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LEGEND:

- ACCESS ROAD CROSSING SURVEY YEAR

 - 2007
 - 2008
 - 2010
- STREAM CROSSING

 - FISH BARRIER (CONFIRMED)
 - FISH BARRIER (AERIAL PHOTO INTERPRETATION)
- CONTOUR

 - MILNE INLET TOTE ROAD (EXISTING)
 - RAILWAY ALIGNMENT (PROPOSED)
 - CONSTRUCTION ACCESS ROAD (PROPOSED)
- WATER

 - INFRASTRUCTURE

NOTES:

- BASE MAP 1:50,000 © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009) ALL RIGHTS RESERVED.
- TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
- PROPOSED RAILWAY ALIGNMENT PROVIDED BY CANRAIL CONSULTANTS INC.
- PROPOSED RAILWAY CONSTRUCTION ACCESS ROAD ALIGNMENT PROVIDED BY CANRAIL CONSULTANTS INC. DRAWING NO. RAILWAY ALIGNMENT AND CONST ACCESS RD - MARY RIVER STEENSBY 2010 -12AUG2010.DWG
- LOCATION OF PROPOSED INFRASTRUCTURE IS APPROXIMATE AND SUBJECT TO FIELD ADJUSTMENTS
- CONTOUR INTERVAL IS 25 AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

Access Road Stream Crossing Sites (MAP K)



P/A NO.	REF NO.
-	-
DATE: 19/11/2010	REV 2

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-011a
UTM Coordinates: 17 W 600316 7812164

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

Floodplain Width (m):	N/M	Channel Pattern:	N/M	Stage:	N/A
Channel Confinement:	N/M	Channel Gradient (range):	N/M	Flow Regime:	INT
Bank Height (range in m):	N/M	Bank Shape:	N/M	T_w (°C):	N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted:	N	Effort (min):	N/A	Electrofisher Settings:	N/A
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Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	No	No
NNST	No	No	No	No

Comments & Summary

Saturated wetted connection between two shallow waterbodies (each < 3 m deep) that are unlikely to support fish.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

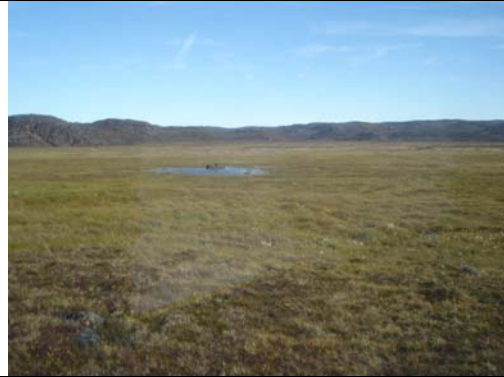
Crossing ID: AR-011a
UTM Coordinates: 17 W 600316 7812164

Date/Time Surveyed: 26-Aug-10

Photographs



A



B



C

Figure 1. View of crossing area (A), view upstream of crossing (B), view downstream of crossing (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-010a
UTM Coordinates: 17 W 599526 7811586

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

Floodplain Width (m):	N/M	Channel Pattern:	N/M	Stage:	N/A
Channel Confinement:	N/M	Channel Gradient (range):	N/M	Flow Regime:	EPH
Bank Height (range in m):	N/M	Bank Shape:	N/M	T_w (°C):	N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted:	N	Effort (min):	N/A	Electrofisher Settings:	N/A
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Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	No	No
NNST	No	No	No	No

Comments & Summary

Ephemeral saturated drain with disjoined, undefined channel. Drains into AR-009A.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-010a
UTM Coordinates: 17 W 599526 7811586

Date/Time Surveyed: 26-Aug-10

Photographs



A



B

Figure 1. Aerial view of crossing looking upstream (A), aerial view of crossing looking downstream (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-009a
UTM Coordinates: 17 W 598690 7810889

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

Floodplain Width (m):	N/M	Channel Pattern:	N/M	Stage:	N/A
Channel Confinement:	N/M	Channel Gradient (range):	N/M	Flow Regime:	INT
Bank Height (range in m):	N/M	Bank Shape:	N/M	T_w (°C):	N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted:	N	Effort (min):	N/A	Electrofisher Settings:	N/A
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Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	No	No
NNST	No	No	No	No

Comments & Summary

Intermittent drainage with no defined channel. Drains into potential fish bearing waterbody (> 4 m deep); however, between waterbody and crossing location, the drain had an un-stepped gradient > 30%. Crossing location not accessible to fish from downstream waterbody. No headwater waterbody.

