



# **AGNICO EAGLE**

**MEADOWBANK Complex**

## Shipping Management Plan

---

**APRIL 2022**

**VERSION 4**

---

## EXECUTIVE SUMMARY

---

The Shipping Management Plan for the Whale Tail Pit Project (the Project) was developed in accordance with federal legislation, notably the *Canada Shipping Act* and the *Arctic Waters Pollution Prevention Act*, associated regulations. It also recognizes the international conventions and protocols signed by Canada. Agnico Eagle Mines Limited (Agnico Eagle) will provide the necessary human, material, and financial resources to meet or exceed the legal requirements attributable to the company that arise from shipping-related activities. Shipping contractors will be encouraged to do the same. Agnico Eagle and its shipping contractors will carry third party liability insurance.

All shipping will be carried out during the open water season and will follow recommended shipping routes for the annual sealift to Baker Lake and other Kivalliq Region communities. There will not be any ice breaking to extend the shipping season.

Dry cargo multipurpose vessels and fuel tankers will arrive at a lightering point near Helicopter Island where they will anchor approximately 1 kilometer (km) from the island. Dry cargo will be lightered onto tug-assisted barges and fuel will be lightered onto smaller shuttle tankers for transport through the Baker Lake access passage (Chesterfield narrows, south channel) to the Meadowbank Mine barge unloading facilities and laydown area in Baker Lake.

It is Agnico Eagle's intent to prioritize the road transport of hazardous materials, including explosive-related materials, to the Project site to avoid having such cargo remain in storage in Baker Lake. Other contingency measures associated with shipping-related activities include the Project's Spill Contingency Plan, Emergency Response Plan, and Oil Pollution Emergency Plan and Oil Pollution Prevention Plan (OPEP/OPPP). Risk and hazard assessments of shore-based marine response activities will be undertaken as part of training the Emergency Response Team.

Navigation through the Labrador Sea, Hudson Strait, and Hudson Bay is not challenging during the open water season. Navigation through Chesterfield Inlet also does not represent a major risk with exception of two locations; at Deer Island and Target Rock where passages are narrow and have strong currents. No major hazards are identified along the shipping and tug-barge routes under normal conditions.

All ship, tug and tanker Masters will use electronic charts and other electronic navigational aids to provide safety in transit, reduce the risk of accidents, remain within recommended shipping routes and follow their internal navigation charts and guides (e.g., Navigation Arctic Guide) based on their experience. In addition, there are some Project-specific measures concerning navigation in Chesterfield Inlet, including careful assessment of the conditions before entering the inlet, travelling during daytime when possible and good visibility, and making bound-up travel with tidal flood when possible.

Passage through locations with shipping and boating traffic will be coordinated to avoid shipping conflicts, and speed will be reduced where possible to ensure safety. To maximize the safety of the persons travelling in boats near Chesterfield Inlet, Agnico Eagle or the shipping contractor will inform the community of the shipping activities, promote actions that will allow the ship and the small boats to see one another, and, through the Community Liaison Committee, will recommend that all those in small boats wear personal floatation devices.

On board waste management (solid and hazardous wastes, sewage) will be the responsibility of shipping contractors. Agnico Eagle will require the shipping contractors to conform to the *Ballast Management Control and Management Regulations*, which should reduce the risk of invasive species being introduced as a result of shipping activities. Agnico Eagle expects to contract vessels that meet applicable environmental requirements in addition to being reliable and having a superior safety record.

Care will be taken to avoid disturbing marine mammals within the shipping lanes as much as possible and a Marine Mammal and Seabird Observer (MMSO) will be assigned to the ship crew. Ship crew will monitor the shipping lane for marine mammals during transits in Hudson Strait up to the lightering point near Helicopter Island. As in the past, monitoring will continue using Inuit Marine Wildlife Monitoring aboard the vessels between Helicopter Island and Baker Lake, in accordance with NIRB Project Certificate No.004 Condition 36 (NIRB 2006). Mitigation measures may comprise, if safe to do so, slowing the ship and maintaining a safe distance from marine mammals.

Vessels contracted by Agnico Eagle will be required to have an approved Shipboard Oil Pollution Emergency Plan (SOPEP). If an environmental emergency occurs along the shipping routes, the SOPEP will be activated. If needed, close coordination will be maintained with Agnico Eagle's shore-based supervisors who can activate Agnico Eagle's Emergency Response Plan and OPEP to provide assistance to a vessel. Accidents or malfunctions during transit will be reported to Transport Canada. Spills would also be reported to the Environmental Emergencies 24-Hour Report Line and, if necessary, advice would be requested from the Regional Environmental Emergencies Team. Assistance could be sought from nearby ships and the Canadian Coast Guard.

---

**TABLE OF CONTENTS**


---

Executive Summary .....	i
Table of Contents .....	iii
Figures and Tables .....	iv
Document Control .....	v
Acronyms.....	vi
Section 1 • Introduction .....	1
1.1 Shipping Needs .....	1
1.2 Shipping Routes .....	1
1.3 Lightering Procedures.....	2
1.3.1 Dry Cargo .....	2
1.3.2 Diesel Fuel .....	4
1.3.3 Explosives and Hazardous Materials .....	4
Section 2 • Related Documents.....	6
2.1 Spill Contingency Plan .....	6
2.2 Emergency Response Plan.....	6
2.3 Oil Pollution Emergency Plan .....	6
2.4 Shipboard Oil Pollution Emergency Plan .....	7
Section 3 • Applicable Federal Acts, Regulations and Guidelines.....	8
Section 4 • Marine Wildlife .....	11
4.1 Interactions and Potential Effects .....	11
4.2 Mitigation Measures .....	11
4.3 Monitoring and Reporting .....	13
Section 5 • Navigational Safety .....	14
Section 6 • On Board Waste Management .....	15
6.1 Sewage.....	15
6.2 Solid Waste .....	17
Section 7 • Ballast Water Management.....	19
7.1 Ballast Water Exchange .....	20
Section 8 • Safety .....	21

Section 9 • Hazard Identification Analysis of Marine Routes.....	22
Section 10 • Risk Analysis of Marine Routes .....	24
Section 11 • Socio-Economic Impact of Shipping.....	26
Section 12 • Public and Media Communications .....	27
References .....	28
Appendix A • Marine Hydrographic Charts .....	1
Appendix B • Marine Mammal Management and Monitoring Plan .....	8

---

**FIGURES AND TABLES**

---

Figure 1-1 Shipping Route.....	3
Table 3-1 Applicable Acts, Regulation, and Guidelines .....	9
Table 3-2 International Conventions and Protocols Signed by Canada .....	10

## DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	June 2016	All	All	First draft of plan prepared as part of the FEIS submission.	Golder Associates Ltd.
2	April 2018	All	All	Comprehensive review to ensure plan reflects most up to date information and incorporates Project Certificate 008 Conditions.	Agnico Eagle Mines Ltd.
3_NIRB	December 2018	All	All	Shipping Management Plan as Supporting Document submitted to Nunavut Impact Review Board for review and approval as part of Whale Tail Pit – Expansion Project	Agnico Eagle Mines Ltd.
4	April 2022	Executive Summary	i - ii	Removed references to the Whale Tail Pit – Expansion Project	Agnico Eagle Mines Ltd.
		Section 1	1	Introduction updated to remove references to the Whale Tail Pit – Expansion Project	
		Section 6	15 – 18	Addition of information pertaining to the Arctic Shipping Safety and Pollution Prevention Regulations (ASSPPR)	
		References	28	Updated	
		Appendix B		Updated sheets for MMSO added	

---

**ACRONYMS**

---

AWPPA	Arctic Waters Pollution Prevention Act
ASSPPR	Arctic Shipping Safety and Pollution Prevention Regulations
BWMP	Ballast Water Management Plan
CCG	Canadian Coast Guard
ERP	Emergency Response Plan
ERT	Emergency Response Team
FEIS	Final Environmental Impact Statement
IMO	International Marine Organization
MARPOL	International Convention for the Prevention of Pollution from Ships
MLA	Marine Liability Act
MMSO	Marine Mammal and Seabird Observer
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
OPEP	Oil Pollution Emergency Plan
OPEP	Oil Pollution Prevention Plan
REET	Regional Environmental Emergencies Team
SOLAS	International Convention for the Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plan

---

## SECTION 1 • INTRODUCTION

---

Agnico Eagle Mines Limited – Meadowbank Complex (Agnico Eagle) has gained extensive experience in shipping fuel and dry cargo to the Meadowbank Mine since its construction began in 2008 and commercial production in 2010. The extension of the Meadowbank mine through the Whale Tail Pit Project (the Project) utilizes shipping arrangements already in use for the Meadowbank Mine and does not incur a change in shipping procedures (Figure 1-1).

This plan has been updated as per recommendation of Transport Canada to include reference to the Arctic Shipping Safety and Pollution Prevention Regulations. This plan was prepared to comply with the Whale Tail Pit NIRB Project Certificate 008 Condition 37 (NIRB 2018) and Nunavut Water Board (NWB) Type A Water License 2AM-WTP1830. In addition, this Plan will be updated as required to reflect any changes in operation or economic feasibility, and to incorporate new information or the latest technology, as appropriate.

### 1.1 Shipping Needs

A total of approximately 180,000 cubic metres of dry cargo (equipment and supplies) and approximately 95 million liters of diesel fuel will be required annually for the operations of the Project. To meet these needs, a total of three to eight vessels will annually deliver dry goods, and two to three tankers will deliver diesel fuel annually.

All shipping will be carried out during the open water season (typically from July to late October) and will follow recommended shipping routes<sup>1</sup> that are presently in use for the annual sea lift to Chesterfield Inlet, Baker Lake and other communities.

The priorities in shipping dry cargo and fuel will be:

- the protection of the crew and others in small boats that the ship may come across;
- the protection of the marine environment; and
- the preservation of the ship and its cargo.

All ships, tugs, and tankers will be equipped with electronic navigational aids. Ships will not be serviced in Chesterfield Inlet and will arrive with enough fuel for the return voyage south.

### 1.2 Shipping Routes

The marine transport of dry cargo will be comprised of five main segments, all within established shipping lanes:

---

<sup>1</sup> Agnico Eagle's shipping routes within Nunavut are non-compulsory pilotage areas during the ice free shipping season.



