N / 79°11'30.588" W

Date / Time Surveyed: 7-Aug-07 / 22:26



Figure 1: View upstream of crossing 6A



Figure 2: View across crossing 6A from left bank



Figure 3: View downstream of crossing 6A

Watercourse Characteristics

Tributary Status: 3rd order trib of Mary R.

Channel Pattern: straight

Crossing Site

Bankfull Width (m): 19.00

Wetted Width (m): 3.00

Depth Profile (25%, 50%, 75%; m): 0.05, 0.15, 0.08

Max. Depth (m): 0.20

Flow Regime: persistent

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): 0.80 / N/M

Max. Depth (m): 0.55

Downstream

Wetted / Bankfull Width (m): 6.00 / 17.00

Max. Depth (m): 0.20

Notes

The Mary River is ~4 km downstream. There is a small lake ~3.5 km downstream of the crossing site. A cascade acts as a partial barrier between the lake and the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 7

UTM: 17W 565501 / 7910060

Latitude / Longitude: 71°17'2.332" N / 79°10'14.876" W

Date / Time Surveyed: 7-Aug-07 / 23:10



Figure 1: View downstream of crossing 7, looking upstream



Figure 2: View downstream of crossing 7, across from right bank

Watercourse Characteristics

Tributary Status:	2 nd order trib of Mary R.
Channel Pattern:	slightly meandering
Crossing Site	
Bankfull Width (m):	25.00
Wetted Width (m):	0.80
Depth Profile (25%, 50%, 75%; m):	N/M
Max. Depth (m):	0.25
Flow Regime:	intermittent – persistent
Gradient (°):	10
Upstream	
Wetted / Bankfull Width (m):	N/M
Max. Depth (m):	N/M
Downstream	
Wetted / Bankfull Width (m):	0.75 / 21.00
Max. Depth (m):	0.10

Notes

The Mary River is ~5 km downstream. There is a large lake ~100 m downstream of the crossing site.

Crossing ID: 8

UTM: 17W 565757 / 7909827

Latitude / Longitude: 71°16'54.565" N / 79°9'49.866" W

Date / Time Surveyed: 8-Aug-07 / 00:28



Figure 1: View upstream of crossing 8



Figure 2: View across crossing 8 from left bank



Figure 3: View downstream of crossing 8

Watercourse Characteristics

Tributary Status:	2 nd order trib of Mary R.
Channel Pattern:	nearly straight
Crossing Site	
Bankfull Width (m):	3.00
Wetted Width (m):	1.80
Depth Profile (25%, 50%, 75%; m):	N/M
Max. Depth (m):	0.24
Flow Regime:	intermittent – persistent
Gradient (°):	8
Upstream	
Wetted / Bankfull Width (m):	1.80 / 2.80
Max. Depth (m):	0.05
Downstream	
Wetted / Bankfull Width (m):	1.30 / 3.30
Max. Depth (m):	0.25

Notes

The Mary River is ~5.5 km downstream. There is a large lake ~100 m downstream of the crossing site.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 9

UTM: 17W 565977 / 7909665

Latitude / Longitude: 71°16'49.123" N / 79°9'28.261" W

Date / Time Surveyed: 8-Aug-07 / 00:29



Figure 1: View upstream of crossing 9



Figure 2: View across crossing 9 from left bank



Figure 3: View downstream of crossing 9

Watercourse Characteristics

Tributary Status:	2 nd order trib of Mary R.
Channel Pattern:	braided
Crossing Site	
Bankfull Width (m):	26.70
Wetted Width (m):	11.10
Depth Profile (25%, 50%, 75%; m):	0.07, 0.03, 0.09
Max Depth (m):	0.21
Flow Regime:	persistent
Gradient (°):	8
Upstream	
Wetted / Bankfull Width (m):	17.00 / 18.30
Max. Depth (m):	0.18
Downstream	
Wetted / Bankfull Width (m):	0.78 / 0.78
Max. Depth (m):	0.39

Notes

The Mary River is ~6 km downstream. There is a large lake ~200 m downstream of the crossing site. Falls upstream of the crossing act as a barrier.

Crossing ID: 10

UTM: 17W 566717 / 7909224

Latitude / Longitude: 71°16'34.165" N / 79°8'15.293" W

Date / Time Surveyed: 8-Aug-07 / 01:50



Figure 1: View upstream of crossing 10



Figure 2: View across crossing 10 from left bank



Figure 3: View downstream of crossing 10

Watercourse Characteristics

Tributary Status:	2 nd order trib of Mary R.
Channel Pattern:	sinuous
Crossing Site	
Bankfull Width (m):	1.46
Wetted Width (m):	no water
Depth Profile (25%, 50%, 75%; m):	N/A
Max Depth (m):	N/A
Flow Regime:	intermittent
Gradient (°):	2
Upstream	
Wetted / Bankfull Width (m):	0.07 / 0.57
Max. Depth (m):	0.03
Downstream	
Wetted / Bankfull Width (m):	1.50 / 1.50
Max. Depth (m):	0.03

Notes

The Mary River is ~7.5 km downstream. There is a large lake ~200 m downstream of the crossing site. Low water levels between the lake and the crossing act as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 11

UTM: 17W 567005 / 7908964

Latitude / Longitude: 71°16'25.491" N / 79°7' 47.178" W

Date / Time Surveyed: 8-Aug-07 / 01:03



Figure 1: View upstream of crossing 11



Figure 2: View across crossing 11 from left bank



Figure 3: View downstream of crossing 11

Watercourse Characteristics

Tributary Status: 2nd order trib of Mary R.

Channel Pattern: slightly meandering

Crossing Site

Bankfull Width (m): 13.60
Wetted Width (m): 7.20
Depth Profile (25%, 50%, 75%; m): 0.15, 0.12, 0.16
Max. Depth (m): 0.20
Flow Regime: persistent
Gradient (°): 4

Upstream

Wetted / Bankfull Width (m): 8.00 / 16.00
Max. Depth (m): 0.45

Downstream

Wetted / Bankfull Width (m): 9.00 / 16.00
Max. Depth (m): 0.15

Notes

The Mary River is ~8 km downstream. There is a large lake ~200 m downstream of the crossing site.

Crossing ID: 12

UTM: 17W 567121 / 7908861

Latitude / Longitude: 71°16'22.052" N / 79°7'35.850" W

Date / Time Surveyed: 8-Aug-07 / 01:38



Figure 1: View upstream of crossing 12



Figure 2: View across crossing 12 from right bank



Figure 3: View downstream of crossing 12

Watercourse Characteristics

Tributary Status: 2nd order trib of Mary R.

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 13.70
Wetted Width (m): 1.30
Depth Profile (25%, 50%, 75%; m): N/M
Max. Depth (m): 0.02
Flow Regime: intermittent – persistent
Gradient (°): 15

Upstream

Wetted / Bankfull Width (m): < 1.00
Max. Depth (m): < .05

Downstream

Wetted / Bankfull Width (m): 1.00-1.50 / 10.00-15.00
Max. Depth (m): < 0.20

Notes

The Mary River is ~8 km downstream. There is a large lake ~200 m downstream of the crossing site. Low water levels and a steep gradient act as a barrier between the lake and the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 13

UTM: 17W 567389 / 7908618

Latitude / Longitude: 71°16'13.944" N / 79°7'9.699" W

Date / Time Surveyed: 8-Aug-07 / 02:04



Figure 1: View upstream of crossing 13



Figure 2: View across crossing 13 from right bank



Figure 3: View downstream of crossing 13

Watercourse Characteristics

Tributary Status:	2 nd order trib of large river
Channel Pattern:	braided
Crossing Site	
Bankfull Width (m):	14.00
Wetted Width (m):	no water
Depth Profile (25%, 50%, 75%; m):	N/A
Max. Depth (m):	N/A
Flow Regime:	ephemeral
Gradient (°):	2
Upstream	
Wetted / Bankfull Width (m):	no water
Max. Depth (m):	N/A
Downstream	
Wetted / Bankfull Width (m):	large, unnamed lake
Max. Depth (m):	N/A

Notes

The large, unnamed river (that eventually flows into Angajurjualuk Lake) is ~5 km downstream. There is a large, unnamed lake ~300 m downstream of the crossing site.

Crossing ID: 14

UTM: 17W 567696 / 7908397

Latitude / Longitude: 71°16'6.506" N / 79°6'39.570" W

Date / Time Surveyed: 8-Aug-07 / 02:16



Figure 1: View upstream of crossing 14



Figure 2: View across crossing 14 from left bank



Figure 3: View downstream of crossing 14

Watercourse Characteristics

Tributary Status:	2 nd order trib of large river
Channel Pattern:	braided
Crossing Site	
Bankfull Width (m):	9.00
Wetted Width (m):	no water
Depth Profile (25%, 50%, 75%; m):	N/A
Max. Depth (m):	N/A
Flow Regime:	ephemeral
Gradient (°):	4
Upstream	
Wetted / Bankfull Width (m):	no water
Max. Depth (m):	N/A
Downstream	
Wetted / Bankfull Width (m):	no water
Max. Depth (m):	N/A

Notes

The large, unnamed river is ~5 km downstream. There is a large lake ~300 m downstream of the crossing site. Cascades and no water act as barriers between the lake and the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 15A

UTM: 17W 568006 / 7908236

Latitude / Longitude: 71°16'0.999" N / 79°6'8.958" W

Date / Time Surveyed: 8-Aug-07 / 02:30



Figure 1: View upstream of crossing 15A



Figure 2: View across crossing 15A from right bank



Figure 3: View downstream of crossing 15A

Watercourse Characteristics

Tributary Status:	3 rd order trib of large river
Channel Pattern:	meandering, flooded terrestrial
Crossing Site	
Bankfull Width (m):	2.47
Wetted Width (m):	1.23
Depth Profile (25%, 50%, 75%; m):	0.01, 0.04, 0.02
Max. Depth (m):	0.07
Flow Regime:	ephemeral
Gradient (°):	N/M
Upstream	
Wetted / Bankfull Width (m):	no water
Max. Depth (m):	N/A
Downstream	
Wetted / Bankfull Width (m):	1.00-2.00 / 2.00-3.00
Max. Depth (m):	< 0.10

Notes

The large, unnamed river is ~5 km downstream. There is a large lake ~0.5 km downstream of the crossing. A steep downstream cascade acts as a barrier.

Crossing ID: 15B

UTM: 17W 568072 / 7908202

Latitude / Longitude: 71°15'59.836" N / 79°6'2.440" W

Date / Time Surveyed: 8-Aug-07 / 02:14



Figure 1: View upstream of crossing 15B



Figure 2: View across crossing 15B from left bank



Figure 3: View downstream of crossing 15B

Watercourse Characteristics

Tributary Status:	3 rd order trib of large river
Channel Pattern:	straight, flooded terrestrial
Crossing Site	
Bankfull Width (m):	undefined
Wetted Width (m):	undefined
Depth Profile (25%, 50%, 75%; m):	N/M
Max. Depth (m):	0.01
Flow Regime:	ephemeral
Gradient (°):	1
Upstream	
Wetted / Bankfull Width (m):	9.80 / 9.80
Max. Depth (m):	0.15
Downstream	
Wetted / Bankfull Width (m):	3.48 / 7.81
Max. Depth (m):	under boulders

Notes

The large, unnamed river is ~5 km downstream. There is a large lake ~0.5 km downstream of the crossing. Low water levels downstream of the crossing site act as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 16

UTM: 17W 568247 / 7908113

Latitude / Longitude: 71°15'56.787" N / 79°5'45.155" W

Date / Time Surveyed: 8-Aug-07/ 02:46



Figure 1: View upstream of crossing 16



Figure 2: View across crossing 16 from left bank



Figure 3: View downstream of crossing 16

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: straight

Crossing Site

Bankfull Width (m): 6.30

Wetted Width (m): 0.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.12

Flow Regime: persistent

Gradient (°): 5

Upstream

Wetted / Bankfull Width (m): < 0.50 / < 6.00

Max. Depth (m): < 0.10

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~5 km downstream. There is a large lake ~0.5 km downstream of the crossing site. Barriers near the crossing site include water flowing through a boulder downstream, and low water upstream.

Crossing ID: 16A

UTM: no waypoint available

Latitude / Longitude: N/A

Date / Time Surveyed: 8-Aug-07 / 03:01



Figure 1: View upstream of crossing 16A



Figure 2: View across crossing 16A from left bank



Figure 3: View downstream of crossing 16A

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 13.00

Wetted Width (m): 5.30

Depth Profile (25%, 50%, 75%; m): 0.08, 0.12, 0.17

Max. Depth (m): 0.17

Flow Regime: persistent

Gradient (°): 7

Upstream

Wetted / Bankfull Width (m): 5.30 / 13.00

Max. Depth (m): 0.15

Downstream

Wetted / Bankfull Width (m): 5.30 / 13.00

Max. Depth (m): 0.15

Notes

The large, unnamed river is ~5 km downstream. There is a large lake ~0.6 km downstream of the crossing site. Falls ~200m upstream of the crossing act as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 16B

UTM: no waypoint available

Latitude / Longitude: N/A

Date / Time Surveyed: 8-Aug-07 / 03:17



Figure 1: View upstream of crossing 16B



Figure 2: View across crossing 16B from left bank



Figure 3: View downstream of crossing 16B

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 0.70

Wetted Width (m): 0.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.03

Flow Regime: persistent

Gradient (°): 7

Upstream

Wetted / Bankfull Width (m): ~0.50 / ~0.70

Max. Depth (m): < 0.03

Downstream

Wetted / Bankfull Width (m): ~0.50 / ~0.70

Max. Depth (m): < 0.05

Notes

The large, unnamed river is ~5 km downstream. There is a large lake ~0.6 km downstream of the crossing site. Falls ~200 m upstream of the crossing act as a barrier (same as for Site 16A).

Crossing ID: 17

UTM: 17W 568608 / 7907928

Latitude / Longitude: 71°15'50.452" N / 79°5'9.509" W

Date / Time Surveyed: 8-Aug-07 / 03:20



Figure 1: View upstream of crossing 17



Figure 2: View across crossing 17 from left bank



Figure 3: View downstream of crossing 17

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 0.50

Wetted Width (m): 0.40

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.24

Flow Regime: persistent

Gradient (°): 7

Upstream

Wetted / Bankfull Width (m): ~0.40 / ~0.40

Max. Depth (m): < 0.20

Downstream

Wetted / Bankfull Width (m): ~0.40 / ~0.40

Max. Depth (m): < 0.40

Notes

The large, unnamed river is ~5 km downstream. There is a large lake ~1 km downstream of the crossing site. Falls upstream of the crossing act as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 18

UTM: 17W 568765 / 7907848

Latitude / Longitude: 71°15'47.710" N / 79°4'54.007" W

Date / Time Surveyed: 8-Aug-07 / 03:44



Figure 1: View upstream of crossing 18



Figure 2: View across crossing 18 from left bank



Figure 3: View downstream of crossing 18

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: braided, flooded terrestrial

Crossing Site

Bankfull Width (m): 17.00

Wetted Width (m): 10.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.05

Flow Regime: ephemeral

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): no surface water

Max. Depth (m): N/A

Notes

The large, unnamed river is ~4.5 km downstream. A dry stretch acts as a barrier between the crossing and downstream reaches.