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Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-009a
UTM Coordinates: 17 W 598690 7810889

Date/Time Surveyed: 26-Aug-10

Photographs

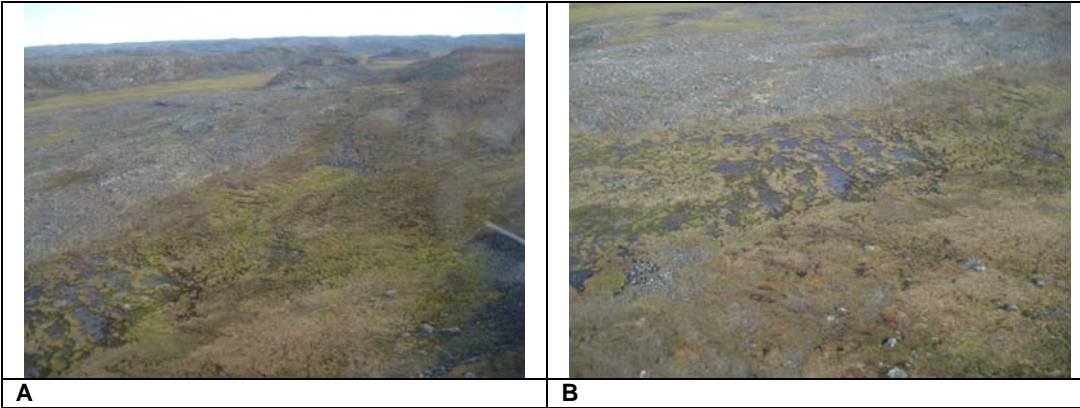


Figure 1. Aerial view of crossing location (A), close-up aerial view of crossing location (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-008
UTM Coordinates: 17 W 598461 7809104

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

Floodplain Width (m):	N/M	Channel Pattern:	UD	Stage:	N/A
Channel Confinement:	N/M	Channel Gradient (range):	N/M	Flow Regime:	EPH
Bank Height (range in m):	N/M	Bank Shape:	N/M	T_w (°C):	N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted:	N	Effort (min):	N/A	Electrofisher Settings:	N/A
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Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	No	No
NNST	No	No	Moderate	No

Comments & Summary

Ephemeral saturated drain with no defined channel. Drains into potential fish bearing waterbody (> 4 m deep); therefore, assumed rearing habitat for NNST.

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Mary River Project



Fish Habitat Quality – MARGINAL

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-008
UTM Coordinates: 17 W 598461 7809104

Date/Time Surveyed: 26-Aug-10

Photographs



A



B



C

Figure 1. Aerial view looking upstream from crossing location (A), aerial view of drain inlet to waterbody (B), aerial view of crossing location (C).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-006
UTM Coordinates: 17 W 598616 7807498

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

Floodplain Width (m):	N/M	Channel Pattern:	N/M	Stage:	N/A
Channel Confinement:	N/M	Channel Gradient (range):	N/M	Flow Regime:	EPH
Bank Height (range in m):	N/M	Bank Shape:	N/M	T_w (°C):	N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted:	N	Effort (min):	N/A	Electrofisher Settings:	N/A
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Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	No	No
NNST	No	No	No	No

Comments & Summary

Ephemeral saturated drain with no defined channel. Drains into a shallow waterbody (< 3 m deep) that is unlikely to support fish.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-006
UTM Coordinates: 17 W 598616 7807498