- Bécancour, Québec on the St. Lawrence River, along the coast of Labrador to Hudson Strait;
- through Hudson Strait to Hudson Bay (see Appendix A for marine hydrographic charts showing the shipping lanes);
- across Hudson Bay to the mouth of Chesterfield Inlet;
- through Chesterfield Inlet to an anchorage point at Helicopter Island at the head of Chesterfield Inlet; and
- through Chesterfield Narrows to the hamlet of Baker Lake (located on northwest shore of Baker Lake).

Dry cargo will be loaded on multipurpose (MPP) vessels, class: GL + 100 A5 E3 (LOA 138.98 m, draft 8 m, freight capacity ~ 19,000 m<sup>3</sup>) in eastern ports, almost exclusively Bécancour, and delivered directly to the lightering point near Helicopter Island by Nunavut Sealink and Supply Inc. (NSSI). The first vessels of the year will normally arrive in July or early August. As these ships are too large to navigate Chesterfield Narrows (navigational passage between Chesterfield Inlet and Baker Lake), they will anchor near Helicopter Island (Figure 1-1) at the head of Chesterfield Inlet, where the dry cargo will be lightered onto barges for transport to Baker Lake. Up to eight MPP vessels will arrive throughout the open water shipping season delivering dry cargo. All ships will be equipped with complete electronic navigation aids for navigation in restricted waters.

Fuel (diesel (USLD) and Jet A) will be loaded on marine fuel tankers and delivered to the lightering point near Helicopter Island by Woodward Group of Companies. Once the fuel tankers are securely anchored, fuel is transferred to smaller shuttle tankers. The shuttle tankers then transport the fuel shipment through Chesterfield Narrows to the Meadowbank Mine fuel storage area in Baker Lake.

### **1.3 Lightering Procedures**

#### **1.3.1 Dry Cargo**

After dry cargo vessels have anchored at Helicopter Island, dry cargo will be lightered onto barges in preparation for transportation to the Meadowbank barge unloading facilities in Baker Lake. During lightering onto the barges, attention will be directed to ensuring the barges are secured alongside or anchored, with due consideration being given to the prevailing and expected wind, weather, and tide conditions.

The tug-assisted barge used to ferry dry cargo to Baker Lake will be highly maneuverable and capable of transiting the access passage with its changing current patterns. Navigation will proceed at a slow speed in periods of low visibility. Traffic through the access passage will be coordinated through communication between the tugs to avoid shipping conflicts and to ensure safety.

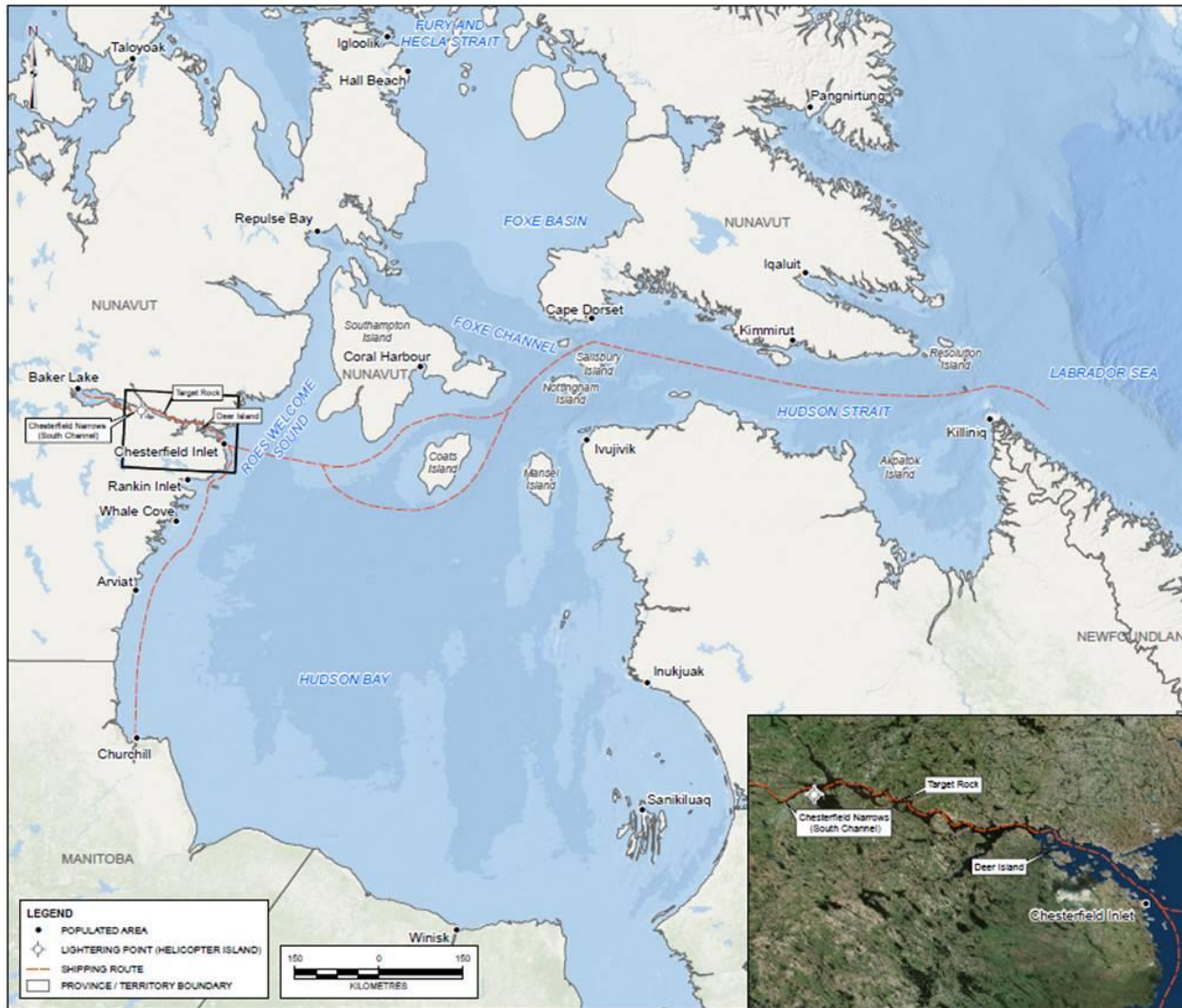


Figure 1-1 Shipping Route

The Master of each vessel (including tugs, barges, large and small tankers, and cargo ships) will be responsible for safe navigation of their vessels between the port of departure and point of destination (Helicopter Island and Baker Lake). For tugs, this also includes responsibility for navigational safety of the barge they are towing or pushing. When a barge is laid alongside a dry cargo vessel for lightering containers or equipment, a loading supervisor on the ship will take charge of the barge.

Outgoing containers, cargo and materials will be loaded on barges in Baker Lake, and then transported to Helicopter Island where it will be loaded onto the cargo ship for the return trip to southern ports. Outgoing cargo could include construction equipment being demobilized following the completion of construction and/or hazardous or other waste being sent to a certified waste management facility for treatment, recycling and/or disposal in another provincial or territorial jurisdiction.

### 1.3.2 Diesel Fuel

It is expected that the large tankers delivering diesel fuel will anchor in the same general location as the dry cargo vessels (i.e., near Helicopter Island; Figure 1-1). Transfer of fuel will occur from the tanker to a smaller shuttle tanker that can navigate the passage between Helicopter Island and Baker Lake. The shuttle tanker will be offloaded at the Meadowbank Mine barge unloading facilities and the fuel will be transported to the Meadowbank and Whale Tail tank farms. Contingency measures related to the transfer of fuel are described in the Oil Pollution Emergency Plan and Oil Pollution Prevention Plan (OPEP/OPPP).

### 1.3.3 Explosives and Hazardous Materials

Explosive management and blasting practices will be consistent with the practices already in place for the Project. Explosives will be stored at the Whale Tail Pit site, where an emulsion storage facility and plant will continue to be used. The existing emulsion plant at the Meadowbank Mine may be maintained with deliveries on an as need basis during operations. The Project will primarily use emulsion-based explosives during construction and operations to minimize the use of ammonium nitrate/fuel oil (ANFO).

It is Agnico Eagle's intent to prioritize the road transport of hazardous materials, including explosive-related materials, to the Project site to avoid having such cargo remain in storage at Baker Lake. Sensitive products such as explosives, boosters and caps will be transported directly to the Project site. However, in the eventuality of a delay in their transit to the mine site, these products will be temporarily stored at the Meadowbank Mine laydown area in Baker Lake according to applicable regulations, which include locked storage under constant surveillance. All handling, transport, storage, manufacture and use of explosives will be subject to federal approval under the *Explosives Act*, and the *Nunavut Mine Health and Safety Act*.

Sodium cyanide is used to optimize gold recovery from the ore. This product will continue to be used at the Project. Due to transportation restrictions, normally a full year's supply of sodium cyanide will be transported and stored on site. The product will be transported, stored, handled, transferred and

used in compliance with appropriate legislation and applicable Best Management Practices. Agnico Eagle is a signatory to the International Cyanide Management Code.

Hazardous waste and contaminated soil will be managed on a yearly basis consistent with the management approach in place for the Project; consequently, there will be little to no accumulation of such wastes at the Project site during operations, subject to seasonal shipping considerations. Hazardous waste will not be incinerated but returned south via a dry-cargo vessel for treatment, recycling and/or disposal in a certified waste management facility. Agnico Eagle will contract shipping companies that are certified under the IMDG code (International Maritime Dangerous Goods).

---

## SECTION 2 • RELATED DOCUMENTS

---

The Shipping Management Plan (the Plan) covers the scope of shipping activities for the Project.

Management and monitoring plans for the Project that provided input to the Shipping Management Plan include the following:

- Spill Contingency Plan;
- Emergency Response Plan;
- Oil Pollution Emergency Plan and Oil Pollution Prevention; and
- Shipboard Oil Pollution Emergency Plan (shipping companies).

### 2.1 Spill Contingency Plan

The cornerstone of spill contingency planning for Agnico Eagle is the Spill Contingency Plan covering all spills on land, water, and ice. The Spill Contingency Plan, coupled with the Emergency Response Plan, describes the processes to be followed when responding to a spill to the environment.