Crossing ID: 19

UTM: 17W 568929 / 7907748

Latitude / Longitude: 71°15'44.316" N / 79°4'37.867" W

Date / Time Surveyed: 9-Aug-07 / 19:24

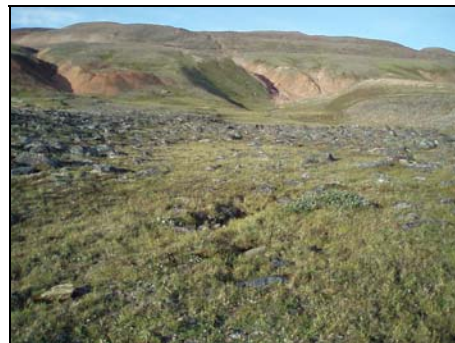


Figure 1: View upstream of crossing 19



Figure 2: View across crossing 19 from left bank



Figure 3: View downstream of crossing 19

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width: undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

The large, unnamed river is ~4.5 km downstream. A dry stretch acts as a barrier between the crossing and downstream reaches.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 20

UTM: 17W 569015 / 7907692

Latitude / Longitude: 71°15'42.422" N / 79°4'29.416" W

Date / Time Surveyed: 8-Aug-07 / 04:37

**Figure 1:** View upstream of crossing 20**Figure 2:** View across crossing 20 from left bank**Figure 3:** View downstream of crossing 20**Watercourse Characteristics**Tributary Status: 3rd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 2.36

Wetted Width (m): 2.06

Depth Profile (25%, 50%, 75%; m): 0.10, 0.07, 0.13

Max. Depth (m): 0.13

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): 1.30 / 1.30

Max. Depth (m): 0.15

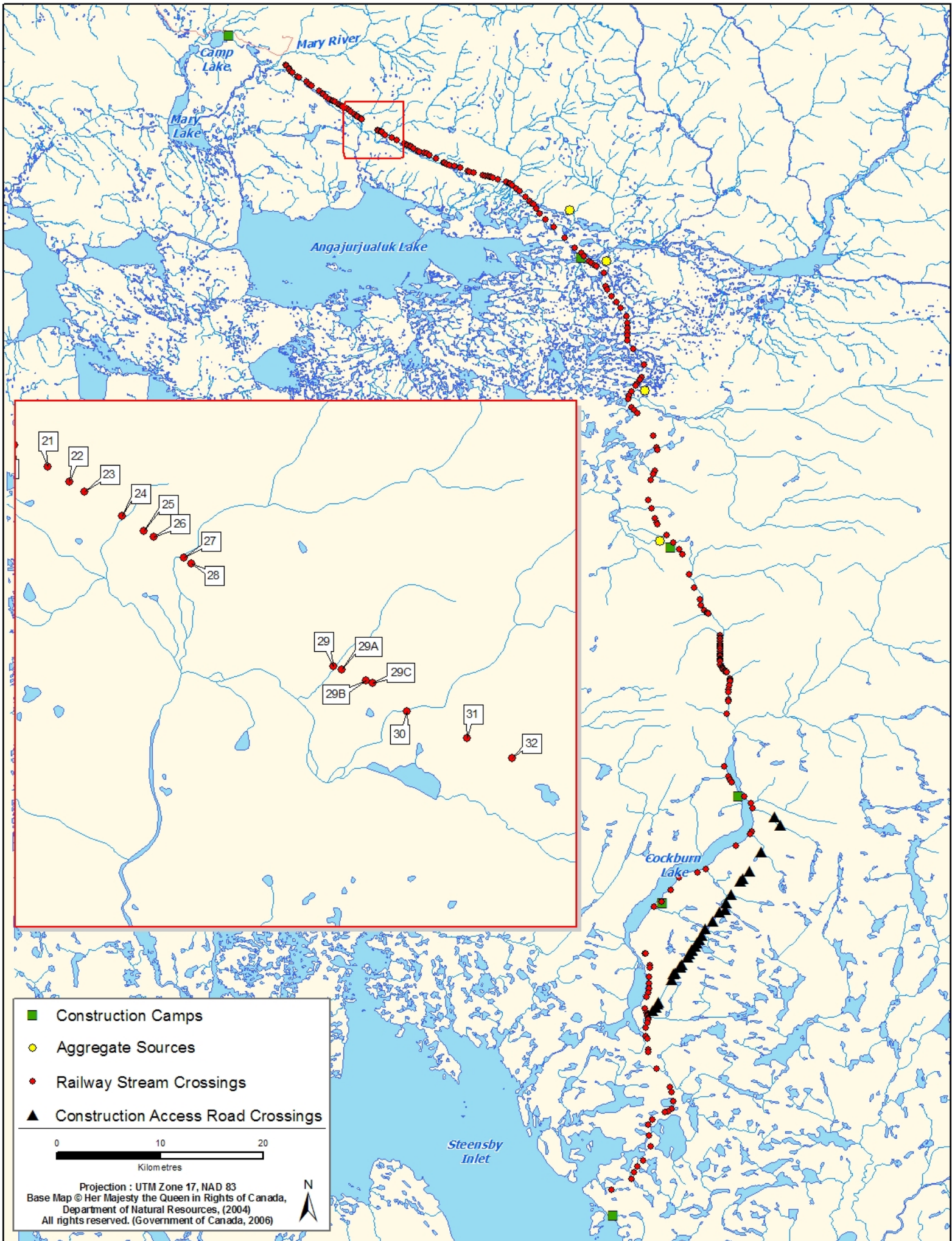
Downstream

Wetted / Bankfull Width (m): > 2.00 / > 2.00

Max. Depth (m): < 0.20

Notes

The large, unnamed river is ~4 km downstream.



Rail Alignment Watercourse Crossing Assessments

Crossing ID: 21**UTM:** 17W 569365 / 7907464**Latitude / Longitude:** 71°15'34.706" N / 79°3'55.026" W**Date / Time Surveyed:** 8-Aug-07 / 05:06

Figure 1: View upstream of crossing 21



Figure 2: View across crossing 21 from left bank



Figure 3: View downstream of crossing 21

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 1.40

Wetted Width (m): 0.90

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.18

Flow Regime: persistent

Gradient (°): 6

Upstream

Wetted / Bankfull Width (m): < 1.00 / < 2.00

Max. Depth (m): < 0.20

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~4 km downstream. Cascades downstream of the crossing act as a partial barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 22

UTM: 17W 569596 / 7907308

Latitude / Longitude: 71°15'29.435" N / 79°3'32.350" W

Date / Time Surveyed: 8-Aug-07 / 05:32

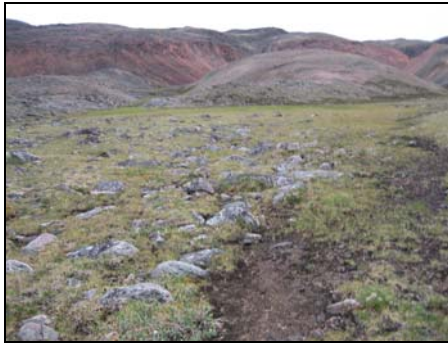


Figure 1: View upstream of crossing 22



Figure 2: View across crossing 22 from left bank



Figure 3: View downstream of crossing 22

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 2.20
Wetted Width (m): no water
Depth Profile (25%, 50%, 75%; m): N/A
Max. Depth (m): N/A
Flow Regime: ephemeral
Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): no water
Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water
Max. Depth (m): N/A

Notes

The large, unnamed river is ~4 km downstream. There is a small lake ~0.5 km downstream of the crossing site. A dry stretch acts as a barrier between the lake and the crossing.

Crossing ID: 22A

UTM: no waypoint available

Latitude / Longitude: N/A

Date / Time Surveyed: 8-Aug-07 / 05:39

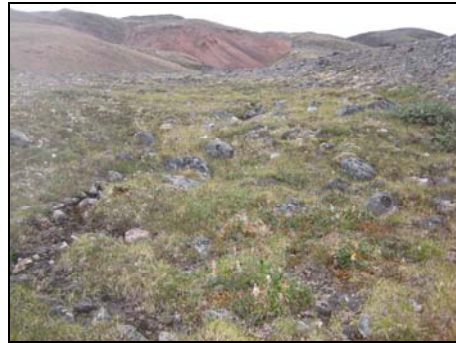


Figure 1: View upstream of crossing 22A

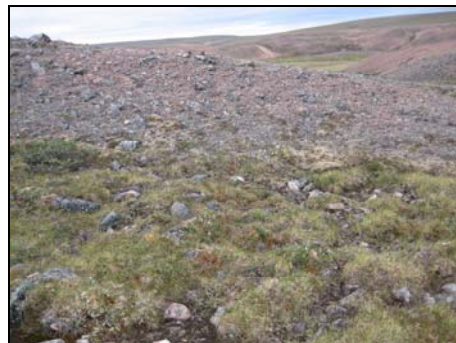


Figure 2: View across crossing 22A from left bank

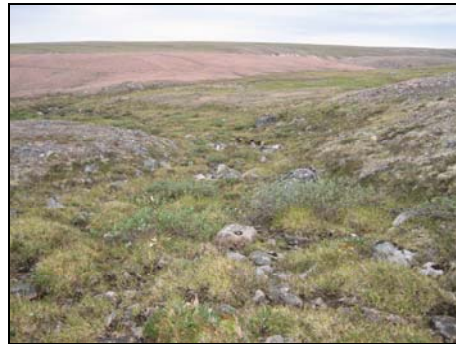


Figure 3: View downstream of crossing 22A

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 0.50
Wetted Width (m): no water
Depth Profile (25%, 50%, 75%; m): N/A
Max. Depth (m): N/A
Flow Regime: ephemeral
Gradient (°): 8

Upstream

Wetted / Bankfull Width (m): no water
Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): isolated pools
Max. Depth (m): 0.15

Notes

The large, unnamed river is ~4 km downstream. There is a small lake ~0.5 km downstream of the crossing site. A dry stretch acts as a barrier between the lake and the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 23

UTM: 17W 569752 / 7907206

Latitude / Longitude: 71°15'25.983" N / 79°3'17.028" W

Date / Time Surveyed: 8-Aug-07 / 05:49



Figure 1: View upstream of crossing 23



Figure 2: View across crossing 23 from left bank



Figure 3: View downstream of crossing 23

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: meandering

Crossing Site

Bankfull Width (m): 5.00

Wetted Width (m): 3.60

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.10

Flow Regime: persistent

Gradient (°): 7

Upstream

Wetted / Bankfull Width (m): 2.00 / 12.00

Max. Depth (m): 0.20

Downstream

Wetted / Bankfull Width (m): 0.50 / 1.00

Max. Depth (m): 0.35

Notes

There is a large, unnamed river ~3 km downstream of the crossing site. A lack of fish suggests that there may be an unidentified barrier between the large river and the crossing.

Crossing ID: 24

UTM: 17W 570144 / 7906949

Latitude / Longitude: 71°15'17.285" N / 79°2'38.534" W

Date / Time Surveyed: 8-Aug-07 / 20:12



Figure 1: View upstream of crossing 24



Figure 2: View across crossing 24 from left bank



Figure 3: View downstream of crossing 24

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: meandering

Crossing Site

Bankfull Width (m): 19.00

Wetted Width (m): 8.00

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.50

Flow Regime: persistent

Gradient (°): 7

Upstream

Wetted / Bankfull Width (m): 5.00 / 7.00

Max. Depth (m): 0.50

Downstream

Wetted / Bankfull Width (m): 5.00 – 10.00 / ~20.0

Max. Depth (m): ~0.50

Notes

There is a large, unnamed river ~3 km downstream of the crossing site. Cascades upstream and downstream of the crossing act as partial barriers.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 25

UTM: 17W 570372 / 7906798

Latitude / Longitude: 71°15'12.175" N / 79°2'16.155" W

Date / Time Surveyed: 8-Aug-07 / 20:31



Figure 1: View upstream of crossing 25



Figure 2: View across crossing 25 from left bank



Figure 3: View downstream of crossing 25

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): very little water

Max. Depth (m): N/A

Notes

The large river ~3 km downstream.

Crossing ID: 26

UTM: 17W 570474 / 7906731

Latitude / Longitude: 71°15'9.909" N / 79°2'6.343" W

Date / Time Surveyed: 9-Aug-07 / 19:58



Figure 1: View upstream of crossing 26



Figure 2: View across crossing 26 from left bank



Figure 3: View downstream of crossing 26

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: sinuous, braided

Crossing Site

Bankfull Width (m): 14.00

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: intermittent

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): 0.80 / 0.80

Max. Depth (m): 0.07

Downstream

Wetted / Bankfull Width (m): no water / 1.00

Max. Depth (m): N/A

Notes

The large river ~2 km downstream.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 27

UTM: 17W 570790 / 7906516

Latitude / Longitude: 71°15'2.640" N / 79°1'35.151" W

Date / Time Surveyed: 8-Aug-07 / 20:28



Figure 1: View upstream of crossing 27



Figure 2: View across crossing 27 from left bank



Figure 3: View downstream of crossing 27

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width: 14.80
Wetted Width (m): 9.80
Depth Profile (25%, 50%, 75%; m): 0.23, 0.30, 0.31
Max. Depth (m): 0.34
Flow Regime: persistent
Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): 14.50 / 18.00
Max. Depth (m): 0.34

Downstream

Wetted / Bankfull Width (m): 15.00 / 18.00
Max. Depth (m): 0.30

Notes

The large, unnamed river is ~1.5 km downstream of the crossing. Cascades upstream of the crossing site act as a partial barrier.

Crossing ID: 28

UTM: 17W 570872 / 7906452

Latitude / Longitude: 71°15'0.489" N / 79°1'27.137" W

Date / Time Surveyed: 8-Aug-07 / 21:48



Figure 1: View upstream of crossing 28



Figure 2: View across crossing 28 from left bank



Figure 3: View downstream of crossing 28

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: slightly meandering

Crossing Site

Bankfull Width (m): undefined
Wetted Width (m): 2.60
Depth Profile (25%, 50%, 75%; m): 0.02, 0.13, 0.08
Max. Depth (m): 0.13
Flow Regime: ephemeral
Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): < 2.00 / undefined
Max. Depth (m): < 0.15

Downstream

Wetted / Bankfull Width (m): 0.50 / 0.50
Max. Depth (m): 0.10

Notes

The large, unnamed river is ~1.5 km downstream of the crossing. Cascades downstream of the crossing site act as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 29

UTM: 17W 572351 / 7905383

Latitude / Longitude: 71°14'24.431" N / 78°59'2.389" W

Date / Time Surveyed: 8-Aug-07 / 21:24



Figure 1: View upstream of crossing 29



Figure 2: View across crossing 29 from left bank



Figure 3: View downstream of crossing 29

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 1.90

Wetted Width (m): 1.80

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.12

Flow Regime: persistent

Gradient (°): 6

Upstream

Wetted / Bankfull Width (m): < 2.00 / < 2.00

Max. Depth (m): < 0.15

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~0.7 km downstream of the crossing. Downstream the stream flows underground, creating a barrier.