Date/Time Surveyed: 26-Aug-10

Photographs

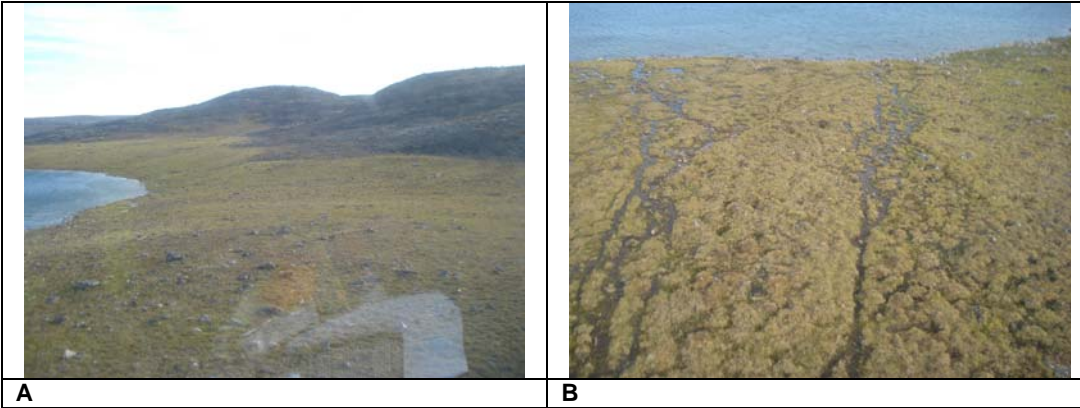


Figure 1. Aerial view of drainage (A), aerial view of crossing location (B)

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-004
UTM Coordinates: 17 W 598047 7805662

Date/Time Surveyed: 26-Aug-10

General Physical Characteristics

Floodplain Width (m):	N/M	Channel Pattern:	UD	Stage:	N/A
Channel Confinement:	N/M	Channel Gradient (range):	N/M	Flow Regime:	EPH
Bank Height (range in m):	N/M	Bank Shape:	N/M	T_w (°C):	N/M

Hydrology & Habitat Characteristics

N/M

Fisheries Information

Electrofishing Conducted:	N	Effort (min):	N/A	Electrofisher Settings:	N/A
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Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	No	No
NNST	No	No	No	No

Comments & Summary

Ephemeral saturated drain with no defined channel. Drains into a shallow waterbody (< 3 m deep) that is unlikely to support fish.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – NO FISH HABITAT

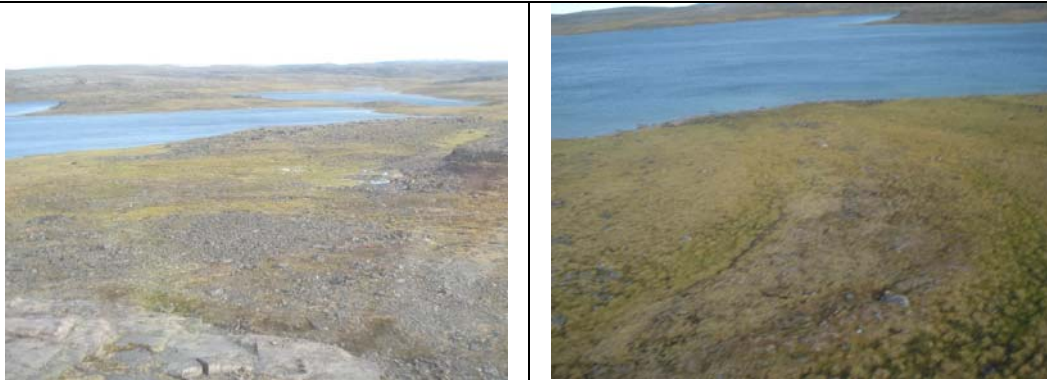
Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-004
UTM Coordinates: 17 W 598047 7805662

Date/Time Surveyed: 26-Aug-10

Photographs



A

B

Figure 1. Aerial view of drainage (A), aerial view of crossing location (B).

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-003a
UTM Coordinates: 17 W 597454 7805480

Date/Time Surveyed: 6-Sept-08 /14:19

General Physical Characteristics

Floodplain Width (m):	N/M	Channel Pattern:	Braided, straight	Stage:	Normal
Channel Confinement:	PC	Channel Gradient (range):	1.5°	Flow Regime:	PER
Bank Height (range in m):	UD-2.5	Bank Shape:	70% V, 30% S	T_w (°C):	4.0

Hydrology & Habitat Characteristics

Distance and Direction from Crossing (m)	Channel Width (m)		Water Depth (m)				Water Velocity (m/s)			
	Wetted	High Water	25%	50%	75%	Max	25%	50%	75%	Max
60D (1 chnls)	44	44	0.07	0.17	0.18	0.37	0.36	0.09	1.32	1.32
40D (3 chnls)	46	72	0.16	0.20	0.57	0.57	0.12	0.57	0.16	0.64
20D (2 chnls)	59	78	0.08	0.26	0.22	0.29	0.25	0.14	0.67	0.05
0 (4 chnls)	60	100	0.06	0.16	0.09	0.28	0.55	0.77	0.64	1.23
20U (3 chnls)	67	134	0.07	0.28	0.22	0.41	0.42	0.34	0.94	0.94
40U (4 chnls)	62.7	85	0.3	0.19	0.19	0.3	0.00	0.49	0.89	0.89
60U (4 chnls)	51.6	100	0.07	0.32	0.37	0.47	0.08	0.27	0.22	0.98