### 2.2 Emergency Response Plan

The Emergency Response Plan (ERP) focuses on responding to all emergencies in a timely and adequate manner. It commits Agnico Eagle to being prepared for and providing adequate resources - qualified personnel and equipment - to handle a wide variety of emergency situations.

Risk and hazard assessments of shore-based marine response activities will be undertaken as part of training for the Agnico Eagle Emergency Response Team (ERT).

### 2.3 Oil Pollution Emergency Plan

The Oil Pollution Emergency Plan and Oil Pollution Prevention Plan complements the Spill Contingency Plan and should not be construed as superseding it. The OPEP/OPPP only provides contingency planning for storage of hydrocarbon products at the Meadowbank Mine laydown area in Baker Lake.

The OPEP/OPPP complies with the requirements for procedures, equipment and resources as set out in the *Canada Shipping Act* (s.s. 660.2(4)) specific to the fuel handling facility, the bulk incoming transfer of fuel from ship-to-shore and spill scenarios directly relating to this operation. Further, the OPEP/OPPP provides direction to Agnico Eagle personnel and/or contractors, and to Agnico Eagle's ERT in emergency spill response situations. It also contributes in developing oil pollution scenarios, defining the roles and responsibilities of management and responders, and outlining the measures taken to prevent spills. The OPEP/OPPP seeks to minimize potential health and safety hazards, environmental damage, and cleanup costs.

Spills resulting from ship-to-ship fuel transfer will be the responsibility of the shipping companies contracted by Agnico Eagle and the vessel's Master. Agnico Eagle will provide assistance wherever possible in the event of a spill in these instances.

## 2.4 Shipboard Oil Pollution Emergency Plan

The Shipboard Oil Pollution Emergency Plan (SOPEP) will contain all information and operational instructions as required by the International Marine Organization's *"Guidelines for the Development of the Shipboard Marine Pollution Emergency Plan"*. Vessels contracted by Agnico Eagle will be required to have an approved SOPEP. The preparation of the SOPEP is the responsibility of the shipping company and is maintained by the vessel's Master. However, close coordination will be maintained with Agnico Eagle's shore-based supervisors who can activate the ERP and OPEP in providing assistance to a vessel in the near-shore area. These two plans will have close links to the SOPEP and, as required, will include training exercises at regular intervals to ensure ship and shore can cooperate in responding to any spill of fuel or any other hazardous product. Shipboard Oil Pollution Emergency Plans will be required to include how vessel contractor(s) will maintain spill equipment, and the frequency and framework for training vessel personnel in vessel-based spill response. This may include, but not be limited to:

- spill equipment audits;
- maintaining posted list of spill equipment;
- requirements for spill response drills; and
- on-going training refreshers (e.g., annual renewals).

Accidents or malfunctions during transit will be reported to Transport Canada. If the accident involves the loss of fuel or chemicals, the SOPEP would be activated and on-board spill response materials and equipment put to use. Spills would also be reported to the Government of Nunavut Spill Line and to the Environmental Emergencies 24-Hour Report Line and, if necessary, advice would be requested from the Regional Environmental Emergencies Team. Assistance could be sought from nearby ships and the Canadian Coast Guard (CCG). Spill response resources such as those maintained by the CCG at select locations along the Kivalliq Region coast could be dispatched to the spill site.

Outside help could be requested for major accidents such as accidental grounding/stranding of a vessel. Under these circumstances, the safety of the crew and maintaining the integrity of the vessel would be the first priority.

---

**SECTION 3 • APPLICABLE FEDERAL ACTS, REGULATIONS AND GUIDELINES**

---

The Shipping Management Plan was prepared in accordance with federal legislation outlined in Table 3-1. Numerous regulations exist under the *Canada Shipping Act* and these can be found at [www.tc.gc.ca](http://www.tc.gc.ca). The regulations included here are most relevant to the environment and the Plan.

Table 3-2 lists international conventions and protocols signed by Canada. Canada is a signatory to International Maritime Organization (IMO) International Convention for the Prevention of Pollution from Ships (MARPOL) and International Convention for the Safety of Life at Sea (SOLAS). As such, Canadian marine laws, regulations and guidelines rules are a reflection of these international conventions, protocols and agreements.

At this time, Agnico Eagle has contracted NSSI and Woodward Group of Companies to be used in Project shipping to Baker Lake. However, the shipping companies could change over the construction, operations and closure phases of the Project. It is required that the shipping contractors to be used by Agnico Eagle abide by Canadian laws and regulations, applicable MARPOL 73/70 annexes, and international conventions. This is also a requirement of NIRB Project Certificate 008 Condition 43. Inspections carried by federal inspectors will ensure that all applicable statutes are followed. This could include the review of required plans (SOPEP), an audit of the emergency response equipment carried by the vessel, and the means to prevent the discharge of any oil, oily water or other hazardous waste in Arctic waters.

All vessels transiting through and operating in Canadian Arctic waters are required to comply with the *Arctic Waters Pollution Prevention Act (AWPPA)*, the *Canada Shipping Act 2001 (CSA 2001)*, the *Marine Liability Act (MLA)* and their associated regulations, including requirements for vessel construction and operations (see Table 3-1). While the provisions of the CSA 2001 apply in all Canadian waters, vessels in Arctic waters north of 60°N and out to the 200 nautical mile limit of Canada's Exclusive Economic Zone are also subject to the provisions of the AWPPA. The AWPPA prohibits discharges of oil, chemicals, garbage and other wastes generated onboard vessels. It does allow for the discharge of untreated sewage<sup>2</sup>. The MLA sets out a regime that requires vessels operating in Canadian jurisdiction, including Arctic waters, to carry insurance to pay for damages from oil spills.

Two vessel control systems are established under the *Arctic Shipping Pollution Prevention Regulations* – the Zone/Date System and the Arctic Ice Regime Shipping System, which provide for operational safety by taking into account the vessel's capability to operate safely by virtue of ice strengthening, and the ice conditions it will encounter<sup>3</sup>.

---

<sup>2</sup> Ships are to only discharge gray water and treated sewage when the ship is at least 50 km from Chesterfield Inlet.

<sup>3</sup> Agnico Eagle will only ship dry goods and fuel during the open water season.

Vessels servicing the Project will be required to comply with the AWPPA and regulations while in a Shipping Safety Control Zone.

The various shipping companies contracted by Agnico Eagle must have an approved SOPEP, and verify that equipment and operating procedures are consistent with Canadian Marine laws, regulations and guidelines, and with IMO agreements to which Canada is a signatory. It is the responsibility of the Master of the ship to ensure safe passage through Canadian waters and to maintain up-to-date charts and publications<sup>4</sup>.

Agnico Eagle will provide the necessary human, material, and financial resources to meet or exceed the legal requirements attributable to the company that arise from shipping. Shipping contractors will be encouraged to do the same.

*Table 3-1 Applicable Acts, Regulation, and Guidelines*

<b>Acts</b>	<b>Regulations</b>	<b>Guidelines</b>
<i>Canada Shipping Act, 2001 (S.C. 2001, c. 26) [An Oil Pollution Emergency Plan is required under the Act (168(1)d)]</i>	<i>Response Organizations and Oil Handling Facilities Regulations (SOR/95-405) Pollutant Discharge Reporting Regulations, 1995 (SOR/95-351) Environmental Response Arrangements Regulations (SOR/2008-275) Ballast Water Control and Management Regulations (SOR/2006-129) Vessel Pollution and Dangerous Chemicals Regulations</i>	Environmental Prevention and Response National Preparedness Plan 2008 – TP13585 Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants – TP9834E 2009 Arctic Waters Oil Transfer Guidelines, 1997 - TP10783E Response Organizations Standards – TP 14909E Guidelines for the Control of Ballast Water Discharge from Ships in Waters under Canadian Jurisdiction (TP 13617)
<i>Canadian Transportation Accident Investigation and Safety Board Act (S.C. 1989, c. 3)</i>	<i>Transportation Safety Board Regulations (SOR/92-446)</i>	
<i>Marine Liability Act (S.C. 2001, c. 6)</i>	<i>Marine Liability Regulations (SOR/2002-307)</i>	
<i>Arctic Waters Pollution Prevention Act (R.S.C., 1985, c. A-12)</i>	<i>Arctic Waters Pollution Prevention Regulations (C.R.C., c. 354) Arctic Shipping Pollution Prevention Regulations (C.R.C., c. 353)</i>	
<i>Transportation of Dangerous Goods Act (1992, c.34)</i>	<i>Transportation of Dangerous Goods Regulations (SOR/2001-286)</i>	

<sup>4</sup> Transport Canada is not the source to provide up-to-date information on changing sea levels or on emergence of new reefs or shoals.



Acts	Regulations	Guidelines
<i>Safe Containers Convention Act</i> (R.C.C. 1985, c. S-1)		
<i>Oceans Act</i> (S.C. 1996, c. 31)		
<i>Navigable Waters Protection Act</i> (R.S. 1985 c. N-22)		
<i>Canada Water Act</i> (1985 c.11)		
<i>Fisheries Act</i> (R.S.C. c. F-14)	<i>Marine Mammal Regulations</i> (SOR/93-56) <i>Marine Mammal Regulations</i> (SOR/93-56)	
<i>Species at Risk Act</i> (2002 c.29)		Species at Risk Policies
<i>Canadian Environmental Protection Act</i> (1999 c.33)	<i>Environmental Emergency Regulations</i> (SOR/2003-307) <i>Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations</i> (SOR/2002-301) <i>Release and Environmental Emergency Notification Regulations</i> <i>Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations</i> (SOR/2008-197)	

Table 3-2 International Conventions and Protocols Signed by Canada

Conventions	
International Convention for the Prevention of Pollution from Ships MARPOL 73/78 Annexes	
	Objective of Annex is to Prevent Pollution from:
Annex 1	Oil from ships
Annex 2	Noxious liquid substances carried in bulk
Annex 3	Harmful substances carried by ships in packaged form
Annex 4	Sewage treatment and disposal
Annex 5	Garbage handling
Annex 6	Air Pollution from Ships
International Maritime Dangerous Goods Code	
International Convention for the Safety of Life at Sea, 1974, SOLAS 74	

---

**SECTION 4 • MARINE WILDLIFE**

---

Marine mammals have been the basis of the Inuit economy for over 4,000 years. They provide meat, fat, oil, leather, tools and materials for fabrication of arts and crafts. The top layers of the skin yield "muktuk", which is still highly prized as a food rich in vitamin C and high in energy content. (*Fisheries and Oceans Canada* <http://www.dfo-mpo.gc.ca/Science/publications/uww-msm/articles/beluga-eng.htm>)

The reaction of marine wildlife to vessel traffic is predicted to not be significant and, providing mitigation measures are employed, marine vessel traffic associated with the Project should not lead to any residual effects to marine wildlife (refer to the FEIS Addendum: Whale Tail Pit – Expansion Project, Volume 3, Appendix 3-A). Agnico Eagle will include in its contracts that ships must remain mindful of marine areas having a high density of marine mammals and birds. Agnico Eagle request ships provide their ship track data for inclusion in annual reporting.