Crossing ID: 29 A, B & C

UTM; Latitude / Longitude:

29a = 17W 572442 / 7905350; 71°14'23.268" N / 78°58'53.379" W

29b = 17W 572695 / 7905235; 71°14'19.286" N / 78°58'28.406" W

29c = 17W 572761 / 7905206; 71°14'18.279" N / 78°58'21.889" W

Date / Time Surveyed: 8-Aug-07 / 21:37-21:46



Figure 1: View across crossing 29A from right bank



Figure 2: View across crossing 29B from right bank



Figure 3: View across crossing 29C from right bank

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): N/M

Wetted Width (m): dry or nearly dry

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): dry or nearly so

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): dry or nearly so

Max. Depth (m): N/A

Notes

The large, unnamed river is ~0.8 km downstream of the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 30

UTM: 17W 573122 / 7904914

Latitude / Longitude: 71°14'8.469" N / 78°57'46.694" W

Date / Time Surveyed: 8-Aug-07 / 22:08



Figure 1: View upstream of crossing 30

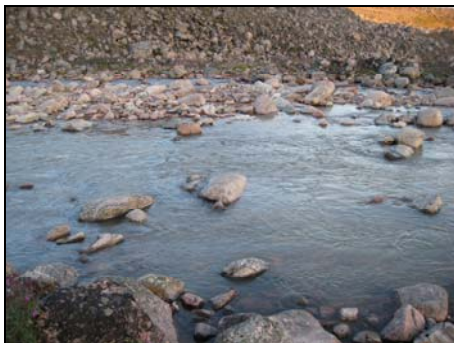


Figure 2: View across crossing 30 from left bank



Figure 3: View downstream of crossing 30

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 59.40

Wetted Width (m): 26.50

Depth Profile (25%, 50%, 75%; m): 0.52, 0.11, 0.25

Max. Depth (m): 0.52

Flow Regime: persistent

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): 12.00 / 17.00

Max. Depth (m): < 0.50

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~1.0 km downstream of the crossing.

Crossing ID: 31

UTM: 17W 573748 / 7904634

Latitude / Longitude: 71°13'58.754" N / 78°56'44.917" W

Date / Time Surveyed: 8-Aug-07 / 22:41



Figure 1: View upstream of crossing 31



Figure 2: View across crossing 31 from left bank



Figure 3: View downstream of crossing 31

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: straight

Crossing Site

Bankfull Width (m): 4.30

Wetted Width (m): 1.50

Depth Profile (25%, 50%, 75%; m): 0.09, 0.18, 0.06

Max. Depth (m): 0.18

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): < 1.50 / < 4.00

Max. Depth (m): < 0.20

Downstream

Wetted / Bankfull Width (m): under rocks / 8.25

Max. Depth (m): N/A

Notes

There is a large lake (part of the large, unnamed river) ~0.7 km downstream of the crossing site. The stream flows underground between the lake and the crossing, creating a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 32

UTM: 17W 574223 / 7904423

Latitude / Longitude: 71°13'51.426" N / 78°55'58.048" W

Date / Time Surveyed: 8-Aug-07 / 23:35

**Figure 1:** View upstream of crossing 32**Figure 2:** View across crossing 32 from left bank**Figure 3:** View downstream of crossing 32**Watercourse Characteristics**Tributary Status: 1st order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 17.90

Wetted Width (m): 3.00

Depth Profile (25%, 50%, 75%; m): 0.03, 0.39, 0.02

Max. Depth (m): 0.39

Flow Regime: persistent

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): 3.00 / 12.96

Max. Depth (m): 0.40

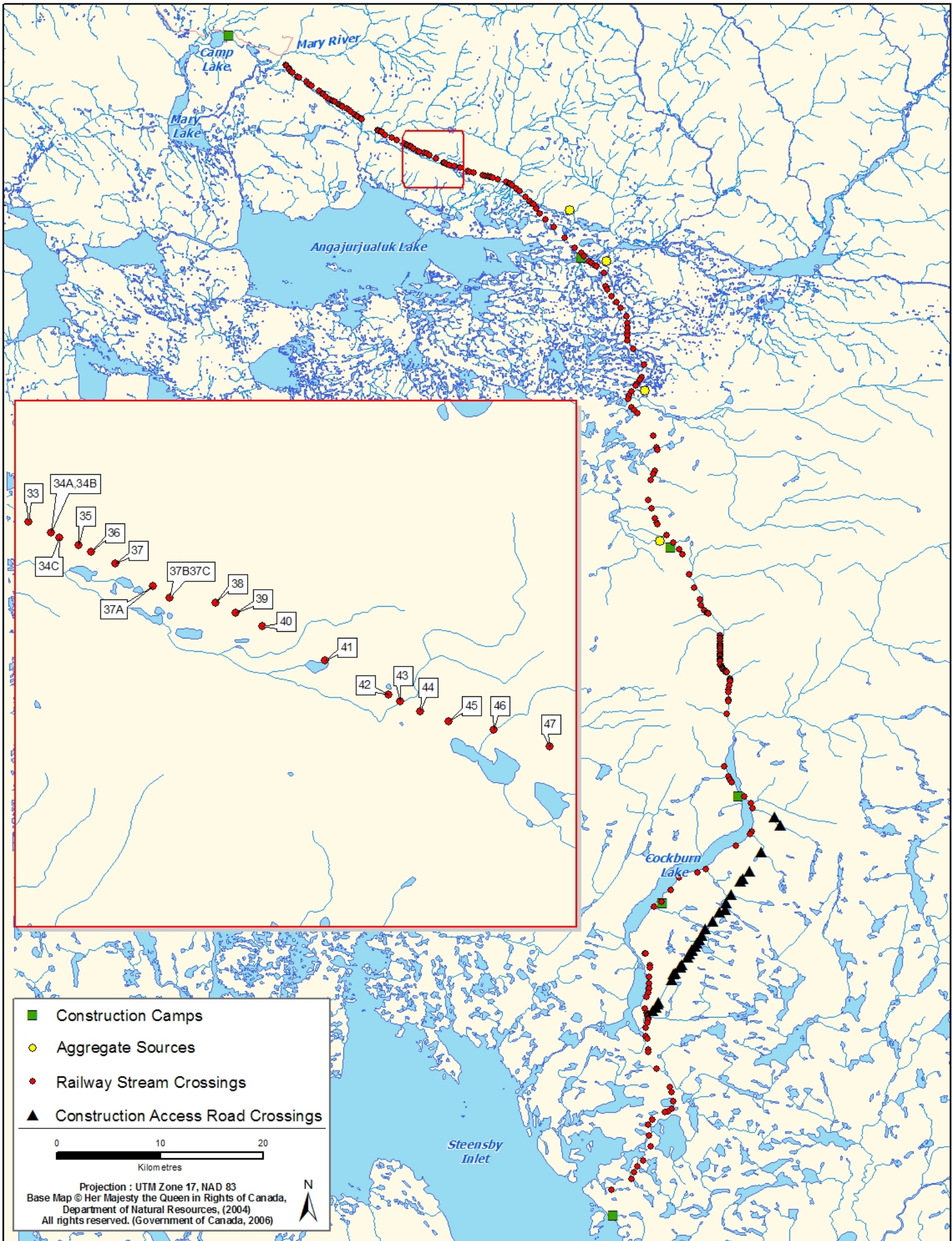
Downstream

Wetted / Bankfull Width (m): 3.00 / 20.30

Max. Depth (m): 0.20

Notes

The large, unnamed river is ~0.8 km downstream of the crossing. Cascades downstream of the crossing site act as a barrier.



Rail Alignment Watercourse Crossing Assessments

Crossing ID: 33**UTM:** 17W 574973 / 7904087**Latitude / Longitude:** 71°13'39.757" N / 78°54'44.074" W**Date / Time Surveyed:** 8-Aug-07 / 23:00

Figure 1: View upstream of crossing 33



Figure 2: View across crossing 33 from left bank



Figure 3: View downstream of crossing 33

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 1.00

Wetted Width (m): 0.70

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.19

Flow Regime: intermittent – persistent

Gradient (°): 8

Upstream

Wetted / Bankfull Width (m): < 0.50 / < 1.00

Max. Depth (m): < 0.15

Downstream

Wetted / Bankfull Width (m): under rocks

Max. Depth (m): N/A

Notes

The large, unnamed river is ~1 km downstream of the crossing. The stream flows underground between the lake and the crossing, creating a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 34A & B

UTM: 17W 575210 / 7903974

Latitude / Longitude: 71°13'35.848" N / 78°54'20.727" W

Date / Time Surveyed: 8-Aug-07 / 23:20



Figure 1: View across crossing 34A from left bank



Figure 2: View across crossing 34B from left bank

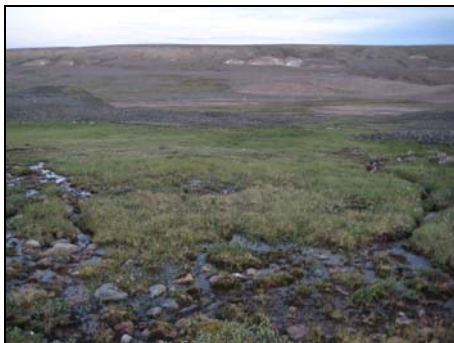


Figure 3: View downstream of crossing 34B

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 1.30

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.10

Flow Regime: ephemeral

Gradient (°): 13

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~0.6 km downstream of the crossing. Barriers near the crossing include a steep drop ~50 m downstream, and no water upstream.

Crossing ID: 34C

UTM: 17W 575295 / 7903923

Latitude / Longitude: 71°13'34.107" N / 78°54'12.391" W

Date / Time Surveyed: 8-Aug-07 / 23:28



Figure 1: View upstream of crossing 34C



Figure 2: View across crossing 34C from left bank



Figure 3: View downstream of crossing 34C

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 5.00

Wetted Width (m): 0.30

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.03

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~0.6 km downstream of the crossing. A steep drop acts as a barrier between the river and the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 35

UTM: 17W 575496 / 7903837

Latitude / Longitude: 71°13'31.108" N / 78°53'52.559" W

Date / Time Surveyed: 8-Aug-07 / 23:39



Figure 1: View upstream of crossing 35



Figure 2: View across crossing 35 from left bank



Figure 3: View downstream of crossing 35

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 1.80

Wetted Width (m): 0.80

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.19

Flow Regime: intermittent

Gradient (°): 4

Upstream

Wetted / Bankfull Width (m): 0.60 / 0.70

Max. Depth (m): 0.15

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~0.5 km downstream of the crossing. There is a small lake ~200 m downstream of the crossing. Cascades between the lake and the crossing act as a barrier.

Crossing ID: 36

UTM: 17W 575630 / 7903773

Latitude / Longitude: 71°13'28.894" N / 78°53'39.362" W

Date / Time Surveyed: 8-Aug-07 / 23:52



Figure 1: View upstream of crossing 36



Figure 2: View across crossing 36 from left bank



Figure 3: View downstream of crossing 36

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 0.50

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral – intermittent

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

The large, unnamed river is ~0.5 km downstream of the crossing. There is a small lake ~200 m downstream of the crossing site.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 37

UTM: 17W 575881 / 7903652

Latitude / Longitude: 71°13'24.709" N / 78°53'14.648" W

Date / Time Surveyed: 9-Aug-07 / 00:06



Figure 1: View upstream of crossing 37

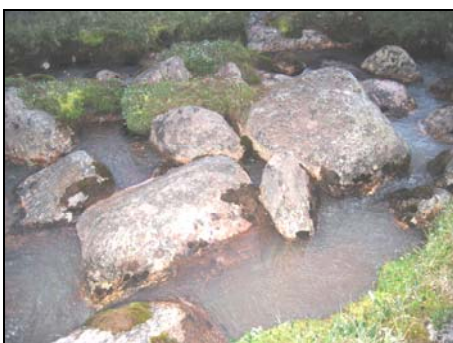


Figure 2: View across crossing 37 from left bank



Figure 3: View downstream of crossing 37

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 4.00

Wetted Width (m): 3.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.30

Flow Regime: persistent

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): < 3.00 / < 4.00

Max. Depth (m): < 0.30

Downstream

Wetted / Bankfull Width (m): 3.00 / 4.00

Max. Depth (m): 0.35

Notes

There is a small lake ~300 m downstream of the crossing site. The large, unnamed river is ~0.6 km downstream of the crossing. A dry stretch between the lake and the crossing acts as a barrier.

Crossing ID: 37A

UTM: 17W 576272 / 7903411

Latitude / Longitude: 71°13'16.493" N / 78°52'36.340" W

Date / Time Surveyed: 9-Aug-07 / 00:27



Figure 1: View upstream of crossing 37A



Figure 2: View across crossing 37A from right bank



Figure 3: View downstream of crossing 37A

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width: N/M

Wetted Width (m): nearly dry

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

There is a small lake ~100 m downstream of the crossing site. The large, unnamed river is ~0.8 km downstream of the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 37B & C

UTM: 17W 576452 / 7903288

Latitude / Longitude: 71°13'12.322" N / 78°52'18.750" W

Date / Time Surveyed: 9-Aug-07 / 00:40



Figure 1: View across crossing 37B from left bank

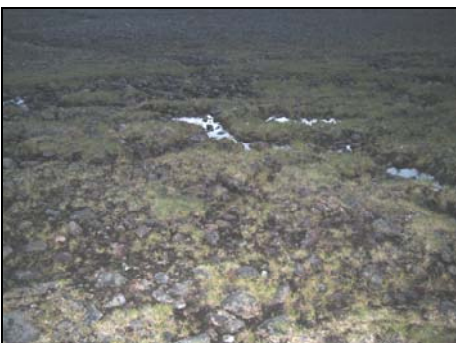


Figure 2: View across crossing 37C from right bank



Figure 3: View downstream of crossing 37B

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): 22.90

Wetted Width (m): 5.00

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.05

Flow Regime: ephemeral

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~0.5 km downstream of the crossing. There is a small lake ~200 m downstream of the crossing site. A dry stretch between the lake and the crossing acts as a barrier.

Crossing ID: 38

UTM: 17W 576932 / 7903240

Latitude / Longitude: 71°13'10.227" N / 78°51'30.862" W

Date / Time Surveyed: 9-Aug 07 / 00:57

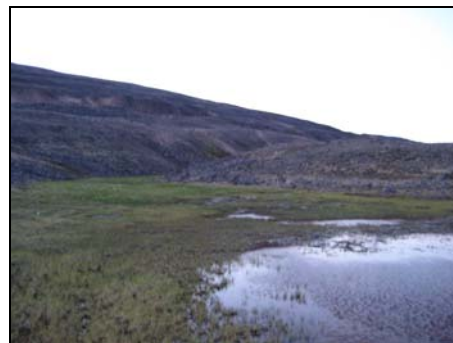


Figure 1: View upstream of crossing 38



Figure 2: View across crossing 38 from left bank

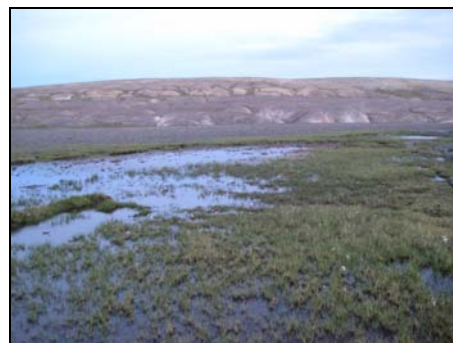


Figure 3: View downstream of crossing 38

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): 54.90

Wetted Width (m): 50.30

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.05

Flow Regime: ephemeral

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~0.8 km downstream of the crossing. There is a small lake ~0.5 km downstream of the crossing site. A dry stretch between the lake and the crossing acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 39

UTM: 17W 577142 / 7903135

Latitude / Longitude: 71°13'6.600" N / 78°51'10.210" W

Date / Time Surveyed: 9-Aug-07 / 01:06



Figure 1: View upstream of crossing 39



Figure 2: View across crossing 39 from left bank



Figure 3: View downstream of crossing 39

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 2.00

Wetted Width (m): 1.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.45

Flow Regime: persistent

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): < 1.50 / < 2.00

Max. Depth (m): < 0.50

Downstream

Wetted / Bankfull Width (m): 1.50-2.50 / 2.00-4.00

Max. Depth (m): 0.50-0.75

Notes

The large, unnamed river is ~0.8 km downstream of the crossing. There is a small lake ~0.5 km downstream of the crossing site. A dry stretch between the lake and the crossing acts as a barrier.