Distance and Direction from Crossing (m)	Stream Morphology Composition (%)						Substrate Composition (%)				
	Riffle	Pool (<0.2 m)	Pool (>0.2 m)	Run	Cascade	Other	Fines	Gravel	Small Cobble	Large Cobble	Boulders
60D	15	40			30	15 rapids		20	30	20	30
40D	40	5	15		40			20	20	40	20
20D	30	10	20		40			15	25	35	25
0	30	20	10		40			5	20	45	30
20U	30	25	10		35			5	20	50	25
40U	30	10	30		30				25	40	35
60U	30	30	10		30				10	60	30

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Fish Habitat Quality – IMPORTANT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-003a
UTM Coordinates: 17 W 597454 7805480

Date/Time Surveyed: 6-Sept-08 /14:19

Fisheries Information

Electrofishing Conducted: Y **Effort (min):** 10:06 **Electrofisher Settings:** 700V, 40Hz, 30%

Species	Total Caught/Observed	CPUE	Length Range (mm)	Weight Range (g)
ARCH	5	0.50	57-128	2-15
NNST	0	-	-	-

Fish Habitat Potential

Species	Spawning	Overwintering	Rearing	Migration Corridor
ARCH	No	No	High	Low
NNST	No	No	Low	No

Comments & Summary

Fished along the right side of the main channel.

Baffinland Iron Mines
Mary River Project



Fish Habitat Quality – IMPORTANT

Rail Alignment Watercourse Crossing Assessment

Location

Crossing ID: AR-003a
UTM Coordinates: 17 W 597454 7805480

Date/Time Surveyed: 6-Sept-08 /14:19

Photographs



A



B



C



D



E



F



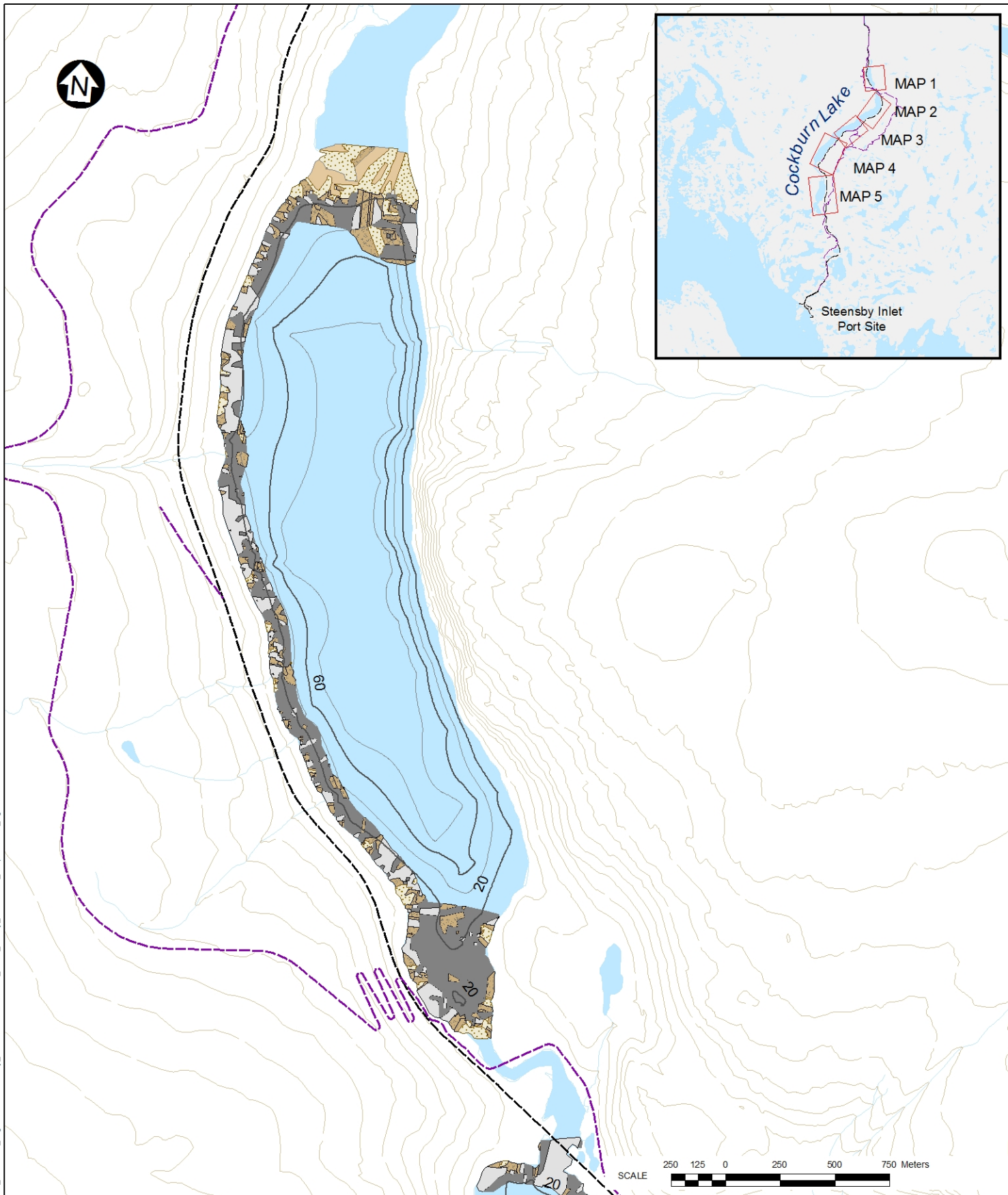
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Figure 1. View of habitat 60 (A), 40 (B), and 20 m (C) downstream of crossing, at the crossing (D), and 20 (E), 40 (F), and 60 m (G) upstream of crossing.