**4.1 Interactions and Potential Effects**

Vessel discharges (sewage, solid wastes, ballast water), the sight of the vessels and their movement, vessel noise, as well as accidental spills and releases have the potential to interact with and disturb marine wildlife and affect life cycle activities. Possible interactions between shipping and marine wildlife can have the following potential effects:

- marine mammals may retreat to the water should a vessel pass too close to an island or reef where they have pulled themselves out of the water;
- the foraging of marine birds and mammals may be interrupted when vessels approach and pass them in the shipping lanes;
- the improper treatment and release of ballast water, grey water and bilge water could alter the water quality and contaminate the food supply;
- mammal mortalities may result from collisions with the ship; and
- fuel and/or oil spills could result in mortalities and, for marine birds, could lead to the loss of foraging and brood rearing habitat.

**4.2 Mitigation Measures**

As part of shipping companies' standard operating procedures, ship crews will monitor for marine mammals from Hudson Strait to the lightering point near Helicopter Island. Since 2010, the Meadowbank division has implemented a vessel-based Marine Mammal and Seabird Observer (MMSO) program, which will continue to be implemented during all routine project-shipping activities along the shipping route, in accordance with Meadowbank Mine NIRB Project Certificate No. 004 Condition 36 (NIRB 2006). The ship's Master will be notified if there is a concern of the ship striking a

marine mammal. Ship personnel will make a decision if actions are required to avoid a possible collision. This may include, if safe to do so, slowing the ship until the animal has travelled clear of the ship's course. Subject to vessel and human safety considerations, ship personnel shall take every precaution to avoid disturbance, harassment, injury or mortality of marine wildlife by implementation of the following mitigation measures:

- adherence to monitoring requirements as outlined in the vessel-based MMSO program (Appendix B);
- ships will, when possible, maintain a straight course and constant speed, and avoid erratic behaviour;
- use a routing south of Coats Island as the primary shipping route (Figure 1-1)<sup>5</sup>;
- marine mammals will be given right of way as safe navigation allows; under no circumstances, other than in the case of an emergency, will ships approach within 300 m of a walrus or polar bear observed on sea ice<sup>6</sup>;
- ships will maintain a setback distance of at least 500 meters from colonies and aggregations of seabirds and marine mammals during Project shipping transiting through Hudson Strait, Hudson Bay, and Chesterfield Inlet<sup>7</sup>;
- if marine mammals approach within 500 m of a ship, the vessel will reduce its speed and, if possible, cautiously move away from the animal;
- if it is not possible for the ship to move away from or detour around a stationary marine mammal or group of marine mammals, the ship will reduce its speed and wait until the animal(s) move to the side and remain at least 500 m from the ship prior to resuming speed;
- when marine mammals appear to be trapped or disturbed by ship movements, the ship will implement appropriate measures to mitigate disturbance, including stoppage of movement until the marine mammal has moved away from the immediate area;
- the ship will not be operated in such a way as to separate an individual member(s) of a group of marine mammals from other members of the group;
- when weather conditions require, such as when visibility decreases, the ship will adjust its speed accordingly to avoid the likelihood of the ship striking an animal;
- barge-tug or shipping vessels would only travel through the near shore islands and reefs when there is good visibility or adjust their speed according to the conditions;
- monitoring and reporting procedures for ship-bird collisions will be implemented, and any incidents of bird mortalities associated with ship operations will be recorded and reported to Environment and Climate Change Canada (Canadian Wildlife Services);
- ballast water will only be released in designated areas and if there is no marine wildlife in the area; and

---

5 In accordance with Condition 38 of NIRB Project Certificate 008

6 As all shipping will occur during the open water season, collision with young seals in liars will not happen.

7 In accordance with Condition 39 of NIRB Project Certificate 008

- bilge water, grey water and sewage will be properly treated and only released in areas where no marine wildlife is present.

Marine wildlife could be negatively affected by coming in contact with any petroleum product spilled from ships in transit. In the event of a spill, the ship personnel will discourage marine wildlife from coming in contact with the spilled material. The product most likely to be spilled from Project related shipping would be diesel fuel, which floats on the water surface and has a high rate of evaporation. However, these occurrences are expected to be rare and the activation of the SOPEP would significantly reduce their impact. Preventive and contingency measures already in place substantially reduce the risk to marine wildlife from spills.

Adaptive management will allow mitigation measures to be modified in response to new information arising from monitoring carried out by the vessel crews and from traditional knowledge.

### **4.3 Monitoring and Reporting**

As in the past, monitoring will continue using Inuit Marine Wildlife Monitoring aboard the vessels between Helicopter Island and Baker Lake, in accordance with Meadowbank Mine NIRB Project Certificate 004 Condition 36 and Whale Tail Pit NIRB Project Certificate 008 Condition 42. In addition, as per Condition 40 of Project Certificate 008, a vessel-based MMSO program will be implemented during all Project routine shipping activities in the shipping route. This program, described in further detail in Appendix B, will be executed by assigned observers stationed on-board Project vessel(s). Agnico Eagle will continue to report the observations annually to the Nunavut Impact Review Board (NIRB).

---

**SECTION 5 • NAVIGATIONAL SAFETY**

---

The most likely areas where interactions may occur between small boats and barges-tugs and/or ships or vessels are:

1. Chesterfield Inlet;
2. the passage between Chesterfield Inlet and Baker Lake; and
3. where the ship is transiting through the near shore islands and reefs offshore of Chesterfield Inlet.

Mitigation measures to safeguard the safety of those in small boats will include the following:

- Agnico Eagle and/or the shipping operator will consult with the community members mooring or beaching their boats in Chesterfield Inlet regarding scheduled ship transits throughout the Regional Study Area, including Hudson Bay and Chesterfield Inlet<sup>8</sup>; protocols will be developed to minimize the interaction between barge-tug or ship and small boats;
- vessels would only travel through the near shore islands and reefs when there is good visibility or adjust their speed according to the conditions, which would allow the ship and the small boats to be in visual contact;
- vessels will restrict themselves to the recommended shipping routes thereby not surprising any small boat travelling outside the shipping lanes; and
- vessels will sound its horn if a small boat seems unaware of its presence and hasn't responded to communication attempts.

---

<sup>8</sup> In accordance with Condition 41 of NIRB Project Certificate 008

---

**SECTION 6 • ON BOARD WASTE MANAGEMENT**

---

The six annexes of MARPOL promote the elimination of deliberate, negligent or accidental discharge of ship-source pollutants into the marine environment (see also Transport Canada 2009). The list of harmful ship-source discharges includes: oil, noxious liquid substances and dangerous chemicals, sewage, garbage and air pollution. Canadian laws and regulations mirror the MARPOL annexes and conventions. The Arctic Shipping Safety and Pollution Prevention Regulations (ASSPPR), developed under the CSA 2001 and Arctic Waters Pollution Prevention Act, incorporates the International Code for Ships Operating in Polar Waters with the addition of specific Canadian modifications designed to provide clarity on discharge requirements for the prevention of pollution by oil, sewage, and garbage from vessels, as well as the control of pollution by noxious liquid substances in bulk. The pollution prevention sections of the ASSPPR apply to all Canadian vessels operating in polar waters and it is the vessel's responsibility to be in compliance with the regulation. The primary objectives of the Regulations are to (Transport Canada, 2018):

- Introduce a new safety and pollution prevention requirements through the application of the Polar Code to certain Canadian flagged vessels operating in Polar Regions
- Ensure the continuation of existing levels of safety and pollution prevention currently applicable to certain vessels operating within the Canadian Arctic (e.g. complete prohibition of most discharges); and
- Modernize existing elements of the safety and pollution prevention regime for certain vessels operating in the Canadian Arctic and for Canadian flagged vessels operating in the Polar Regions

Agnico Eagle will contract vessels that meet applicable environmental requirements in addition to being reliable and having a superior safety record.

**6.1 Sewage**

Vessels are to have an approved sewage treatment plant meeting Canadian standards<sup>9</sup>. Holding tanks with the capacity for all grey and treated sewage while in port are expected to be part of the ship's infrastructure. The ASSPPR states a Canadian vessel of a gross tonnage of 400 or more of a Canadian vessel that is certified to carry more than 15 persons – must not discharge sewage in polar waters other than arctic waters, unless the discharge is made in accordance with the below conditions:

- a) when the sewage is comminuted and disinfected, the deposit is made in accordance with regulation 11.1.1 of Annex IV to MARPOL and the vessel is located at a distance of at least

---

<sup>9</sup> If all sewage is to be incinerated, there will not be any need for sewage treatment.

three nautical miles from an ice-shelf or fast ice, and is as far as practicable from areas of ice concentrations exceeding 1/10;

b) when the sewage is not comminuted or disinfected, the deposit is made in accordance with regulation 11.1.1 of Annex IV to MARPOL and the vessel is located at a distance of at least 12 nautical miles from an ice-shelf or fast ice, and is as far as practicable from areas of ice concentration exceeding 1/10; or

c) when the vessel operates a sewage treatment plant of an approved type, the deposit is made in accordance with regulation 11.1.2 of Annex IV to MARPOL and the vessel is as far as practicable from the nearest land, ice-shelf, fast ice or areas of ice concentration exceeding 1/10.