Crossing ID: 40

UTM: 17W 577416 / 7902996

Latitude / Longitude: 71°13'1.803" N / 78°50'43.275" W

Date / Time Surveyed: 9-Aug-07 / 01:29

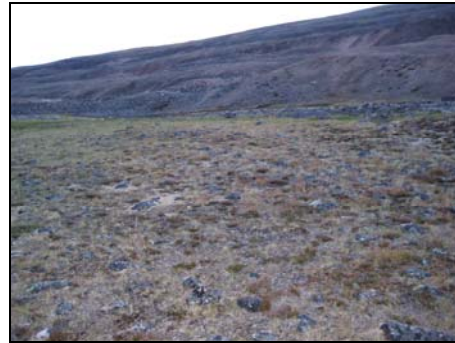


Figure 1: View upstream of crossing 40



Figure 2: View across crossing 40 from left bank



Figure 3: View downstream of crossing 40

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): 27.40

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~0.7 km downstream of the crossing. There is a small lake ~200 m downstream of the crossing site. A dry stretch between the lake and the crossing acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 41

UTM: 17W 578075 / 7902638

Latitude / Longitude: 71°12'49.495" N / 78°49'38.593" W

Date / Time Surveyed: 9-Aug-07 / 01:33



Figure 1: View upstream of crossing 41



Figure 2: View across crossing 41 from right bank



Figure 3: View downstream of crossing 41

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): N/M (MSC)

Wetted Width (m): 7.30

Depth Profile (25%, 50%, 75%; m): 0.13, 0.25, 0.23

Max. Depth (m): 0.25

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): < 0.30

Downstream

Wetted / Bankfull Width (m): small, unnamed lake

Max. Depth (m): N/A

Notes

There is a small lake immediately downstream of the crossing.
The large, unnamed river is ~0.6 km downstream of the crossing.
Cascades upstream of the crossing act as partial barriers.

Crossing ID: 42

UTM: 17W 578733 / 7902277

Latitude / Longitude: 71°12'37.086" N / 78°48'34.045" W

Date / Time Surveyed: 9-Aug-07 / 01:48



Figure 1: View upstream of crossing 42



Figure 2: View across crossing 42 from left bank



Figure 3: View downstream of crossing 42

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 0.70

Wetted Width (m): 0.70

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.10

Flow Regime: intermittent – ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): < 0.50 / < 0.50

Max. Depth (m): < 0.10

Downstream

Wetted / Bankfull Width (m): 0.50-1.00 / 0.50-1.00

Max. Depth (m): 0.10-0.20

Notes

The large, unnamed river is ~0.4 km downstream of the crossing.
A stretch of low water downstream of the crossing acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 43

UTM: 17W 578855 / 7902210

Latitude / Longitude: 71°12'34.782" N / 78°48'22.080" W

Date / Time Surveyed: 9-Aug-07 / 01:55



Figure 1: View upstream of crossing 43



Figure 2: View across crossing 43 from left bank



Figure 3: View downstream of crossing 43

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: slightly meandering

Crossing Site

Bankfull Width (m): 0.95

Wetted Width (m): 0.95

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.28

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): ~1.00 / ~1.00

Max. Depth (m): < 0.40

Downstream

Wetted / Bankfull Width (m): ~1.00 / ~1.00

Max. Depth (m): < 0.50

Notes

The large, unnamed river is ~0.4 km downstream of the crossing.

Crossing ID: 44

UTM: 17W 579065 / 7902100

Latitude / Longitude: 71°12'30.989" N / 78°48'1.467" W

Date / Time Surveyed: 9-Aug-07 / 02:17

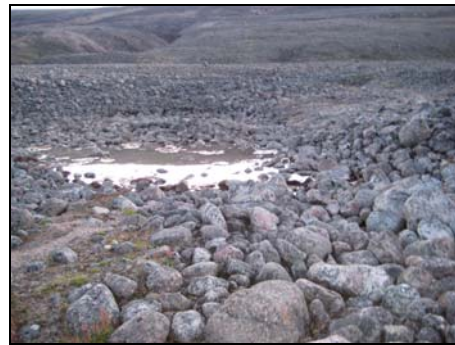


Figure 1: View upstream of crossing 44



Figure 2: View across crossing 44 from right bank

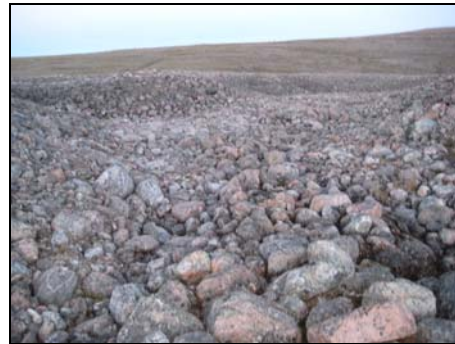


Figure 3: View downstream of crossing 44

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 1.00

Wetted Width (m): 1.00

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): N/M (under boulders)

Flow Regime: intermittent

Gradient (°): 4

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): under rocks

Max. Depth (m): N/A

Notes

The large, unnamed river is ~0.4 km downstream of the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 45

UTM: 17W 579361 / 7901995

Latitude / Longitude: 71°12'27.254" N / 78°47'32.233" W

Date / Time Surveyed: 9-Aug-07 / 02:30



Figure 1: View upstream of crossing 45



Figure 2: View across crossing 45 from right bank

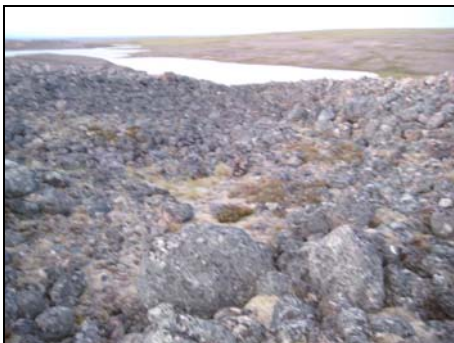


Figure 3: View downstream of crossing 45

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width: undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: intermittent

Gradient (°): 5

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

There is a large lake (part of the large, downstream river) ~300 m downstream of the crossing site.

Crossing ID: 46

UTM: 17W 579831 / 7901915

Latitude / Longitude: 71°12'24.119" N / 78°46'45.502" W

Date / Time Surveyed: 9-Aug-07 / 02:30



Figure 1: View upstream of crossing 46



Figure 2: View across crossing 46 from left bank



Figure 3: View downstream of crossing 46

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: straight

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 1.60

Depth Profile (25%, 50%, 75%; m): 0.16, 0.49, 0.28

Max. Depth (m): 0.49

Flow Regime: persistent

Gradient (°): N/A

Upstream

Wetted / Bankfull Width (m): 3.80 / 4.00

Max. Depth (m): 0.18

Downstream

Wetted / Bankfull Width (m): 3.70 / >5.00

Max. Depth (m): 0.32

Notes

There is a large lake (part of the large, downstream river) ~300 m downstream of the crossing site.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 47

UTM: 17W 580423 / 7901736

Latitude / Longitude: 71°12'17.642" N / 78°45'46.937" W

Date / Time Surveyed: 9-Aug-07 / 03:30



Figure 1: View upstream of crossing 47

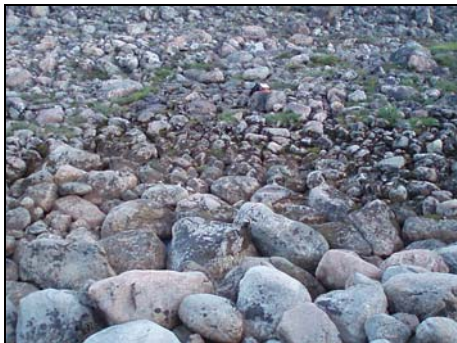


Figure 2: View across crossing 47 from right bank



Figure 3: View downstream of crossing 47

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: straight

Crossing Site

Bankfull Width (m): 23.60

Wetted Width (m): undefined (under rocks)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: intermittent

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): under rocks

Max. Depth (m): N/A

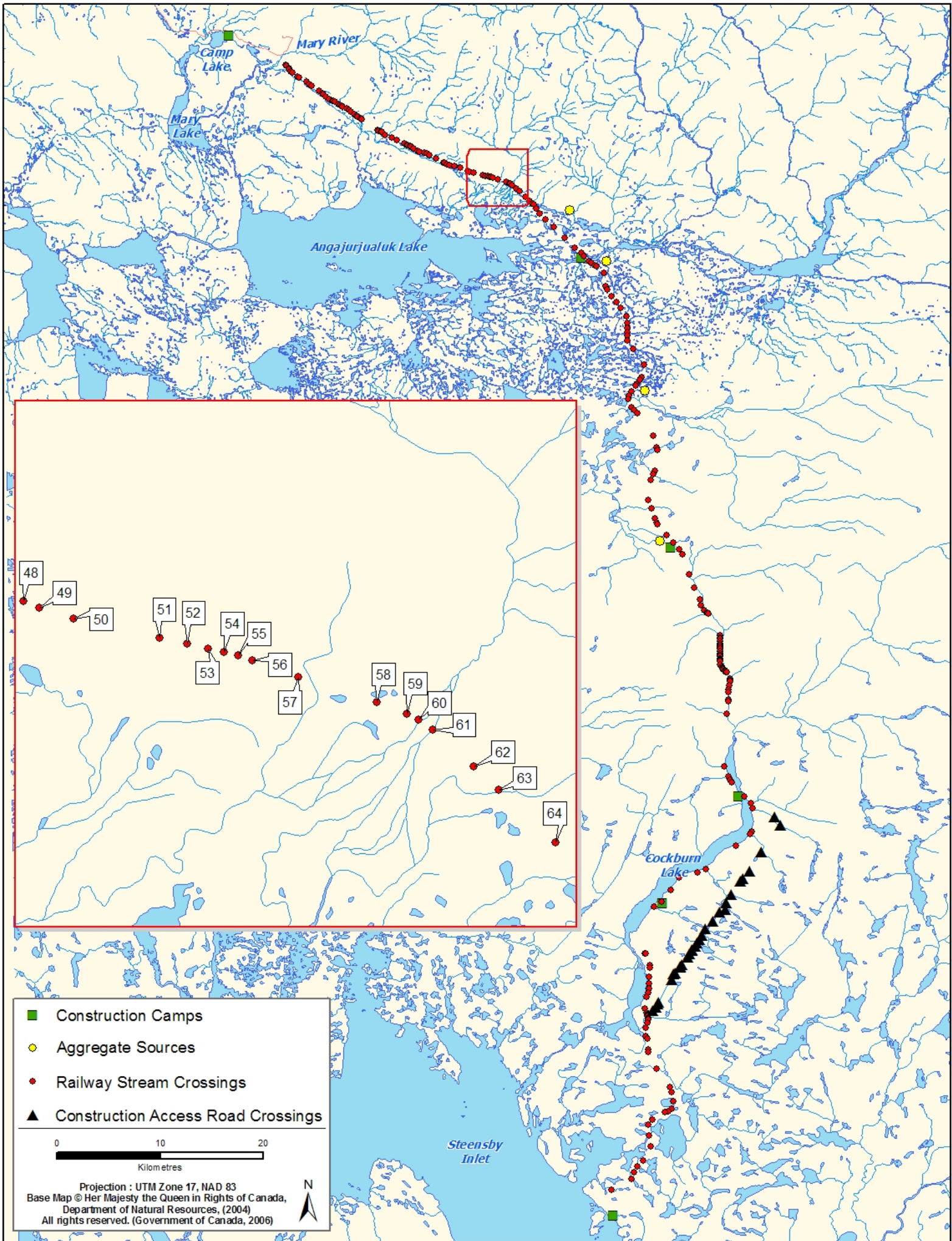
Downstream

Wetted / Bankfull Width (m): under rocks

Max. Depth (m): N/A

Notes

There is a large lake (part of the large, downstream river) ~500 m downstream of the crossing site. The stream flows underground downstream between the lake and the crossing, creating a barrier.



Rail Alignment Watercourse Crossing Assessments

Crossing ID: 48

UTM: 17W 581148 / 7901425

Latitude / Longitude: 71°12'6.743" N / 78°44'35.571" W

Date / Time Surveyed: 9-Aug-07 / 03:05



Figure 1: View upstream of crossing 48



Figure 2: View across crossing 48 from right bank



Figure 3: View downstream of crossing 48

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 3.00

Wetted Width (m): 2.20

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.15

Flow Regime: persistent

Gradient (°): 4

Upstream

Wetted / Bankfull Width (m): under rocks

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): 1.50 / 2.00

Max. Depth (m): 0.15

Notes

There is a small lake ~300 m downstream and a large lake (part of the large, downstream river) ~900 m downstream of the crossing site.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 49

UTM: 17W 581313 / 7901354

Latitude / Longitude: 71°12'4.254" N / 78°44'19.333" W

Date / Time Surveyed: 9-Aug-07 / 03:24



Figure 1: View upstream of crossing 49



Figure 2: View across crossing 49 from right bank



Figure 3: View downstream of crossing 49

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: straight

Crossing Site

Bankfull Width (m): 2.00

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: intermittent

Gradient (°): 5

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

There is a small lake ~300 m downstream and a large lake (part of the large, downstream river) ~900 m downstream of the crossing site.

Crossing ID: 50

UTM: 17W 581664 / 7901241

Latitude / Longitude: 71°12'0.186" N / 78°43'44.652" W

Date / Time Surveyed: 9-Aug-07 / 03:37



Figure 1: View upstream of crossing 50



Figure 2: View across crossing 50 from left bank



Figure 3: View downstream of crossing 50

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width: undefined

Wetted Width (m): water under boulders

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: intermittent

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): under rocks

Max. Depth (m): N/A

Notes

There is a small lake (part of the large, downstream river) 1 km downstream of the crossing site. The stream flows under boulders between the lake and the crossing, creating a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 51

UTM: 17W 582566 / 7901042

Latitude / Longitude: 71°11'52.669" N / 78°42'15.200" W

Date / Time Surveyed: 9-Aug-07 / 04:16



Figure 1: View upstream of crossing 51



Figure 2: View across crossing 51 from right bank



Figure 3: View downstream of crossing 51

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 25.60

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~1.5 km downstream of the crossing.