APPENDIX 5.1-4.

**COCKBURN LAKE BATHYMETRY AND SUBSTRATE
MAPPING.**

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LEGEND:

SUBSTRATE

- BOULDER
- COBBLE - CLAY - MIXED
- COBBLE - PEBBLE
- GRAVEL - COARSE SAND
- SAND

BATHYMETRIC CONTOURS

- MAJOR INTERVALS (20, 60, 100, 140 M)
- MINOR INTERVALS (40, 80, 120, 160 M)
- CONTOUR
- RAILWAY CENTERLINE
- CONSTRUCTION ACCESS ROAD

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009). ALL RIGHTS RESERVED.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
3. DEPTHS OF BATHYMETRIC CONTOURS ARE IN METRES AND ARE RELATIVE TO SHORELINE AT TIME OF SURVEY.
4. CONTOUR INTERVAL IS 25 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**Cockburn Lake Northwest Basin
Bathymetry and Substrate
- MAP 1 of 5 -**

REV	DDMMYY10	ISSUED FOR	DESIGNED	DRAWN	CHKD	APP'D
-	-	-	-	-	-	-



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Aquatic Environment Specialists

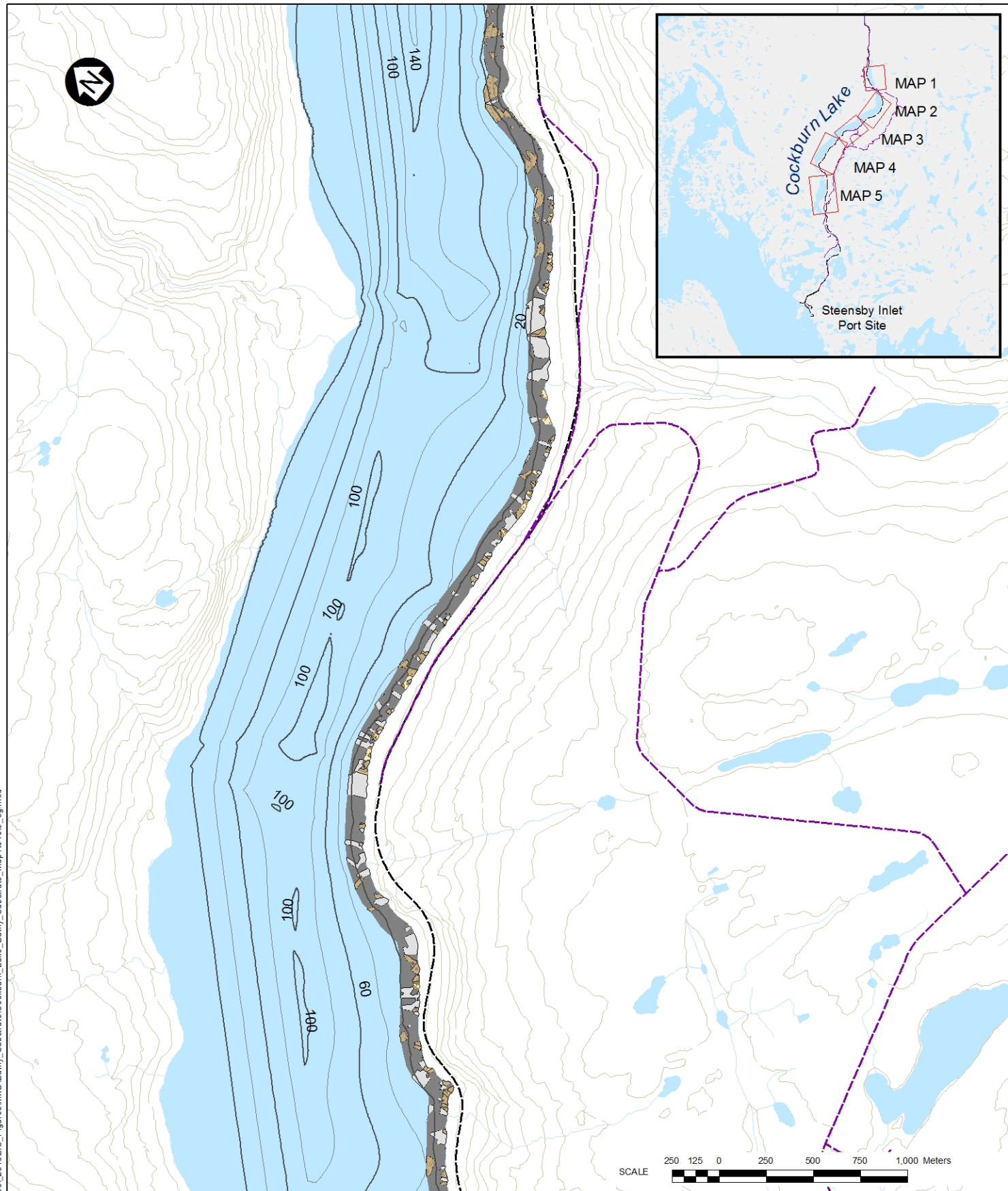
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REF NO.

DATE: 22/10/2010

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LEGEND:

SUBSTRATE

- BOULDER
- COBBLE - CLAY - MIXED
- COBBLE - PEBBLE
- GRAVEL - COARSE SAND
- SAND

BATHYMETRIC CONTOURS

- MAJOR INTERVALS (20, 60, 100, 140 M)
- MINOR INTERVALS (40, 80, 120, 160 M)
- CONTOUR
- RAILWAY CENTERLINE
- CONSTRUCTION ACCESS ROAD

NOTES:

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2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
3. DEPTHS OF BATHYMETRIC CONTOURS ARE IN METRES AND ARE RELATIVE TO SHORELINE AT TIME OF SURVEY.
4. CONTOUR INTERVAL IS 25 M AND IS IN METRES.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

**Cockburn Lake Central Basin
Bathymetry and Substrate
- MAP 3 of 5 -**

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PIA NO.