A vessel of a gross tonnage of more than 15 and less than 400 and that is not certified to carry more than 15 persons — or a person on board such a vessel — may deposit sewage if:

a) the sewage is comminuted and disinfected using a marine sanitation device that meets the requirements of section 90 of the Vessel Pollution and Dangerous Chemicals Regulations and the deposit is made at a distance of at least one nautical mile from shore, an ice-shelf or fast ice, and is as far as practicable from areas of ice concentrations exceeding 1/10;

(b) the deposit is made while the vessel is en route at the fastest feasible speed, at a distance of at least three nautical miles from shore, an ice-shelf or fast ice, and is as far as practicable from areas of ice concentration exceeding 1/10; or

(c) the requirements of paragraph (b) cannot be met because the distance between any shore, ice-shelf or fast ice is less than six nautical miles, and the deposit is made while the vessel is en route at a speed of at least four knots, or if the deposit is not feasible at this speed, the deposit is made

(i) during an ebb tide, while the vessel is en route, at the fastest feasible speed into the deepest waters that are located the farthest from shore, or

(ii) while the vessel is en route at the fastest feasible speed and into the deepest and fastest moving waters that are located the farthest from shore.

In adherence to the ASSPPR regulations, Agnico Eagle will advise ships that disposal of wastewater into the environment is to be avoided within 50 km of Chesterfield Inlet.

Sewage sludge from the sewage treatment plant can be incinerated in the on-board incinerator.

## 6.2 Solid Waste

If deemed necessary by the carrier, solid waste materials are to be incinerated on board, disposed of in an approved landfill or shipped south for safe disposal to a certified waste management facility. No solid waste materials will be disposed of in the marine environment.

As per the ASSPPR, operations in polar waters must be taken into account in the Garbage Record Book, the garbage management plan, and the placards as required by the Vessel Pollution and Dangerous Chemicals Regulations. It is the vessel's responsibility to ensure that the regulation is being followed.

For the purposes of subsection 4(1) of the Arctic Waters Pollution Prevention Act, waste may be deposited if:

- (a) the deposit is necessary for the purpose of saving a life, securing the safety of a vessel or preventing the immediate loss of a vessel;
- (b) the deposit occurs as a result of an accident of navigation in which a vessel or its equipment is damaged, unless the accident occurs as a result of an action that is outside the ordinary practice of seafarers;
- (c) in the case of oil, the deposit is a minimal and unavoidable leakage that occurs as a result of the operation of an underwater machinery component;
- (d) in the case of fishing gear, the deposit is an accidental loss and all reasonable precautions were taken to prevent such a loss;
- (e) in the case of fishing gear, the deposit is for the protection of the marine environment or for the safety of that vessel or its crew; or
- (f) in the case of garbage, the deposit is the result of damage to a vessel or its equipment, when all reasonable precautions were taken before the occurrence to prevent and minimize the deposit, and after the occurrence to minimize it

The design and operation of shipboard incinerators in Canada are specified under the International Marine Organization, Marine Environmental Pollution Committee 76 (40), Annex V. Standard specifications for shipboard incinerators allow for the incineration of solid wastes approximating in composition to household waste and liquid wastes arising from the operation of the ship, e.g., domestic waste, cargo-associated waste, maintenance waste, operational waste, cargo residues, and fishing gear. Operating temperatures are similar to those for the incinerator at the Project, and flue gases are cooled rapidly to limit the *in vivo* formation of dioxins.



Tugs will remain in Baker Lake for the duration of the shipping season. Their waste will be incinerated with the ash stored in containers, which will be shipped south at the end of the shipping season for treatment, recycling and/or disposal in a certified waste management facility.

Hazardous waste will not be incinerated but returned south for treatment, recycling and/or disposal in a certified waste management facility.

---

**SECTION 7 • BALLAST WATER MANAGEMENT**

---

Ballast water is essential to control trim, list, draught, stability, and/or stresses on a vessel. Ballast water control and management regulations protect waters under Canadian jurisdiction from non-indigenous aquatic organisms and pathogens that can be harmful to ecosystems. The *Ballast Management Control and Management Regulations* are intended to minimize the probability of introduction of harmful aquatic organisms and pathogens from vessels' ballast water while also protecting the safety of vessels (Transport Canada 2007).

While an exemption exists in the regulations for vessels operating exclusively in waters under Canadian jurisdiction or certain adjacent waters, any Canadian vessel that has operated outside these waters may carry harmful aquatic organisms or pathogens in their residual ballast and, as such, is not eligible to exemption.

Agnico Eagle expects to use vessels largely active in the coastal trade that operate almost exclusively in waters under Canadian jurisdiction. However, these vessels do on occasion venture into waters outside Canadian jurisdiction and, as such, will require a Ballast Water Management Plan (BWMP). The regulations require the preparation and carriage of a BWMP for each vessel, and for copies to be submitted to Transport Canada. The BWMP will be specific to the vessel and will be a requirement of the carrier.

If Agnico Eagle were to contract vessels originating from waters outside the jurisdiction of Canada, a BWMP would be required. All BWMP (reviewed by the National Administration) carried on ships of foreign origin would be based on the following international guidelines and guiding principles:

- IMO Resolution A.868(20): *Guidelines for the Control and Management of Ships Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens*, in particular Section 7.1;
- The *Model Ballast Water Management Plan* developed by the International Chamber of Shipping and the International Association of Independent Tanker Owners;
- Regulation B-1 of the IMO's *Regulations for the Control and Management of Ships' Ballast Water and Sediments*; and
- Part B of the Annex to Resolution MEPC.127 (53): *Guidelines for Ballast Water Management and Development of Ballast Water Management Plans*.

Agnico Eagle will require contracted vessels not eligible for exemption to provide Agnico Eagle with a copy of their BWMP.

## 7.1 Ballast Water Exchange

It is recognized by the IMO that the exchange of ballast water in deep ocean areas or open seas offers a means of limiting the probability of harmful aquatic organisms and pathogens being transferred to the marine environment via vessel ballast water. If it is necessary to take on and discharge ballast water in the same port to facilitate safe cargo operations, care will be taken to avoid unnecessary discharge of ballast water that has been taken up in another port as this could introduce harmful aquatic organisms. In particular, sediment found in the vessel's ballast tanks should be disposed of at sea in areas outside 200 nautical miles (370 km) from land and in water depths exceeding 2,000 m.

Vessels take on ballast water in segregated chambers for the main purpose of stabilizing the vessels by adding the weight of the water and maintaining a specified draught. Vessels laden with dry cargo or fuel will take on less ballast water than empty vessels. As all ships on the inward voyage to Chesterfield Inlet will be laden, they will have a minimum of ballast water. However, on the outward journey, these vessels will take on ballast water.

In the event that a ship is contracted from waters outside jurisdiction of Canada, ballast exchange is to occur at least 200 nautical miles from shore where the water is at least 2,000 m deep. If the foreign vessel undertakes this ballast exchange outside Canadian waters, it can undertake further ballast water exchanges within Canadian waters. If safety or other reasons dictate that the ballast exchange cannot occur outside waters under Canadian jurisdiction, an alternate designated area is available in Hudson Strait, east of 70° west longitude, where the water is over 300 m deep.

In the case of non-transoceanic navigation, and where ballast water is taken on-board outside waters of Canadian jurisdiction, the water is to be exchanged before entering Canadian waters at a location at least 50 nautical miles offshore, in water at least 500 m deep. If this is not possible due to safety or other reasons, the ballast water exchange can occur in the alternate designated area in Hudson Strait, east of 70° west longitude, where the water is over 300 m deep.

All coastal trade vessels will in all likelihood not venture more than 200 nautical miles from shore and will not exchange ballast water outside waters of Canadian jurisdiction. All the same, ballast water exchanges for all vessels operating in waters under Canadian jurisdiction are expected to meet the provisions of the Regulations, and to follow Part A of the IMO *Guidelines for Ballast Water Management and Development of Ballast Water Management Plans*, and the IMO *Guidelines for Ballast Water Exchange*.

---

**SECTION 8 • SAFETY**

---

Safety is a top priority for Agnico Eagle. It begins with all personnel (Agnico Eagle, contracted employees and contractors) wearing the appropriate personal protection equipment suitable for the task at hand and for the weather conditions at the time. Secondly, personnel must understand the hazards associated with the task, the safe procedures in carrying it out, and how not to place oneself in harm's way. Accident prevention will be supported by a proactive program to identify and correct potential hazards before an accident occurs.

Agnico Eagle or contracted supervisors will ensure that the interactions between ship and shore are carried out with the safety and the health of the employees first in mind.

---

**SECTION 9 • HAZARD IDENTIFICATION ANALYSIS OF MARINE ROUTES**

---

**Hazard:** Anything that has the potential to cause harm.

**Likelihood:** The probability/chance of harm occurring as a result of exposure to a hazard.

**Severity:** The level of harm that may occur as a result of exposure to or contact with a hazard.

**Risk:** The likelihood of harm occurring combined with the potential severity to produce a level of risk or risk rating.

Navigation through the Labrador Sea, Hudson Strait and Hudson Bay is not challenging during the open water season. Navigation through Chesterfield Inlet also does not represent a major risk with the exception of two locations; at Deer Island and Target Rock where passages are narrow and have strong current. No major hazards were identified along the shipping and tug-barge routes under normal conditions. Electronic charts combined with electronic navigation aids for the recommended shipping routes ensure the vessel remains on course where bathymetry and physical hazards are known.

Subject to ship and human safety considerations, the average speed of the vessels in open waters is expected to be less than 14 knots (26 km/h). Shipping can be carried out without pilotage as the shipping lanes entail minor hazards that do not significantly reduce ship safety. Any actions required by the crews of the ships and tugs are expected to be well within their capabilities.

At the anchor point, cargo will be lightered from the ships onto barges and be delivered to Meadowbank Mine barge unloading facilities in Baker Lake via the access passage (Chesterfield Narrows). The tugs-barges will be highly maneuverable and capable of transiting the access passage with its changing currents and will not require pilotage. Navigation will proceed with extra caution in periods of low visibility. Traffic through the access passage will be coordinated to avoid shipping conflicts and to ensure safety.