Crossing ID: 52

UTM: 17W 582851 / 7900979

Latitude / Longitude: 71°11'50.288" N / 78°41'46.940" W

Date / Time Surveyed: 9-Aug-07 / 04:32



Figure 1: View upstream of crossing 52



Figure 2: View across crossing 52 from right bank

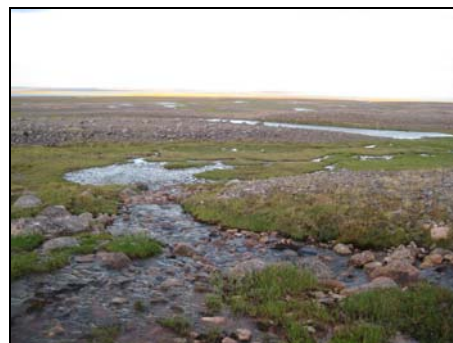


Figure 3: View downstream of crossing 52

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: braided, sinuous

Crossing Site

Bankfull Width (m): 12.00

Wetted Width (m): 14.00

Depth Profile (25%, 50%, 75%; m): N/M

Max Depth (m): 0.11

Flow Regime: intermittent – persistent

Gradient (°): 15

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): 2.20 / 3.00

Max. Depth (m): 0.26

Notes

The large, unnamed river is ~2 km downstream of the crossing. The steep gradient upstream of the crossing is a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 53

UTM: 17W 583070 / 7900930

Latitude / Longitude: 71°11'48.438" N / 78°41'25.229" W

Date / Time Surveyed: 9-Aug-07 / 04:04



Figure 1: View upstream of crossing 53



Figure 2: View across crossing 53 from right bank

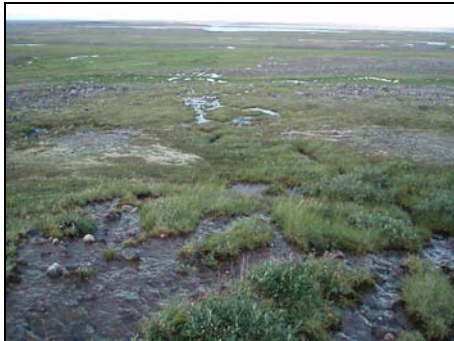


Figure 3: View downstream of crossing 53

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: braided, sinuous

Crossing Site

Bankfull Width (m): N/M (MSC)

Wetted Width (m): 2.00

Depth Profile (25%, 50%, 75%; m): 0.07, 0.02, 0.03

Max. Depth (m): 0.07

Flow Regime: persistent

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): < 2.00 / MSC

Max. Depth (m): < 0.10

Downstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Notes

The large, unnamed river is ~3 km downstream of the crossing. A cascade and low water between the downstream river and the crossing act as barriers.

Crossing ID: 54

UTM: 17W 583242 / 7900892

Latitude / Longitude: 71°11'47.001" N / 78°41'8.176" W

Date / Time Surveyed: 9-Aug-07 / 04:55



Figure 1: View upstream of crossing 54



Figure 2: View across crossing 54 from left bank



Figure 3: View downstream of crossing 54

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: braided, sinuous

Crossing Site

Bankfull Width (m): N/M (MSC)

Wetted Width (m): 2.50

Depth Profile (25%, 50%, 75%; m): 0.11, 0.08, 0.05

Max. Depth (m): 0.11

Flow Regime: persistent

Gradient (°): 10

Upstream

Wetted / Bankfull Width (m): 2.00 / 2.00

Max. Depth (m): 0.10

Downstream

Wetted / Bankfull Width (m): 1.10 / 1.10

Max. Depth (m): 0.20

Notes

The large, unnamed river is ~3 km downstream of the crossing. Cascades act as a barrier between the downstream river and the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 55

UTM: 17W 583387 / 7900856

Latitude / Longitude: 71°11'45.661" N / 78°40'53.816" W

Date / Time Surveyed: 9-Aug-07 / 05:15



Figure 1: View upstream of crossing 55



Figure 2: View across crossing 55 from left bank



Figure 3: View downstream of crossing 55

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): N/M

Notes

The large, unnamed river is ~3 km downstream of the crossing. A cascade and low water between the downstream river and the crossing act as barriers.

Crossing ID: 56

UTM: 17W 583535 / 7900806

Latitude / Longitude: 71°11'43.865" N / 78°40'39.210" W

Date / Time Surveyed: 9-Aug-07 / 05:02



Figure 1: View upstream of crossing 56



Figure 2: View across crossing 56 from right bank



Figure 3: View downstream of crossing 56

Watercourse Characteristics

Tributary Status: 3rd order trib of large river

Channel Pattern: slightly meandering

Crossing Site

Bankfull Width (m): 1.80

Wetted Width (m): 1.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.10

Flow Regime: persistent

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): 1.00-2.00 / 1.50-2.50

Max. Depth (m): 0.10-0.20

Downstream

Wetted / Bankfull Width (m): 1.00-2.00 / 1.50-2.50

Max. Depth (m): 0.10-0.20

Notes

The large, unnamed river is ~3 km downstream of the crossing. A cascade and low water between the downstream river and the crossing act as barriers.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 57

UTM: 17W 584019 / 7900636

Latitude / Longitude: 71°11'37.781" N / 78°39'51.474" W

Date / Time Surveyed: 10-Aug-07 / 00:01



Figure 1: View upstream of crossing 57



Figure 2: View across crossing 57 from right bank



Figure 3: View downstream of crossing 57

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: braided

Crossing Site

Bankfull Width (m): N/M (MSC)

Wetted Width (m): 1.10

Depth Profile (25%, 50%, 75%; m): 0.17, 0.07, 0.17

Max. Depth (m): 0.30

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): 2.20 / 2.20

Max. Depth (m): 0.23

Downstream

Wetted / Bankfull Width (m): 1.00-1.50 / MSC

Max. Depth (m): 0.30-0.50

Notes

The large, unnamed river is ~1.5 km downstream of the crossing.

Crossing ID: 58

UTM: 17W 584838 / 7900369

Latitude / Longitude: 71°11'28.146" N / 78°38'30.638" W

Date / Time Surveyed: 9-Aug-07 / 23:15



Figure 1: View upstream of crossing 58



Figure 2: View across crossing 58 from right bank



Figure 3: View downstream of crossing 58

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): 17.00

Wetted Width (m): 2.30

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.11

Flow Regime: intermittent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): >100.00 / >100.00

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): 1.20 / 7.00

Max. Depth (m): under rocks

Notes

The large, unnamed river is ~1.5 km downstream of the crossing. There is a small lake ~300 m downstream of the crossing. Boulders and low water downstream of the crossing site could potentially be a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 59

UTM: 17W 585145 / 7900251

Latitude / Longitude: 71°11'23.954" N / 78°38'0.412" W

Date / Time Surveyed: 9-Aug-07 / 23:25



Figure 1: View upstream of crossing 59



Figure 2: View across crossing 59 from right bank



Figure 3: View downstream of crossing 59

Watercourse Characteristics

Tributary Status:	1 st order trib of large river
Channel Pattern:	flooded terrestrial
Crossing Site	
Bankfull Width (m):	57.60
Wetted Width (m):	0.50
Depth Profile (25%, 50%, 75%; m):	N/M
Max. Depth (m):	0.05
Flow Regime:	intermittent – ephemeral
Gradient (°):	
Upstream	
Wetted / Bankfull Width (m):	N/M
Max. Depth (m):	N/M
Downstream	
Wetted / Bankfull Width (m):	under rocks
Max. Depth (m):	N/A

Notes

The large, unnamed river is ~1.5 km downstream of the crossing. There is a small lake ~ 300 m downstream of the crossing. Low water downstream of the crossing acts as a partial barrier.

Crossing ID: 60

UTM: 17W 585271 / 7900183

Latitude / Longitude: 71°11'21.602" N / 78°37'48.084" W

Date / Time Surveyed: 9-Aug-07 / 23:50



Figure 1: View upstream of crossing 60



Figure 2: View across crossing 60 from left bank



Figure 3: View downstream of crossing 60

Watercourse Characteristics

Tributary Status:	1 st order trib of large river
Channel Pattern:	sinuous
Crossing Site	
Bankfull Width (m):	5.00
Wetted Width (m):	no water
Depth Profile (25%, 50%, 75%; m):	N/A
Max. Depth (m):	N/A
Flow Regime:	ephemeral
Gradient (°):	2
Upstream	
Wetted / Bankfull Width (m):	no water
Max. Depth (m):	N/A
Downstream	
Wetted / Bankfull Width (m):	no water
Max. Depth (m):	N/A

Notes

The large, unnamed river is ~1.5 km downstream of the crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 61

UTM: 17W 585420 / 7900082

Latitude / Longitude: 71°11'18.156" N / 78°37'33.588" W

Date / Time Surveyed: 10-Aug-07 / 00:00



Figure 1: View upstream of crossing 61



Figure 2: View across crossing 61 from right bank



Figure 3: View downstream of crossing 61

Watercourse Characteristics

Tributary Status: 1st order trib of large lake

Channel Pattern: slightly meandering

Crossing Site

Bankfull Width (m): 35.70

Wetted Width (m): 27.40

Depth Profile (25%, 50%, 75%; m): 0.22, 0.29, 0.45

Max. Depth (m): 0.52

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): 22.80 / 25.50

Max. Depth (m): 0.42

Downstream

Wetted / Bankfull Width (m): > 25.00 / > 30.00

Max. Depth (m): 0.50-1.00

Notes

Angajurjualuk Lake is ~8 km downstream of the crossing. Cascades downstream of the crossing act as a partial barrier.

Crossing ID: 62

UTM: 17W 585843 / 7899702

Latitude / Longitude: 71°11'5.364" N / 78°36'52.810" W

Date / Time Surveyed: 10-Aug-07 / 00:40



Figure 1: View upstream of crossing 62



Figure 2: View across crossing 62 from right bank



Figure 3: View downstream of crossing 62

Watercourse Characteristics

Tributary Status: 3rd order trib of large lake

Channel Pattern: braided, flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 6.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.15

Flow Regime: intermittent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): under rocks

Max. Depth (m): N/A

Notes

Large, unnamed lake is ~4 km downstream of the crossing. Low water downstream of the crossing acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 63

UTM: 17W 586109 / 7899455

Latitude / Longitude: 71°10'57.060" N / 78°36'27.207" W

Date / Time Surveyed: 10-Aug-07 / 00:33



Figure 1: View upstream of crossing 63



Figure 2: View across crossing 63 from left bank



Figure 3: View downstream of crossing 63

Watercourse Characteristics

Tributary Status: 2nd order trib of large lake

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 8.80
Wetted Width (m): nearly dry
Depth Profile (25%, 50%, 75%; m): N/A
Max. Depth (m): N/A
Flow Regime: ephemeral
Gradient (°): 0.50

Upstream

Wetted / Bankfull Width (m): no water
Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): 0.90 / many channels
Max. Depth (m): 0.29

Notes

Large, unnamed lake is ~4 km downstream of the crossing.

Crossing ID: 64

UTM: 17W 586704 / 7898904

Latitude / Longitude: 71°10'38.529" N / 78°35'29.951" W

Date / Time Surveyed: 10-Aug-07 / 00:57



Figure 1: View upstream of crossing 64



Figure 2: View across crossing 64 from left bank



Figure 3: View downstream of crossing 64

Watercourse Characteristics

Tributary Status: 2nd order trib of large lake

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined
Wetted Width (m): undefined
Depth Profile (25%, 50%, 75%; m): 0.01, 0.05, 0.01
Max. Depth (m): 0.10
Flow Regime: intermittent
Gradient (°): 1

Upstream

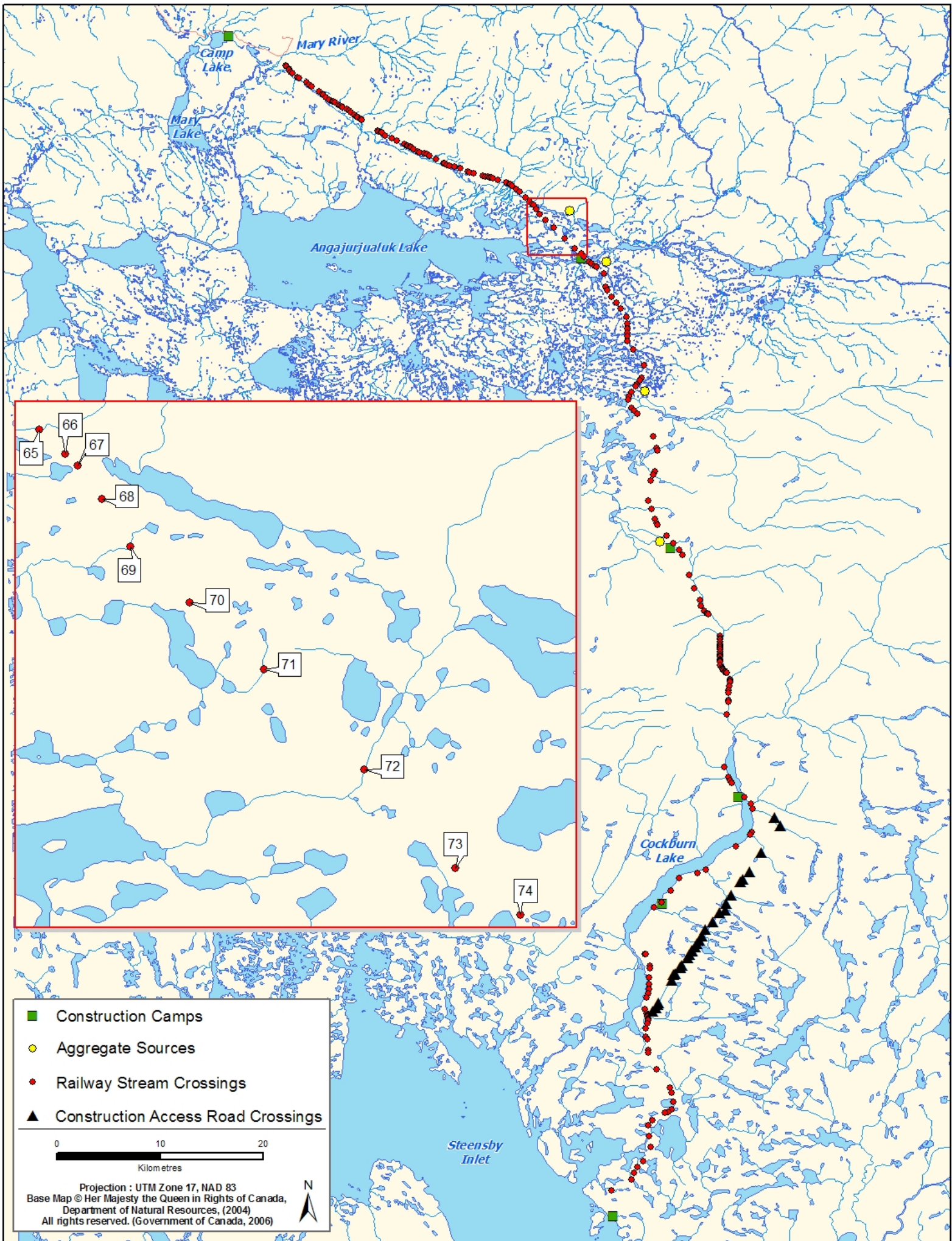
Wetted / Bankfull Width (m): N/M
Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): N/M
Max. Depth (m): < 0.10

Notes

There is a very small lake 0.5 km downstream of the crossing site and a large, unnamed lake ~3 km further downstream. Low water between the lake and the crossing acts as a barrier.



Rail Alignment Watercourse Crossing Assessments

Crossing ID: 65

UTM: 17W 587092 / 7898544

Latitude / Longitude: 71°10'26.420" N / 78°34'52.634" W

Date / Time Surveyed: 10-Aug-07 / 01:30



Figure 1: View upstream of crossing 65



Figure 2: View across crossing 65 from left bank



Figure 3: View downstream of crossing 65

Watercourse Characteristics

Tributary Status: 1st order trib of large lake

Channel Pattern: braided, sinuous

Crossing Site

Bankfull Width (m): N/M (MSC)

Wetted Width (m): 0.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.65

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): 8.00 / 12.70

Max. Depth (m): 0.10

Downstream

Wetted / Bankfull Width (m): > 0.50 / > 0.50

Max. Depth (m): 0.50-1.00

Notes

There is a small lake 400 m downstream of the crossing site and a large, unnamed lake ~3.5 km further downstream.