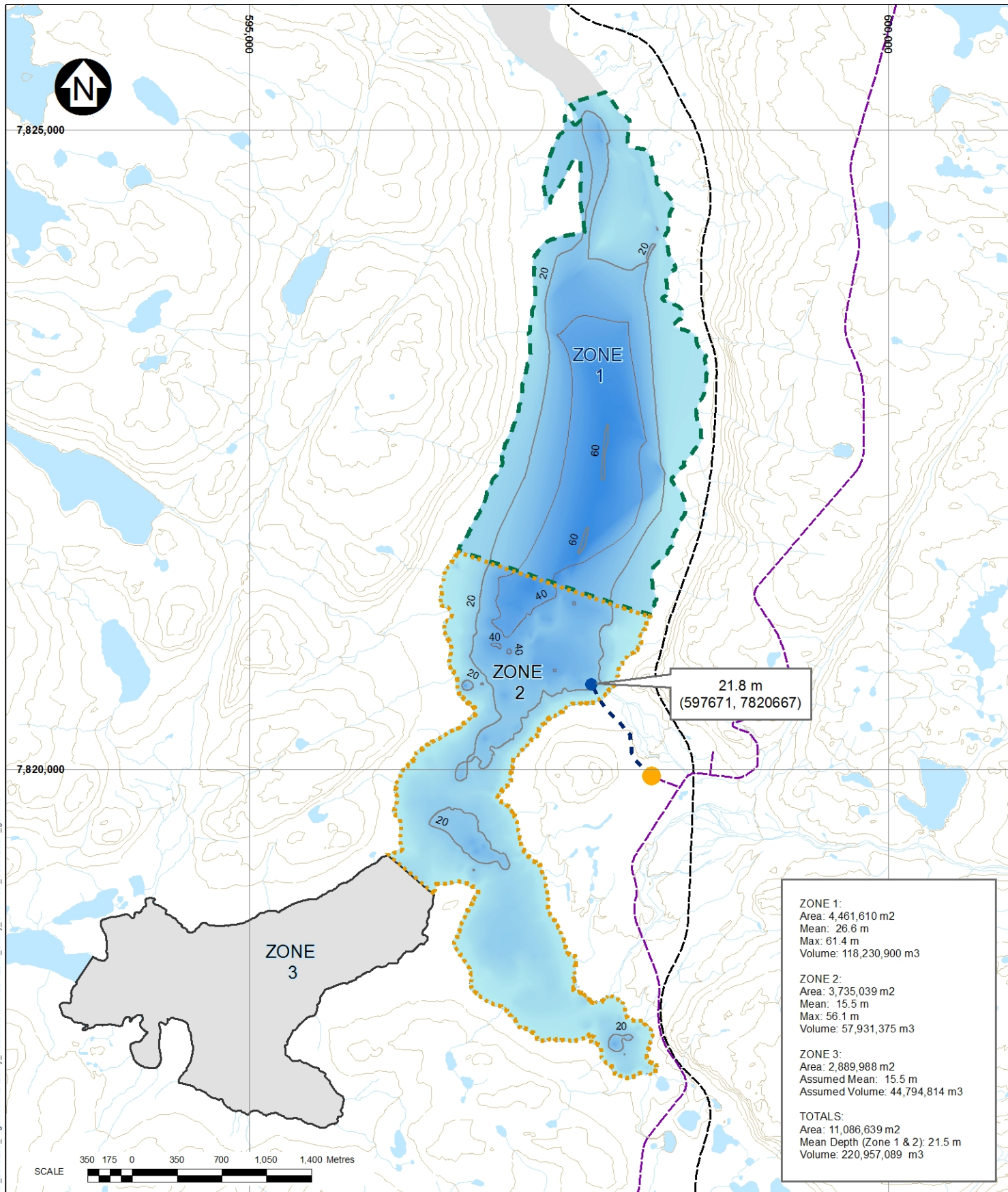
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DATE: 22/10/2010

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REV	DDMMYY10	ISSUED FOR	DESIGNED	DRAWN	CHKD	APP'D
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LEGEND:

- CONTOUR
 - RAILWAY CENTERLINE
 - CONSTRUCTION ACCESS ROAD
 - PROPOSED CONSTRUCTION CAMP
 - PROPOSED WATER INTAKE
- DEPTH
- HIGH : 61.4
- LOW : 0

NOTES:

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3. DEPTHS OF BATHYMETRIC CONTOURS ARE IN METRES AND ARE RELATIVE TO SHORELINE AT TIME OF SURVEY.
4. CONTOUR INTERVAL IS 25 M AND IS IN METRES.

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MARY RIVER PROJECT

Cockburn Lake South Basin
Bathymetry Overview

North/South Consultants Inc.
Aquatic Environment Specialists

PIA NO.