However, the following out of the ordinary events have been identified that could increase the level of hazard and necessitate associated mitigation measures:

- mechanical failure occurring on the ship or tug thereby placing it in jeopardy in the shipping lane;
- vessel running aground due to a navigational error or mechanical failure;
- loss or damage to sea cans in heavy seas;
- barge tow line breaking in heavy seas;

- collision of a vessel carrying dry cargo and fuel to Baker Lake through the access passage;
- vessel sinking upon hitting ice; and
- vessel colliding with a small boat.

The access passage between Chesterfield Inlet and Baker Lake deserves special attention as it contains a series of narrow passages and, although two-way traffic is theoretically possible, it raises the risk of collisions and groundings.

---

**SECTION 10 • RISK ANALYSIS OF MARINE ROUTES**

---

All ships, tugs, and tankers use electronic charts and other electronic navigational aids to provide safety in transit, reduce the risk of accidents, and remain within recommended sea routes. Also, shipping companies likely to be employed by Agnico Eagle commonly sail in Hudson Bay and to Chesterfield Inlet, are aware of its marine hazards, and have their own navigation manuals and guides (e.g., Navigation Arctic Guide).

Risk is defined as the likelihood of harm posed by a hazard combined with its potential severity. The potential severity of shipping hazards<sup>10</sup> cannot be changed in most circumstances; what can be reduced is their likelihood. This is possible through the application of mitigation measures. The objective is, through the use of mitigation measures, to reduce the risk as low as practically possible. Residual risk is what remains after mitigation measures have been applied; those having the highest potential residual risk would be aggressively managed. The following mitigation/safety measures will be implemented:

- where available, electronic navigation aids will be used in all instances;
- subject to ship and human safety considerations ship speeds in open water are to remain less than 14 knots in the absence of marine mammals;
- shipping will only be carried out during the ice free season; should ice be encountered, the vessel will either sail around it at a reduced speed or proceed slowly through the ice;
- vessels will remain within recommended shipping routes;
- vessels will be double hulled;
- weather warnings will be consulted when updates are provided;
- traffic through the access passage will be coordinated to avoid conflicts and ensure safety;
- communication between tugs will coordinate movement through the access passage;
- Agnico Eagle will provide emergency response equipment and materials as outlined in the OPEP/OPPP if necessary; tug or ship will also provide their own emergency response equipment;
- crews will follow standard operating procedures and adherence to these will be monitored;
- tug-barge or ship crews are to be trained for responses to hazards that can normally be expected in northern waters;
- before entering Chesterfield Inlet the Master of the ship is to make a careful assessment of the conditions (wind, waves, tides, currents, visibility, ship characteristics, crew experience and etc.);
- after the assessment, the ship is to proceed in the safest way according to the assessment and surrounding conditions;
- the ship's speed will be adjusted according to the current;

---

<sup>10</sup> One hazard that can be reduced is shipping when ice is present. Agnico Eagle has opted to only ship during the ice-free season thereby greatly reducing this hazard.

- the tug-barges will always proceed in good visibility conditions; and
- the vessel Master will make up-bound travel with tidal flood (starting at low water at the entrance to Chesterfield Inlet) whenever possible. This allows to take advantage of tidal current and weaker freshwater discharge current at narrow passages at Deer Island and Target Rock.



---

**SECTION 11 • SOCIO-ECONOMIC IMPACT OF SHIPPING**

---

Agnico Eagle does not believe that Project related shipping activities will result in an increased demand on local public service providers (i.e., fire, police, ambulance, medical, and maintenance) in Chesterfield Inlet. In most circumstances, any emergency response will be undertaken by Agnico Eagle personnel and/or the ship's crew. Agnico Eagle personnel and the Master of the ship will be responsible for security matters related to the shipping-related activities.

Shipping may impact socio-economic activities in Chesterfield Inlet and Baker Lake. The following mitigation measures will be employed to minimize negative socio-economic effects:

- communication between tugs will coordinate movement through the access passage to avoid conflicts and ensure safety;
- Agnico Eagle has a separate laydown and storage area from the community in Baker Lake; and
- Agnico Eagle and the shipping contractor will work alongside to ensure security procedures are followed. This includes restricting the transport of prohibitive substances.

Positive socio-economic effects will continue as a result of the extension of the Meadowbank Mine and the associated number of dry cargo and fuel tankers coming to the communities. The crews of these ships could come ashore when the boat is anchored and contribute to the local economy through the:

- use of restaurants, hotels and stores in the community;
- purchase of local Inuit art; and
- guided tours to the barrens for fishing and wildlife experiences.

---

**SECTION 12 • PUBLIC AND MEDIA COMMUNICATIONS**

---

When an environmental emergency occurs, the public will be provided with timely and accurate information as to the nature of the incident, the steps being taken to correct the problem, and, if necessary, what citizens should do to protect themselves. This information is intended to protect the overall community wellbeing, including human health; to provide timely information amongst the public; to ensure cooperation from all interested parties; and to reduce the spread of concern or alarm through the dissemination of inaccurate information.

Each agency involved in a major spill event may provide its own media communications, and may designate spokespersons for such; however, from the Arctic REET's (Regional Environmental Emergencies Team) perspective, a coordinated response is preferable. To that end, the government lead Agency is expected to act as the official spokesperson for the response, with support provided by personnel within the Arctic REET, as required.

In the unlikely event of an environmental emergency relating to Project shipping, Transport Canada guidelines will be followed to ensure proper authorities are informed without delay so that appropriate action may be taken when:

- any incident occurs involving the loss, or likely loss, of dangerous goods into the marine environment; or
- any incident occurs giving rise to pollution or threat of pollution to the marine environment; or
- any oil pollution incident occurs involving the loading or unloading of fuel to or from tanker-to-tanker and from tanker to the Oil Handling Facility.

---

**REFERENCES**

---

NIRB. 2006. Project Certificate NIRB [NO.: 004] issued December 30, 2006 by the Nunavut Impact Review Board to Meadowbank Mining Corporation (assigned to Agnico Eagle Mines Limited)

NIRB. 2018. Project Certificate NIRB [NO.: 008] issued March 15, 2018 by the Nunavut Impact Review Board to Agnico Eagle Mines Limited for the development of Whale Tail Pit

Transport Canada. 2007. A Guide to Canada's Ballast Water Control and Management Regulations. Guideline TP 13617E

Transport Canada. 2009. Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants. Guideline TP 9834E.

Transport Canada. 2018. Implementation of the Polar Code in Canada: Challenges and Opportunities. Presentation.

**APPENDIX A • MARINE HYDROGRAPHIC CHARTS**

---

Chart 5002 Hudson Bay and Hudson Strait

Chart 5620 Entrance to Chesterfield Inlet

Chart 5621 Rockhouse Island to Centre Island

Chart 5622 Centre Island to Farther Hope Point

Chart 5623 Farther Hope Point to Terror Point

Chart 5624 Terror Point to Schooner Harbour

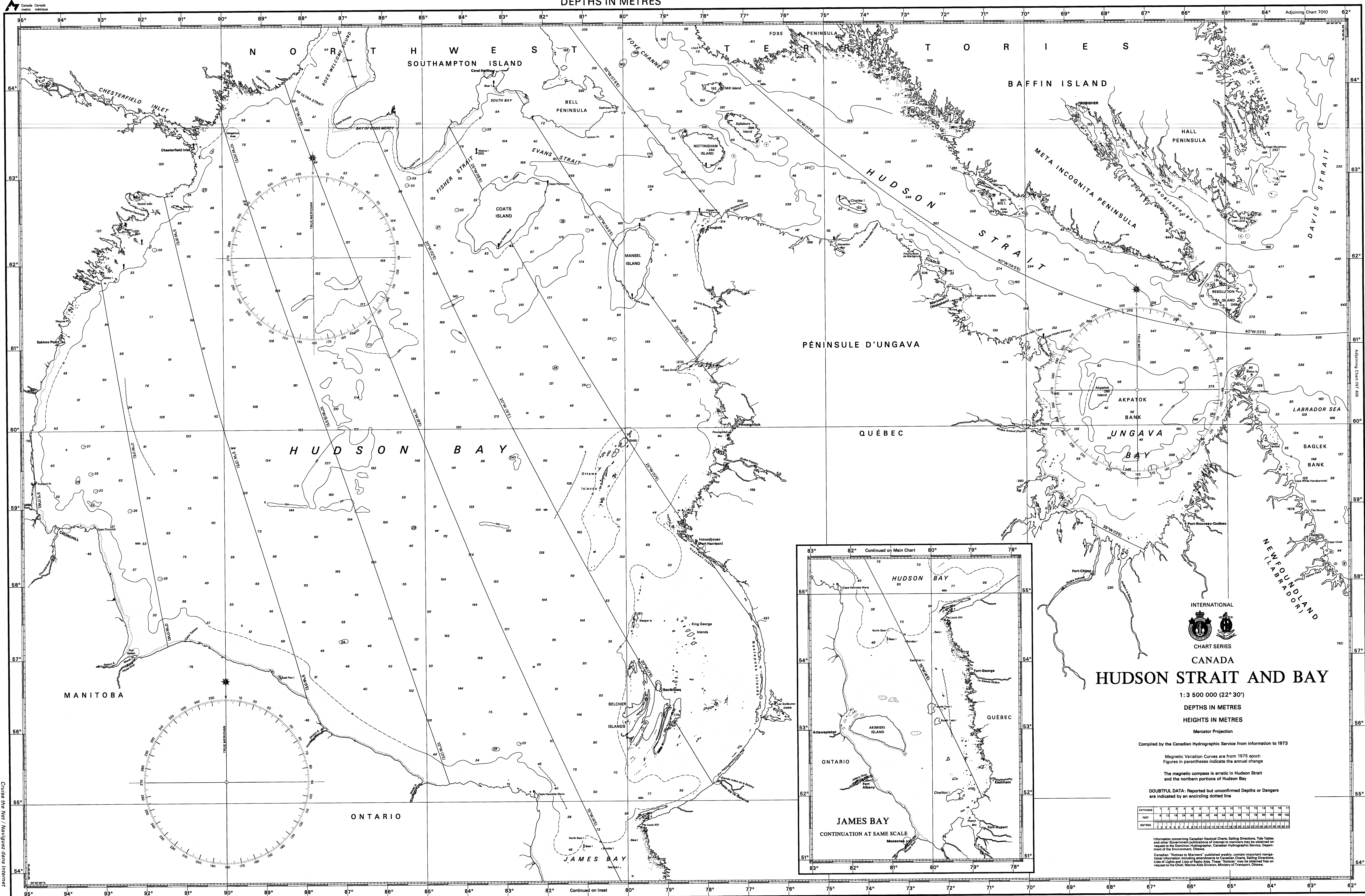
Chart 5625 Schooner Harbour to Baker Lake