Crossing ID: 66

UTM: 17W 587366 / 7898291

Latitude / Longitude: 71°10'17.907" N / 78°34'26.284" W

Date / Time Surveyed: 10-Aug-07 / 01:10



Figure 1: View upstream of crossing 66



Figure 2: View across crossing 66 from right bank



Figure 3: View downstream of crossing 66

Watercourse Characteristics

Tributary Status: 3rd order trib of large lake

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): N/A (under rocks)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: intermittent

Gradient (°): 2.5

Upstream

Wetted / Bankfull Width (m): isolated ponds

Max. Depth (m): 0.40

Downstream

Wetted / Bankfull Width (m): isolated ponds

Max. Depth (m): 0.50

Notes

There is a small lake ~200 m downstream of the crossing site and a large, unnamed lake ~3.5 km further downstream.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 67

UTM: 17W 587493 / 7898166

Latitude / Longitude: 71°10'13.744" N / 78°34'14.100" W

Date / Time Surveyed: 10-Aug-07 / 01:30



Figure 1: View upstream of crossing 67



Figure 2: View across crossing 67 from left bank



Figure 3: View downstream of crossing 67

Watercourse Characteristics

Tributary Status: 2nd order trib of large lake

Channel Pattern: sinuous to meandering

Crossing Site

Bankfull Width (m): 9.00

Wetted Width (m): 8.00

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.35

Flow Regime: intermittent

Gradient (°): 3

Upstream

Wetted / Bankfull Width (m): isolated ponds

Max. Depth (m): 0.25

Downstream

Wetted / Bankfull Width (m): 18.2 / 37.3

Max. Depth (m): 0.35

Notes

There is a small lake ~100 m downstream of the crossing site and a large, unnamed lake ~3.5 km further downstream. Low water levels downstream of the crossing act as a barrier.

Crossing ID: 68

UTM: 17W 587745 / 7897818

Latitude / Longitude: 71°10'2.163" N / 78°33'50.341" W

Date / Time Surveyed: 10-Aug-07 / 01:55

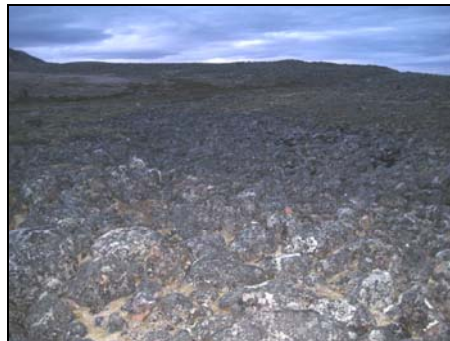


Figure 1: View upstream of crossing 68



Figure 2: View across crossing 68 from left bank

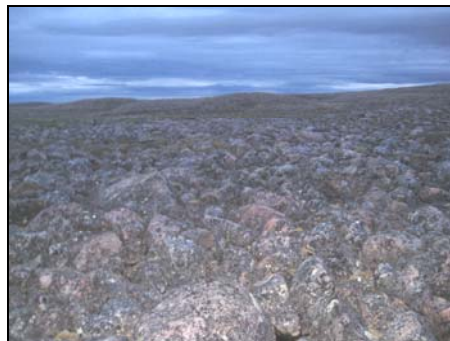


Figure 3: View downstream of crossing 68

Watercourse Characteristics

Tributary Status: 3rd order trib of large lake

Channel Pattern: sinuous to meandering

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: intermittent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

The large, unnamed lake is ~1.7 km downstream

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 69

UTM: 17W 588048 / 7897323

Latitude / Longitude: 71°9'45.806" N / 78°33'22.089" W /

Date / Time Surveyed: 10-Aug-07 / 02:15



Figure 1: View upstream of crossing 69



Figure 2: View across crossing 69 from left bank



Figure 3: View downstream of crossing 69

Watercourse Characteristics

Tributary Status: 3rd order trib of large lake

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 23.80

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.03

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.05

Downstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.05

Notes

There is a small lake ~0.6 km downstream of the crossing site and a large, unnamed lake ~1.5 km further downstream. Low water downstream of the crossing site acts as a barrier.

Crossing ID: 70

UTM: 17W 588668 / 7896737

Latitude / Longitude: 71°9'26.098" N / 78°32'22.588" W /

Date / Time Surveyed: 10-Aug-07 / 02:18



Figure 1: View upstream of crossing 70



Figure 2: View across crossing 70



Figure 3: View downstream of crossing 70

Watercourse Characteristics

Tributary Status: 1st order trib of small lake

Channel Pattern: braided, flooded terrestrial

Crossing Site

Bankfull Width (m): N/M (MSC)

Wetted Width (m): undefined

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.05

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.05

Downstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.05

Notes

There is a large lake ~100 m downstream of the crossing site. Low water levels between the lake and the crossing act as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 71

UTM: 17W 589438 / 7896038

Latitude / Longitude: 71°9'2.543" N / 78°31'8.620" W

Date / Time Surveyed: 10-Aug-07 / 02:37



Figure 1: View upstream of crossing 71



Figure 2: View across crossing 71 from right bank



Figure 3: View downstream of crossing 71

Watercourse Characteristics

Tributary Status: 1st order trib of large lake

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined (FT)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): 0.05

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.05

Downstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.05

Notes

Small lake ~0.8 km downstream and large, unnamed lake ~1 km downstream. Low water downstream of the crossing acts as a barrier.

Crossing ID: 72

UTM: 17W 590489 / 7894987

Latitude / Longitude: 71°8'27.253" N / 78°29'28.139" W

Date / Time Surveyed: 10-Aug-07 / 03:10



Figure 1: View upstream of crossing 72



Figure 2: View across crossing 72 from left bank

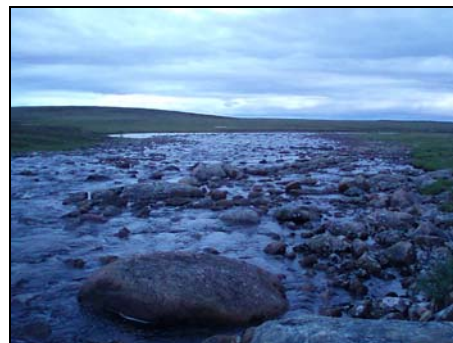


Figure 3: View downstream of crossing 72

Watercourse Characteristics

Tributary Status: 1st order trib of Angajurjua Lake

Channel Pattern: slightly meandering

Crossing Site

Bankfull Width (m): 21.90

Wetted Width (m): 21.90

Depth Profile (25%, 50%, 75%; m): 0.21, 0.20, 0.42

Max. Depth (m): 0.42

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): 15.00-20.00 / > 20.00

Max. Depth (m): 0.25-0.50

Downstream

Wetted / Bankfull Width (m): > 20.00 / > 20.00

Max. Depth (m): > 0.50

Notes

Angajurjua Lake is ~2 km downstream.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 73

UTM: 17W 591440 / 7893960

Latitude / Longitude: 71°7'52.858" N / 78°27'57.622" W

Date / Time Surveyed: 10-Aug-07 / 03:05



Figure 1: View upstream of crossing 73



Figure 2: View across crossing 73 from left bank



Figure 3: View downstream of crossing 73

Watercourse Characteristics

Tributary Status: 2nd order trib of Ravn R.

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined (FT)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): small lake

Max. Depth (m): N/A

Notes

The Ravn River is ~1 km downstream. There is a small lake ~200 m downstream of the crossing site. Low water levels between the lake and the crossing act as a barrier.

Crossing ID: 74

UTM: 17W 592117 / 7893473

Latitude / Longitude: 71°7'36.237" N / 78°26'52.213" W

Date / Time Surveyed: 10-Aug-07 / 03:20



Figure 1: View upstream of crossing 74



Figure 2: View across crossing 74 from right bank



Figure 3: View downstream of crossing 74

Watercourse Characteristics

Tributary Status: 1st order trib of Ravn R.

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 2.00

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): 0.03

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

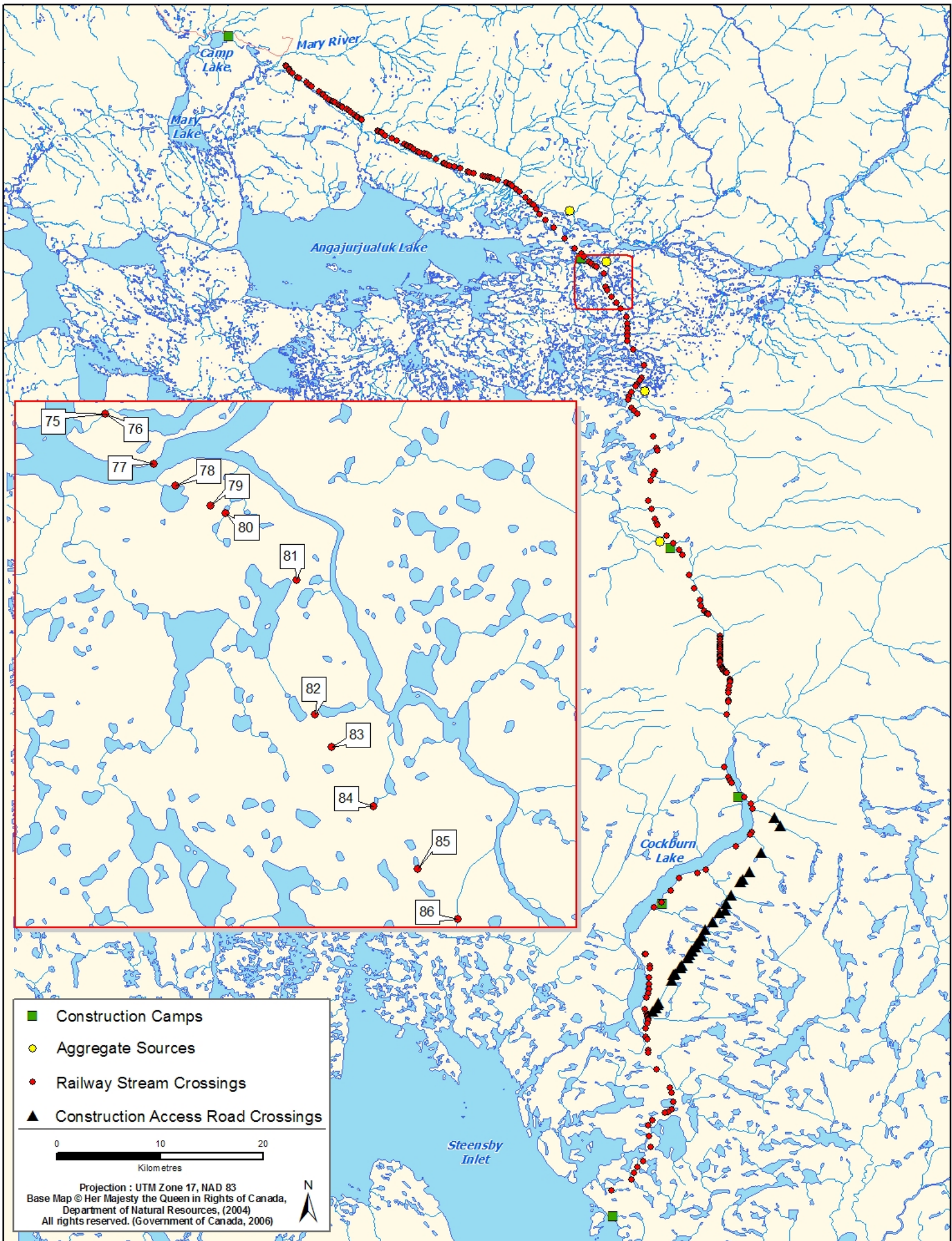
Downstream

Wetted / Bankfull Width (m): Ravn River

Max. Depth (m): N/A

Notes

The Ravn River is ~100 m downstream of the crossing site. There is a steep drop between the Ravn River and the crossing that acts as a barrier.



Rail Alignment Watercourse Crossing Assessments

Crossing ID: 75 & 76

UTM: 17W 592377 / 7893222

Latitude / Longitude: 71°7'27.789" N / 78°26'27.371" W

Date / Time Surveyed: 10-Aug-07 / 03:35



Figure 1: View upstream of crossings 75 & 76



Figure 2: View across crossings 75 & 76 from left bank



Figure 3: View downstream of crossings 75 & 76

Watercourse Characteristics

Tributary Status: 1st order trib of Ravn R.

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined (FT)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

Low water levels downstream of the crossing site act as a barrier between crossing and Ravn River, which is ~0.5 km downstream.

Crossing ID: 77

UTM: 17W 592860 / 7892727

Latitude / Longitude: 71°7'11.167" N / 78°25'41.358" W

Date / Time Surveyed: 10-Aug-07 / 03:45



Figure 1: View upstream of crossings 77



Figure 2: View across crossing 77 from right bank



Figure 3: View downstream of crossings 77

Watercourse Characteristics

Tributary Status: 1st order trib of Angajurjualuk L.

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 171.00

Wetted Width (m): 126.20

Depth Profile (25%, 50%, 75%; m): too fast to measure

Max. Depth (m): too fast to measure

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): > 100.00 / > 150.00

Max. Depth (m): too fast to measure

Downstream

Wetted / Bankfull Width (m): > 100.00 / > 150.00

Max. Depth (m): too fast to measure

Notes

This site is the Ravn River.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 78

UTM: 17W 593078 / 7892513

Latitude / Longitude: 71°7'3.967" N / 78°25'20.558" W

Date / Time Surveyed: 10-Aug -07 / 04:00



Figure 1: View across crossing 78 from right bank



Figure 2: View downstream of crossing 78

Watercourse Characteristics

Tributary Status: 2nd order trib of Ravn R.

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): small lake

Max. Depth (m): 0.50 – 1.00

Notes

There is a small lake immediately downstream of the crossing site, which is ~100 m upstream of the Ravn River.

Crossing ID: 79

UTM: 17W 593429 / 7892306

Latitude / Longitude: 71°6'56.810" N / 78°24'46.491" W

Date / Time Surveyed: 10-Aug-07 / 04:10



Figure 1: View downstream of crossing 79

Watercourse Characteristics

Tributary Status: not a tributary

Channel Pattern: no channel

Crossing Site

Bankfull Width (m): never any water

Wetted Width (m): N/A

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: none

Gradient (°): N/A

Upstream

Wetted / Bankfull Width (m): N/A

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/A

Max. Depth (m): N/A

Notes

This crossing is not likely wet at any point during the year, so this should not actually be considered a crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 80

UTM: 17W 593575 / 7892235

Latitude / Longitude: 71°6'54.319" N / 78°24'32.259" W

Date / Time Surveyed: 10-Aug-07 / 04:20



Figure 1: View upstream of crossing 80



Figure 2: View across crossing 80 from left bank



Figure 3: View downstream of crossing 80

Watercourse Characteristics

Tributary Status: 2nd order trib of Ravn R.

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined (FT)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): small lake

Max. Depth (m): N/A

Notes

The Ravn River is ~0.5 km downstream. There is a small lake ~100 m downstream of the crossing site. A dry stretch between the lake and the crossing acts as a barrier.