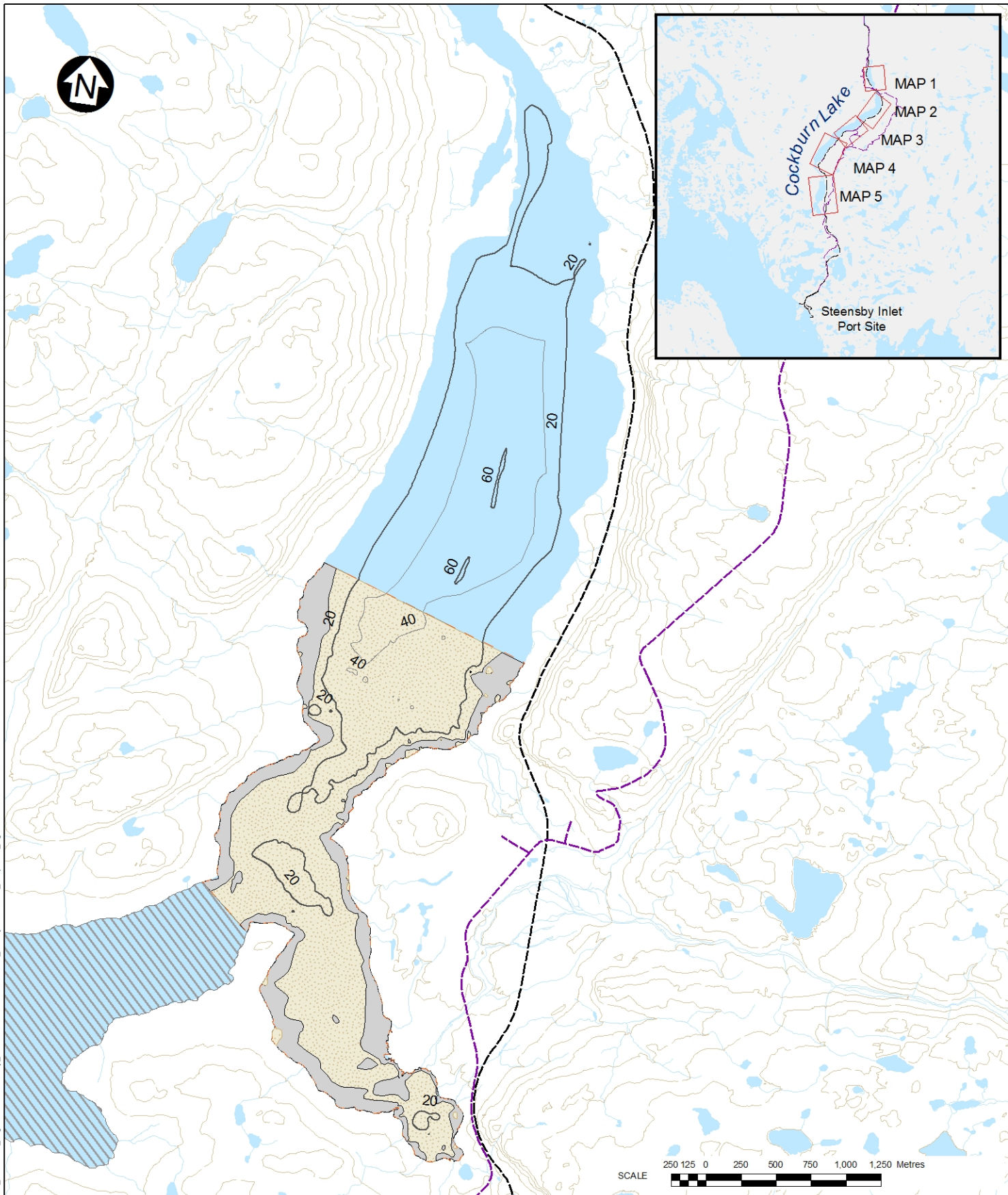
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REV





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


LEGEND:

SUBSTRATE

-  COBBLE/BOULDER WITH POCKETS OF SAND
-  SAND / SILT / CLAY
-  UNSURVEYED
-  2010 SURVEY BOUNDS

BATHYMETRIC CONTOURS

-  MAJOR INTERVALS (20, 60, 100, 140 M)
-  MINOR INTERVALS (40, 80, 120, 160 M)
-  CONTOUR
-  RAILWAY CENTERLINE
-  CONSTRUCTION ACCESS ROAD

NOTES:

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3. DEPTHS OF BATHYMETRIC CONTOURS ARE IN METRES AND ARE RELATIVE TO SHORELINE AT TIME OF SURVEY.
4. CONTOUR INTERVAL IS 25 M AND IS IN METRES.

SCALE 250 125 0 250 500 750 1,000 1,250 Metres

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MARY RIVER PROJECT

**Cockburn Lake South Basin
Bathymetry and Substrate
- MAP 5 of 5 -**

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REF NO.

DATE: 22/10/2010

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