Chart 5002 Hudson Bay and Hudson Strait

INT 406  
5002

DEPTHS IN METRES

DEPTHS IN METRES



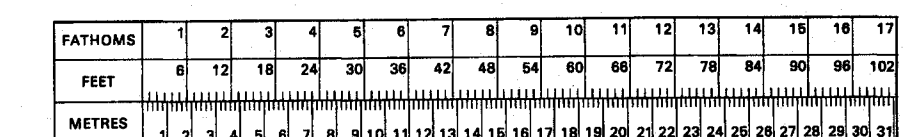
INTERNATIONAL  
  
 CHART SERIES  
 CANADA  
**HUDSON STRAIT AND BAY**  
 1:3 500 000 (22° 30')  
 DEPTHS IN METRES  
 HEIGHTS IN METRES  
 Mercator Projection

Compiled by the Canadian Hydrographic Service from information to 1973

Magnetic Variation Curves are from 1975 epoch  
 Figures in parentheses indicate the annual change

The magnetic compass is erratic in Hudson Strait  
 and the northern portions of Hudson Bay

DOUBTFUL DATA: Reported but unconfirmed Depths or Dangers  
 are indicated by an enclosing dotted line



Information concerning Canadian Nautical Charts, Sailing Directions, Light Lists  
 and other publications published by the Canadian Hydrographic Service, should  
 be obtained from the Hydrographic Office, Department of the Environment, Ottawa.

Canadian Hydrographic Service publications, including nautical charts, sailing  
 directions, tide and current tables, and other publications, are available from the  
 Hydrographic Office, Department of the Environment, Ottawa.

NEW CHART July 23 1975  
 Corrigés de MATIÈRES (Corrige Issues) FAVIS AUX NAVIGATEURS : 2006-03-01  
 See Notices to Mariners for subsequent corrections / Voir Avis aux navigateurs pour les corrections subséquentes

CHANGES Through  
 Notices to Mariners  
 2015-06-22  
 Changes par les Avis  
 aux navigateurs  
 le 22 juin 2015

**WARNING**  
 Mariners may find some lead lines painted black or  
 green and harness ropes painted black and white or red  
 and white. In both cases, either preparation or the  
 material used may be different from the standard. It is  
 important to handle the same nautical equipment in the  
 same way as the standard. See Notice to Mariners No. 820 of 1982.

**AVERTISSEMENT**  
 Les navigateurs peuvent trouver les bouées de sondage  
 ou vertes et les cordes de sonde peintes en noir et blanc  
 ou rouge et blanc. Dans ces deux cas, soit la préparation  
 soit le matériel utilisé peut être différent de la norme  
 standard. Il est important de manipuler le même  
 équipement maritime de la même façon que la norme  
 standard. Voir Avis aux navigateurs  
 No. 820 de 1982.

PUBLISHED BY THE CANADIAN HYDROGRAPHIC SERVICE  
 DEPARTMENT OF THE ENVIRONMENT, OTTAWA  
 © Her Majesty the Queen in Right of Canada, 1975  
 Nautical Charts Protect Lives, Property and the Marine Environment  
 Les cartes marines protègent la vie, la propriété et l'environnement marin

Canada  
 HUDSON STRAIT AND BAY  
 INT 406  
 5002

Consult the Net / Naviguer dans Internet  
 www.charts.gc.ca www.cbites.gc.ca

Chart 5620 Entrance to Chesterfield Inlet



CANADA  
NUNAVUT  
HUDSON BAY/BAIE D'HUDSON

# ENTRANCE TO/ENTRÉE À CHESTERFIELD INLET FAIRWAY ISLAND TO/À ELLIS ISLAND

Scale 1: 40 000 (63°30'N) Echelle  
Projection : Mercator

DEPTH in metres and are reduced to Chart Datum  
Cotes en mètres et sont réduites au zéro des cartes (la cote normale la plus basse), excepté à Chesterfield Inlet et de 2,5 mètres au-dessus du niveau moyen de l'eau (NMS).

ELEVATIONS and spot elevations are in metres above  
higher High Water, Large Tides. Underlined figures on  
dry-dock areas or in brackets against drying heights are  
in metres above Chart Datum.

LES ÉLÉVATIONS et les hauteurs sont en mètres au-  
dessus de la pleine mer haute, grandes marées. Les  
chiffres soulignés sur les zones sèches ou entre  
parenthèses contre les hauteurs de séchage sont en  
mètres au-dessus de zéro des cartes.

HORIZONTAL DATUM North American Datum 1983 (NAD 83),  
which is equivalent to WGS 84.

SISTÈME GÉODÉSIQUE : Système de référence géodé-  
sique de l'Amérique du Nord 1983 (NAD 83), qui  
correspond au WGS 84.

SOURCES : Levels per le Service hydrographique du  
Canada, 1992-1997.

Pour les signes conventionnels et les abréviations,  
consulter la carte n° 1.

TOTAL INFORMATION/RENSEIGNEMENTS SUR LES MAREES

LOCATION LOCALITE	Elevation above Chart Datum/Élévation au-dessus du zéro des cartes	Mean High Water Moyenne haute marée	Mean Low Water Moyenne basse marée
Chesterfield Inlet	4.3	0.1	4.2
Sandspit Island	4.3	0.1	4.2
Severn Harbour	5.8	0.1	4.7

CURRENTS  
The arrows indicate the approximate main flood and ebb  
directions. Rates given are for mean tide. The direction  
and rate of the tidal currents on any particular day  
will vary with the stage and range of the tide.

COURANTS  
Les flèches indiquent les directions principales  
approximatives du flot et du jusant. Les vitesses  
indiquées sont pour les marées moyennes. La direction  
et la vitesse des courants de marées peuvent varier  
considérablement dépendant du marée et du stade de  
la marée.

BLUE TINT  
On this chart unshaded water areas and areas with  
depths of 5 metres or less are tinted full blue.

TENTE BLEUE  
Les zones non ombragées et les zones de profondeurs  
de 5 mètres ou moins sont teintées en bleu plein.