Crossing ID: 81

UTM: 17W 594279 / 7891573

Latitude / Longitude: 71°6'31.997" N / 78°23'25.016" W

Date / Time Surveyed: 10-Aug-07 / 04:22

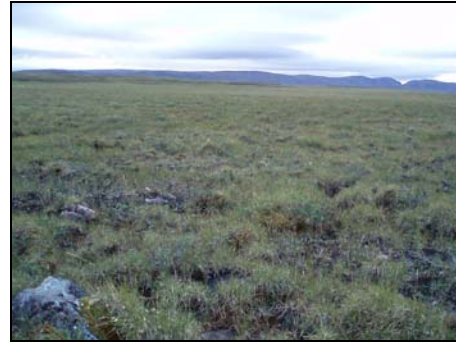


Figure 1: View upstream of crossing 81



Figure 2: View across crossing 81



Figure 3: View downstream of crossing 81

Watercourse Characteristics

Tributary Status: 1st order trib of small lake

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined (MSC)

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): 0.5

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): small lake

Max. Depth (m): N/A

Notes

The Ravn River is ~3 km downstream of the crossing. There is a small lake ~100 m downstream of the crossing site. A dry stretch between the lake and the crossing acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 82

UTM: 17W 594461 / 7890237

Latitude / Longitude: 71°5'48.666" N / 78°23'12.645" W

Date / Time Surveyed: 10-Aug-07 / 04:40

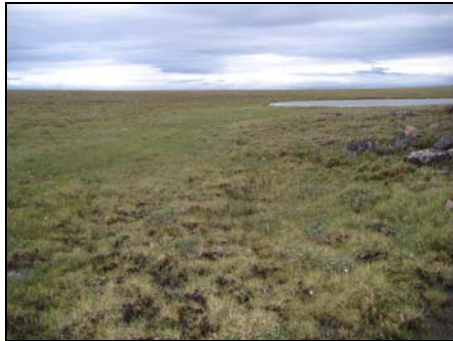


Figure 1: View upstream of crossing 82



Figure 2: View across crossing 82 from left bank

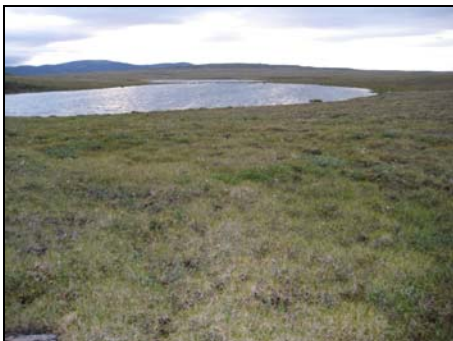


Figure 3: View downstream of crossing 82

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined (FT)

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): pond

Max. Depth (m): N/A

Notes

Large, unnamed river is ~0.5 km downstream.

Crossing ID: 83

UTM: 17W 594631 / 7889909

Latitude / Longitude: 71°5'37.852" N / 78°22'57.148" W

Date / Time Surveyed: 10-Aug-07 / 04:50



Figure 1: View upstream of crossing 83



Figure 2: View across crossing 83 from right bank

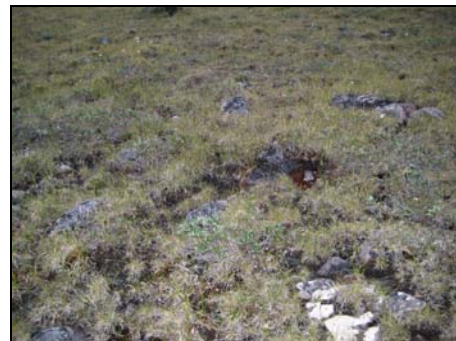


Figure 3: View downstream of crossing 83

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

Large, unnamed river is ~0.5 km downstream.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 84

UTM: 17W 595046 / 7889321

Latitude / Longitude: 71°5'18.313" N / 78°22'18.418" W

Date / Time Surveyed: 11-Aug-07 / 03:45



Figure 1: View upstream of crossing 84



Figure 2: View across crossing 84 from right bank

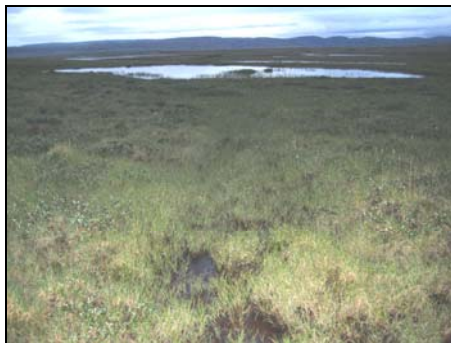


Figure 3: View downstream of crossing 84

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 0.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.15

Flow Regime: ephemeral

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): pond

Max. Depth (m): N/M

Notes

The large, unnamed river is ~1 km downstream. Low water downstream of the crossing acts as a barrier.

Crossing ID: 85

UTM: 17W 595486 / 7888698

Latitude / Longitude: 71°4'57.608" N / 78°21'37.377" W

Date / Time Surveyed: 11-Aug-07 / 04:00



Figure 1: View upstream of crossing 85



Figure 2: View across crossing 85 from right bank



Figure 3: View downstream of crossing 85

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°):

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): pond

Max. Depth (m): N/M

Notes

The large, unnamed river is ~1.5 km downstream. Low water downstream of the crossing acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 86**UTM:** 17W 595881 / 7888203**Latitude / Longitude:** 71°4'41.090" N / 78°21'0.274" W**Date / Time Surveyed:** 11-Aug-07 / 04:08

Figure 1: View upstream of crossing 86



Figure 2: View across crossing 86 from left bank



Figure 3: View downstream of crossing 86

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 1.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.05

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.10

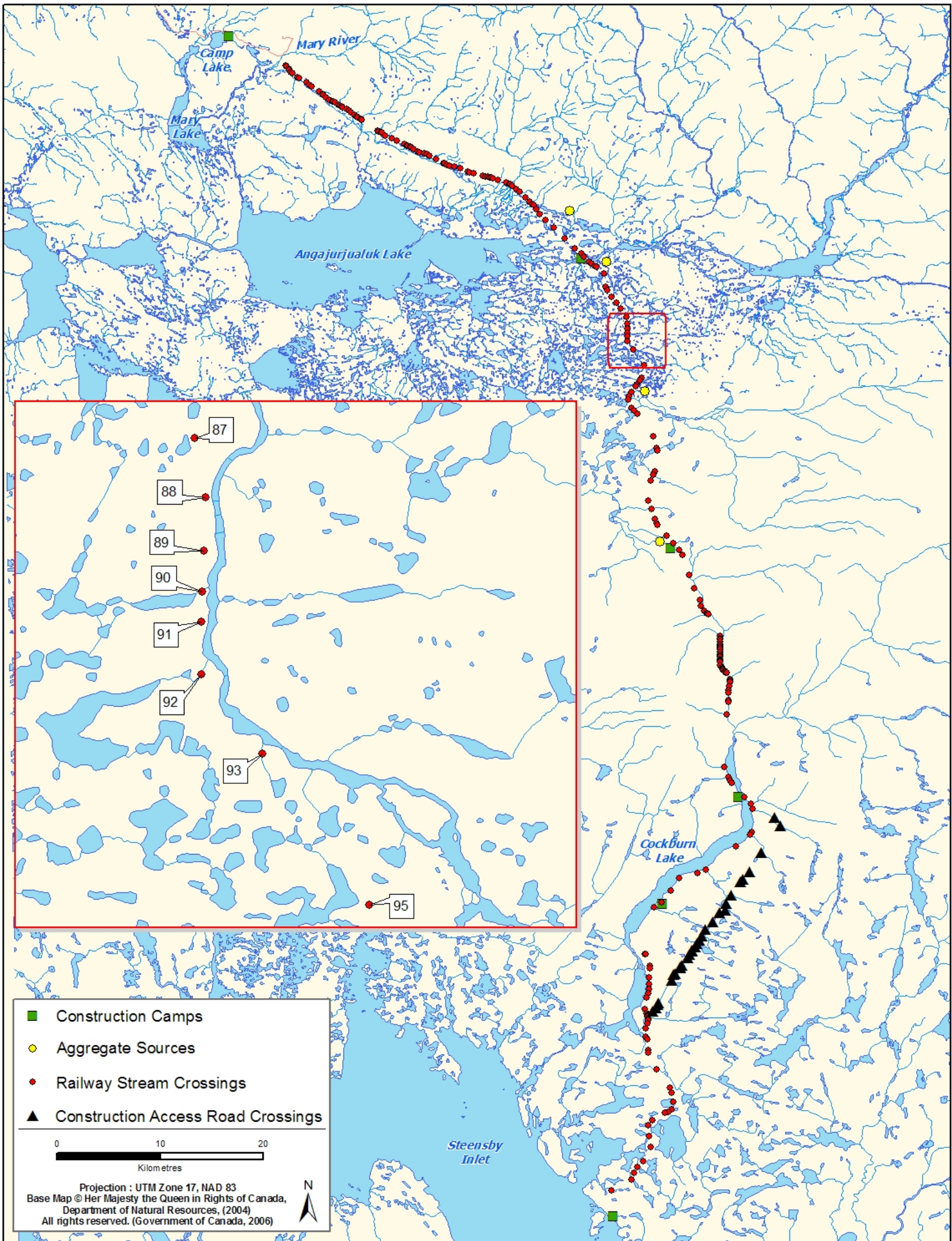
Downstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.10

Notes

The large, unnamed river is ~1 km downstream. Low water downstream of the crossing acts as a barrier.



Rail Alignment Watercourse Crossing Assessments

Crossing ID: 87**UTM:** 17W 596485 / 7887328**Latitude / Longitude:** 71°4'12.022" N / 78°20'4.089" W**Date / Time Surveyed:** 11-Aug-07 / 04:20

Figure 1: View upstream of crossing 87



Figure 2: View across crossing 87 from right bank



Figure 3: View downstream of crossing 87

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): < 0.05

Notes

The large, unnamed river is ~1 km downstream. Low water downstream of the crossing acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 88

UTM: 17W 596594 / 7886739

Latitude / Longitude: 71°3'52.876" N / 78°19'55.842" W

Date / Time Surveyed: 11-Aug-07 / 04:30



Figure 1: View upstream of crossing 88



Figure 2: View across crossing 88 from left bank

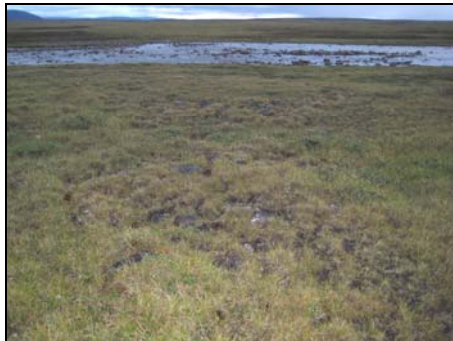


Figure 3: View downstream of crossing 88

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

Large, unnamed river is ~50 m downstream of crossing.

Crossing ID: 89

UTM: 17W 596576 / 7886207

Latitude / Longitude: 71°3'35.748" N / 78°19'59.956" W

Date / Time Surveyed: 11-Aug-07 / 04:40



Figure 1: View upstream of crossing 89



Figure 2: View across crossing 89 from left bank

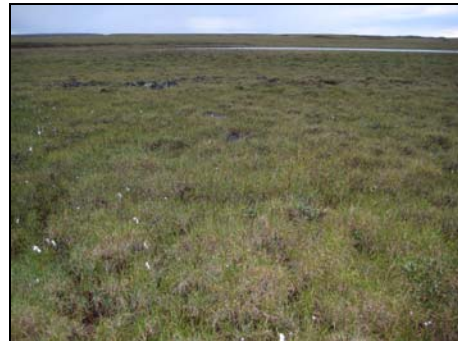


Figure 3: View downstream of crossing 89

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

Large, unnamed river is ~100 m downstream of crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 90

UTM: 17W 596561 / 7885802

Latitude / Longitude: 71°3'22.711" N / 78°20'3.216" W

Date / Time Surveyed: 11-Aug-07 / 04:50

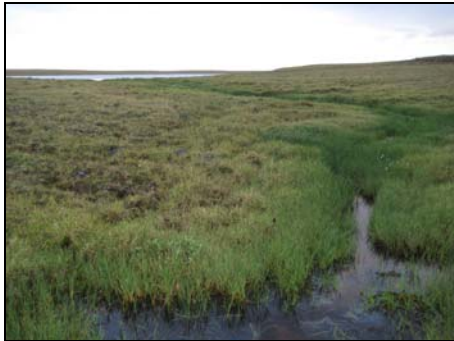


Figure 1: View upstream of crossing 90



Figure 2: View across crossing 90 from left bank



Figure 3: View downstream of crossing 90

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 2.00

Wetted Width (m): 0.80

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.43

Flow Regime: persistent

Gradient (°): 2

Upstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

The large, unnamed river is ~50 m downstream of crossing.

Crossing ID: 91

UTM: 17W 596551 / 7885501

Latitude / Longitude: 71°3'13.020" N / 78°20'5.524" W

Date / Time Surveyed: 11-Aug-07 / 04:42

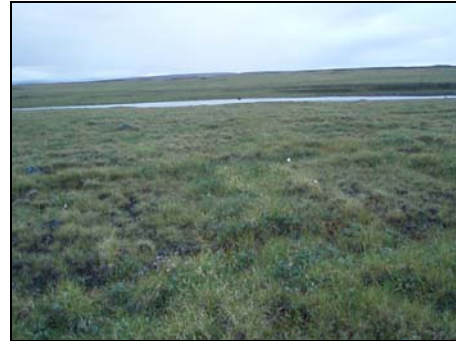


Figure 1: View upstream of crossing 91



Figure 2: View across crossing 91 from left bank



Figure 3: View downstream of crossing 91

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

The large, unnamed river is ~50 m downstream of crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 92

UTM: 17W 596551 / 7884977

Latitude / Longitude: 71°2'56.125" N / 78°20'7.813" W

Date / Time Surveyed: 11-Aug-07 / 04:10



Figure 1: View upstream of crossing 92



Figure 2: View across crossing 92 from left bank



Figure 3: View downstream of crossing 92

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 0.80

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.31

Flow Regime: intermittent – persistent

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): 0.80 / undefined

Max. Depth (m): 0.30

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

There is a large, unnamed river ~100 m downstream of the crossing site, and a large pond upstream of it.

Crossing ID: 93

UTM: 17W 597159 / 7884187

Latitude / Longitude: 71°2'29.787" N / 78°19'10.962" W

Date / Time Surveyed: 11-Aug-07 / 3:45



Figure 1: View upstream of crossing 93



Figure 2: View across crossing 93



Figure 3: View downstream of crossing 93

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: isolated pools

Crossing Site

Bankfull Width (m): undefined (IP)

Wetted Width (m): ~ 0.50

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): 0.15

Flow Regime: ephemeral

Gradient (°): 0.5

Upstream

Wetted / Bankfull Width (m): isolated pools

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

The large, unnamed river is ~50 m downstream of crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 95**UTM:** 17W 598223 / 7882688**Latitude / Longitude:** 71°1'39.929" N / 78°17'32.092" W**Date / Time Surveyed:** 11-Aug-07 / 05:05

Figure 1: View upstream of crossing 95



Figure 2: View across crossing 95 from left bank



Figure 3: View downstream of crossing 95

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined (FT)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): 0.04

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): flooded terrestrial

Max. Depth (m): N/M

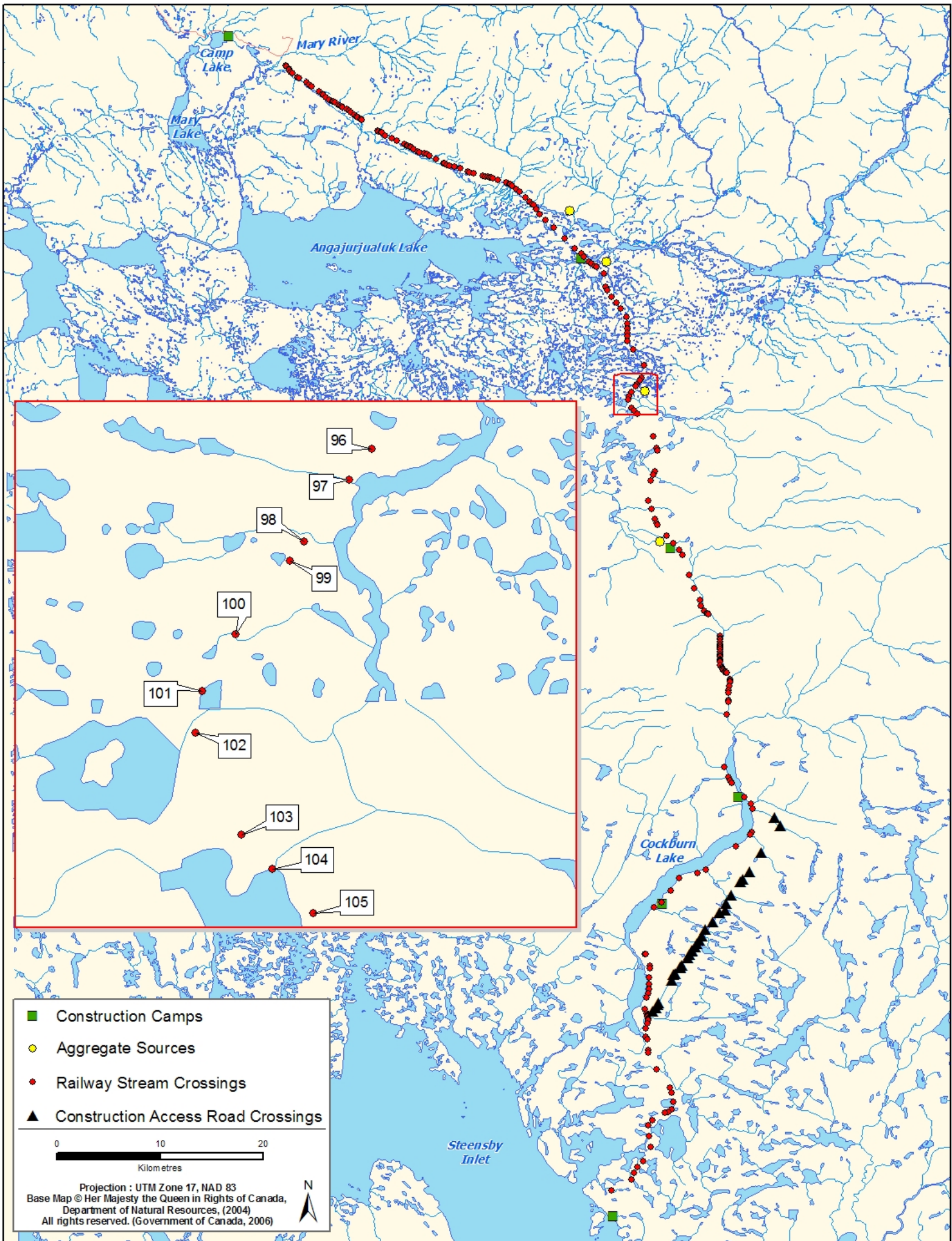
Downstream

Wetted / Bankfull Width (m): 0.15 / undefined

Max. Depth (m): 0.03

Notes

There are several lakes downstream between the crossing and the large, unnamed river. Low water between the lake and the crossing acts as a barrier.



Rail Alignment Watercourse Crossing Assessments

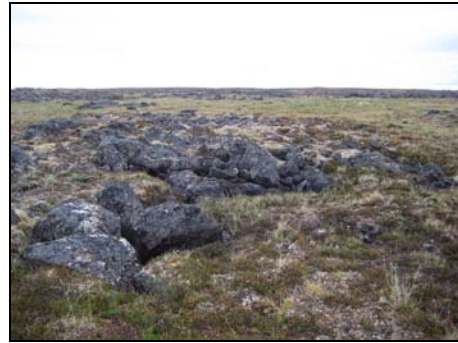
Crossing ID: 96**UTM:** 17W 597961 / 7881471**Latitude / Longitude:** 71°1'1.067" N / 78°18'3.433" W**Date / Time Surveyed:** 11-Aug-07 / 05:15

Figure 1: View upstream of crossing 96

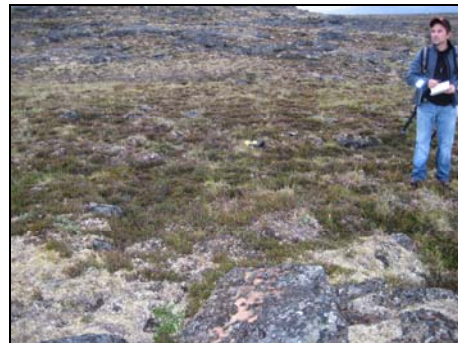


Figure 2: View across crossing 96 from right bank

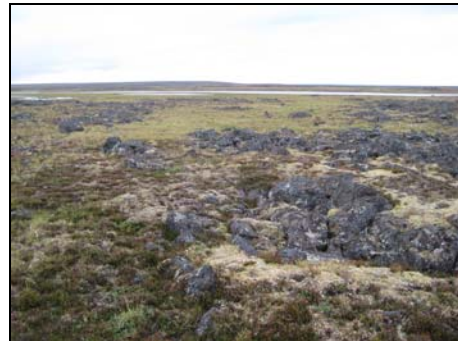


Figure 3: View downstream of crossing 96

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

The large, unnamed river is ~200 m downstream of crossing.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 97

UTM: 17W 597790 / 7881239

Latitude / Longitude: 71°0'53.832" N / 78°18'21.393" W

Date / Time Surveyed: 11-Aug-07 / 05:20



Figure 1: View upstream of crossing 97

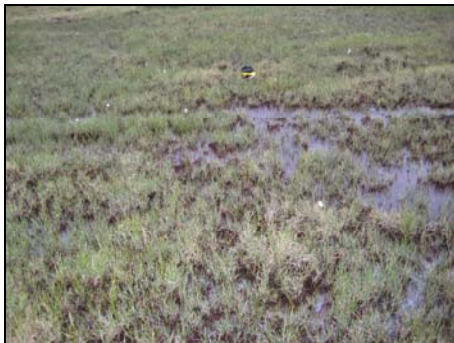


Figure 2: View across crossing 97 from left bank

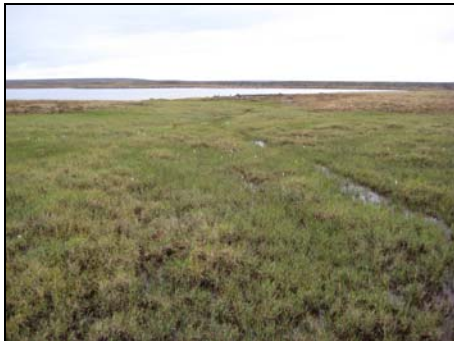


Figure 3: View downstream of crossing 97

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 20.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): 0.05

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): ~0.05

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

The large, unnamed river is ~50 m downstream of crossing. Low water between the river and the crossing acts as a barrier.

Crossing ID: 98

UTM: 17W 597451 / 7880777

Latitude / Longitude: 71°0'39.422" N / 78°18'56.997" W

Date / Time Surveyed: 11-Aug-07 / 05:30

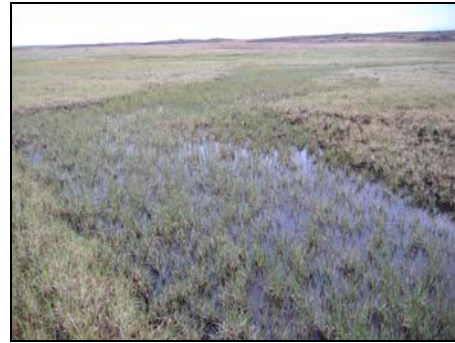


Figure 1: View upstream of crossing 98



Figure 2: View across crossing 98 from left bank



Figure 3: View downstream of crossing 98

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): 1.50

Depth Profile (25%, 50%, 75%; m): N/M

Max. Depth (m): N/M

Flow Regime: ephemeral – intermittent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): undefined

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): large river

Max. Depth (m): N/A

Notes

The large, unnamed river is ~200 m downstream of crossing. Low water upstream of the crossing site acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 99

UTM: 17W 597346 / 7880635

Latitude / Longitude: 71°0'34.993" N / 78°19'8.016" W

Date / Time Surveyed: 11-Aug-07 / 05:40



Figure 1: View upstream of crossing 99



Figure 2: View across crossing 99 from left bank

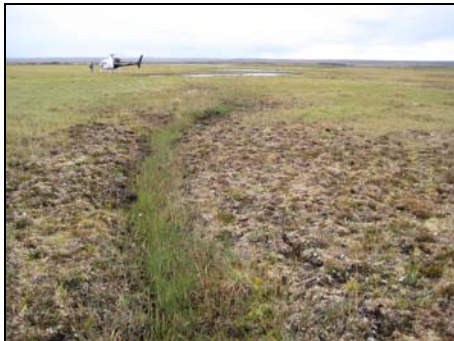


Figure 3: View downstream of crossing 99

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 0.45
Wetted Width (m): no water
Depth Profile (25%, 50%, 75%; m): N/A
Max. Depth (m): N/A
Flow Regime: ephemeral
Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): pond
Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): N/M
Max. Depth (m): N/M

Notes

The large, unnamed river is ~400 m downstream of crossing.

Crossing ID: 100

UTM: 17W 596938 / 7880079

Latitude / Longitude: 71°0'17.647" N / 78°19'50.841" W

Date / Time Surveyed: 11-Aug-07 / 05:30



Figure 1: View upstream of crossing 100



Figure 2: View across crossing 100 from left bank



Figure 3: View downstream of crossing 100

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined
Wetted Width (m): undefined (FT)
Depth Profile (25%, 50%, 75%; m): N/A
Max. Depth (m): 0.15
Flow Regime: persistent – intermittent
Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water
Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): isolated pools
Max. Depth (m): ~0.15

Notes

The large, unnamed river is ~1.1 k m downstream of crossing. There is no water upstream of the crossing site, which acts as a barrier.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 101

UTM: 17W 596688 / 7879658

Latitude / Longitude: 71°0'4.428" N / 78°20'17.421" W

Date / Time Surveyed: 11-Aug-07 / 22:01



Figure 1: View upstream of crossing 101



Figure 2: View across crossing 101 from left bank



Figure 3: View downstream of crossing 101

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: undefined

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): N/M

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): pond

Max. Depth (m): N/A

Notes

A large, unnamed river is ~1.5 km downstream of crossing. There is a small lake/pond immediately downstream of the crossing site.

Crossing ID: 102

UTM: 17W 596638 / 7879339

Latitude / Longitude: 70°59'54.213" N / 78°20'23.757" W

Date / Time Surveyed: 11-Aug-07 / 22:11



Figure 1: View upstream of crossing 102



Figure 2: View across crossing 102 from left bank



Figure 3: View downstream of crossing 102

Watercourse Characteristics

Tributary Status: 2nd order trib of large river

Channel Pattern: meandering

Crossing Site

Bankfull Width (m): undefined (FT)

Wetted Width (m): 2.30

Depth Profile (25%, 50%, 75%; m): 0.05, 0.18, 0.07

Max. Depth (m): 0.18

Flow Regime: persistent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): 2.30 / flooded terrestrial

Max. Depth (m): ~ 1.00

Downstream

Wetted / Bankfull Width (m): small lake

Max. Depth (m): N/A

Notes

The large, unnamed river is ~1.5 km downstream of crossing. There is a small lake immediately downstream of the crossing site.

Rail Alignment Watercourse Crossing Assessments

Crossing ID: 103

UTM: 17W 596985 / 7878575

Latitude / Longitude: 70°59'29.086" N / 78°19'52.750" W

Date / Time Surveyed: 11-Aug-07 / 22:03



Figure 1: View upstream of crossing 103



Figure 2: View across crossing 103 from right bank



Figure 3: View downstream of crossing 103

Watercourse Characteristics

Tributary Status: 1st order trib of large lake

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): no water

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/A

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Downstream

Wetted / Bankfull Width (m): no water

Max. Depth (m): N/A

Notes

A large, unnamed lake is ~200 m downstream.

Crossing ID: 104

UTM: 17W 597216 / 7878322

Latitude / Longitude: 70°59'20.600" N / 78°19'31.004" W

Date / Time Surveyed: 11-Aug-07 / 22:10



Figure 1: View upstream of crossing 104

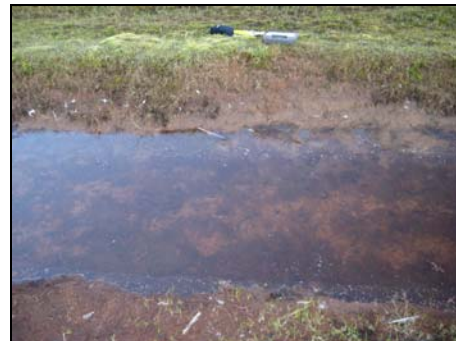


Figure 2: View across crossing 104 from right bank



Figure 3: View downstream of crossing 104

Watercourse Characteristics

Tributary Status: 1st order trib of large river

Channel Pattern: sinuous

Crossing Site

Bankfull Width (m): 1.70

Wetted Width (m): 1.20

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): 0.04

Flow Regime: intermittent

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): large pond

Max. Depth (m): < 1.00

Downstream

Wetted / Bankfull Width (m): small lake

Max. Depth (m): N/A

Notes

A large, unnamed river is ~0.8 km downstream. A small lake is ~200 m downstream from crossing. Low water downstream of the crossing acts as a partial barrier.

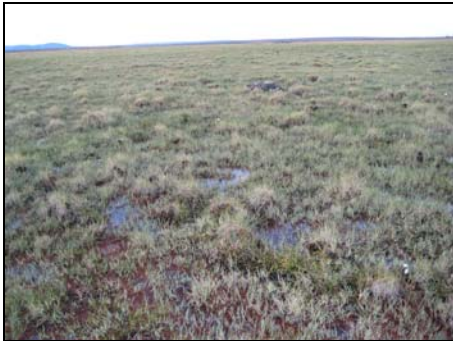
Rail Alignment Watercourse Crossing Assessments

Crossing ID: 105

UTM: 17W 597522 / 7877988

Latitude / Longitude: 70°59'9.395" N / 78°19'2.201" W

Date / Time Surveyed: 11-Aug-07 / 22:23

**Figure 1:** View upstream of crossing 105**Figure 2:** View across crossing 105 from right bank**Figure 3:** View downstream of crossing 105**Watercourse Characteristics**Tributary Status: 1st order trib of large lake

Channel Pattern: flooded terrestrial

Crossing Site

Bankfull Width (m): undefined

Wetted Width (m): undefined (FT)

Depth Profile (25%, 50%, 75%; m): N/A

Max. Depth (m): N/M

Flow Regime: ephemeral

Gradient (°): 1

Upstream

Wetted / Bankfull Width (m): N/M

Max. Depth (m): N/M

Downstream

Wetted / Bankfull Width (m): lake/pond

Max. Depth (m): N/A

Notes

The large, unnamed lake/pond is ~100 m downstream. Low water downstream of the crossing site acts as a barrier.