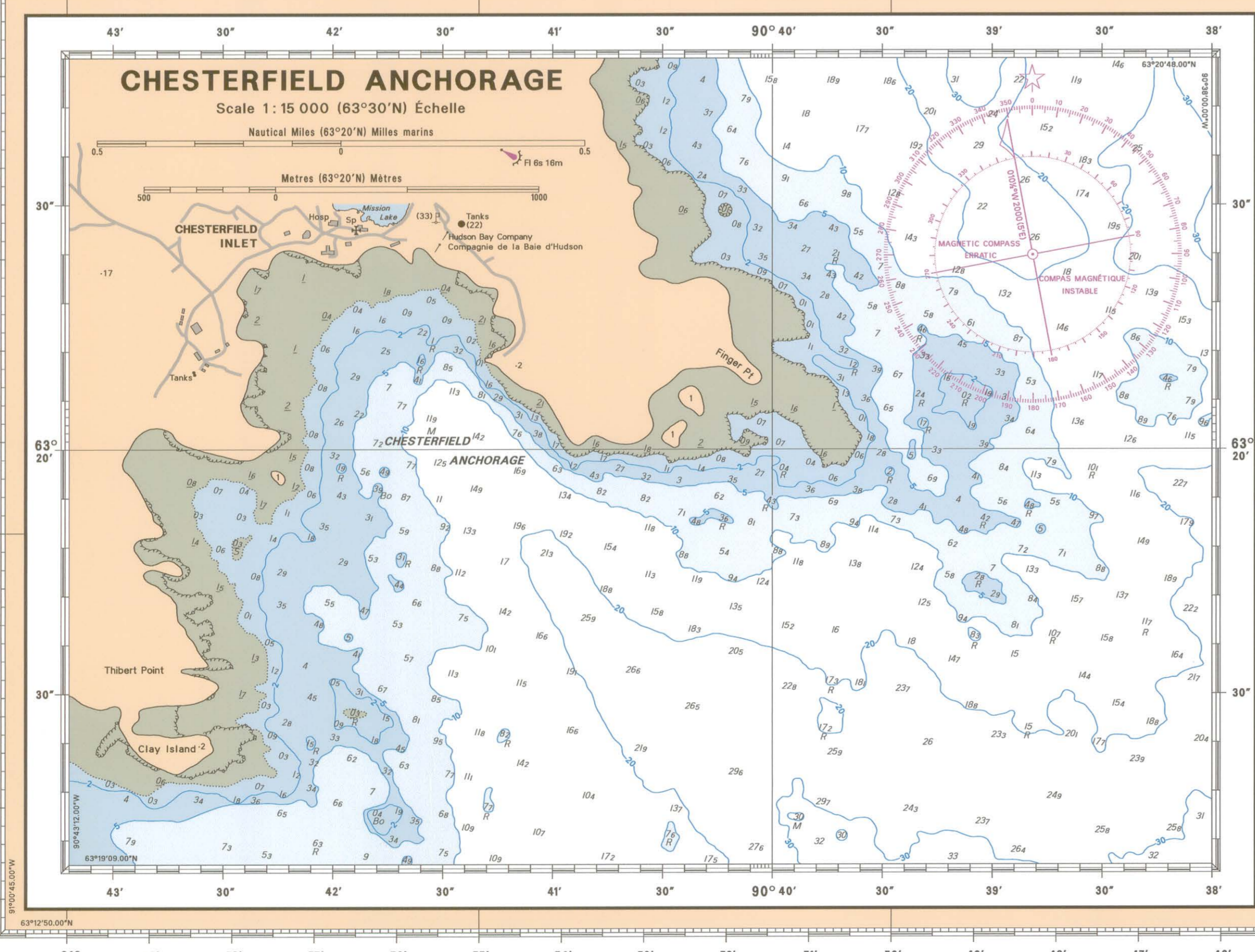
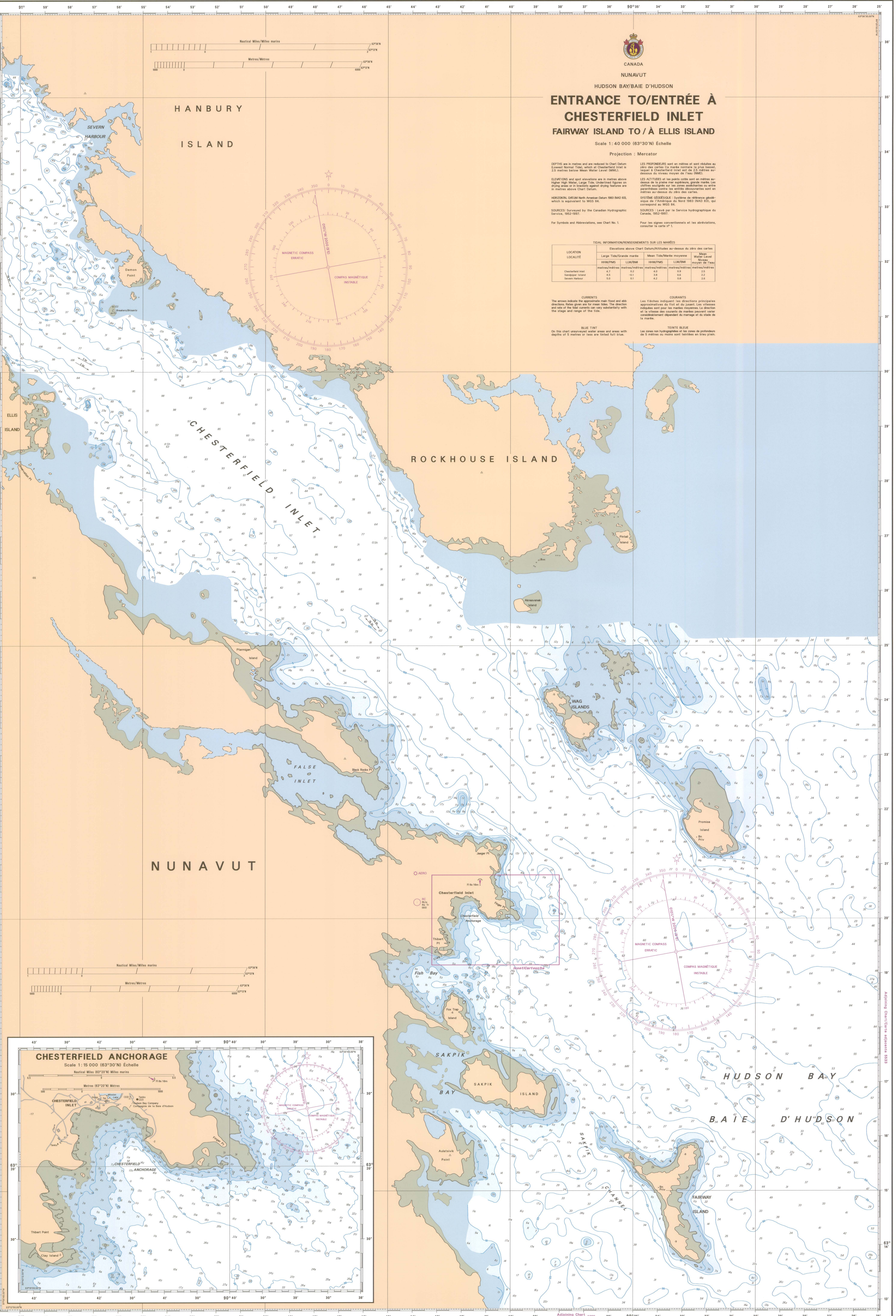
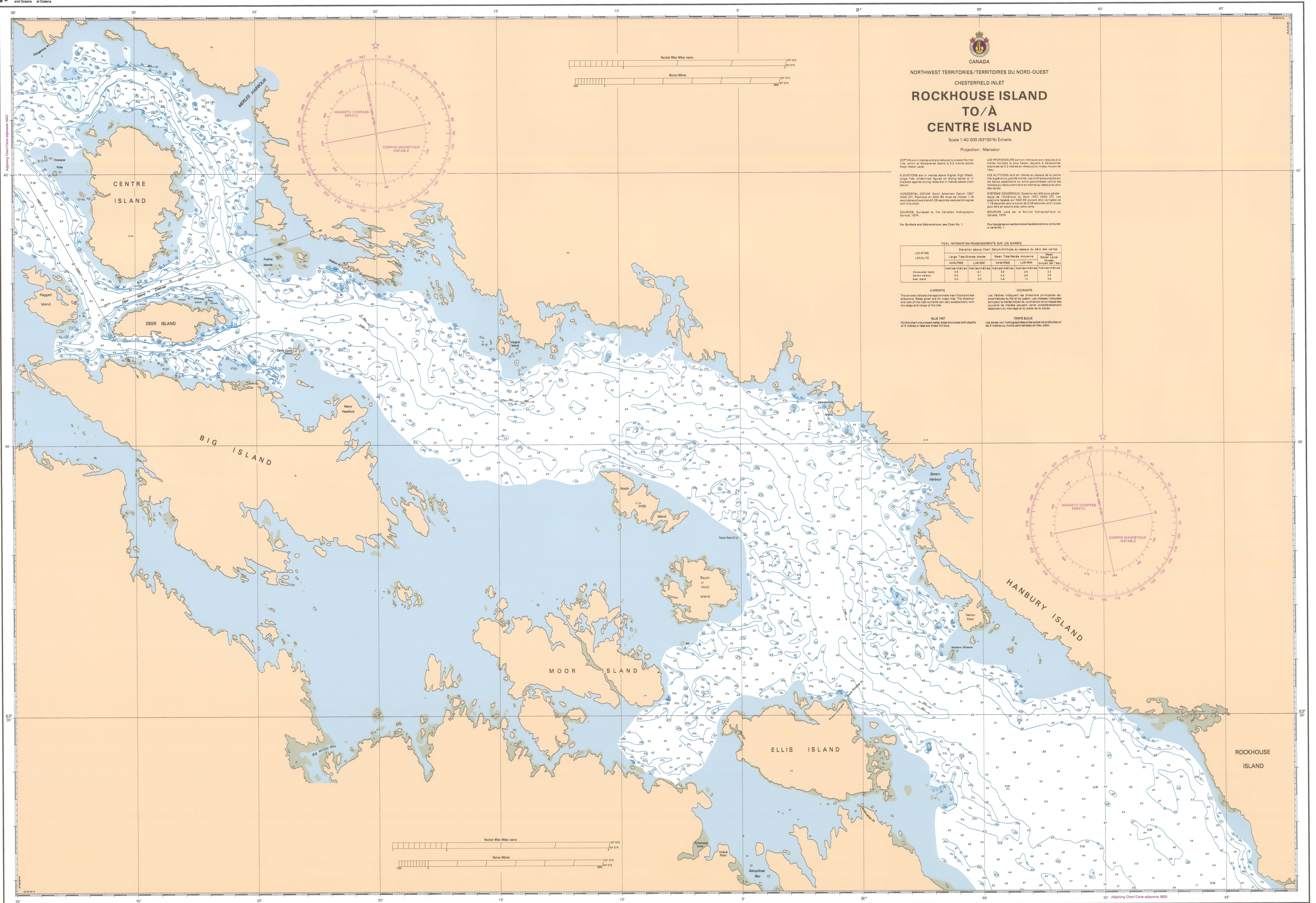




Chart 5621 Rockhouse Island to Centre Island



CANADA  
 NORTHWEST TERRITORIES / TERRITOIRES DU NORD-OUEST  
 CHESTERFIELD INLET  
**ROCKHOUSE ISLAND  
 TO/A  
 CENTRE ISLAND**  
 Scale 1:40 000 (63°30'N) Echelle

Projection : Mercator

DEPTHS are in metres and are reduced to Lowest Tidal Tide, which is Acrements Island is 2.2 metres below Mean High Water.

ELEVATIONS are in metres above High Water. Large Tide, Underlined figures on drying banks or in patches against drying rocks are in metres above chart datum.

HORIZONTAL DATUM: North American Datum 1983 (NAD 83). Positions on NAD 83 must be moved 1.66 seconds eastward and 0.26 seconds westward to agree with this chart.

SOURCES: Surveyed by the Canadian Hydrographic Service, 1974.

For Symbols and Abbreviations, see Chart No. 1.

LES PROFONDEURS sont en mètres et sont réduites à la marée basse la plus basse, laquelle à Acrements Island est de 2,2 mètres au-dessous du niveau moyen de la mer.

LES ÉLEVATIONS sont en mètres au-dessus de la pleine mer supérieure, grande marée. Les chiffres soulignés sur les bancs asséchés ou enroulés par rapport aux rochers qui s'assèchent sont en mètres au-dessus du zéro des cartes.

SISTÈME GÉODÉSIQUE: Système de référence géodésique de l'Amérique du Nord 1983 (NAD 83). Les positions basées sur NAD 83 doivent être corrigées de 1,66 seconde vers le sud et de 0,26 seconde vers l'est pour être en accord avec cette carte.

LES SOURCES: Levés par le Service hydrographique du Canada, 1974.

Pour les signes conventionnels et les abréviations, consulter la carte No. 1.

TIDAL INFORMATION / RENSEIGNEMENTS SUR LES MAREES

LOCATION	Elevation above Chart Datum / Élévation au-dessus du zéro des cartes	Low	High
LOCALITE	Large Tide / Grande marée	Low Water / Niveau bas	High Water / Niveau haut
	METRES / MÈTRES	METRES / MÈTRES	METRES / MÈTRES
Acrements Island	4.5	-1.1	2.9
Green Harbour	5.0	0.1	4.2
Star Island	6.4	0.3	4.8

CURRENTS  
 The arrows indicate the approximate mean flood and ebb directions. Some give the flow rate. The direction and rate of the tidal currents can vary substantially with the stage and range of the tide.

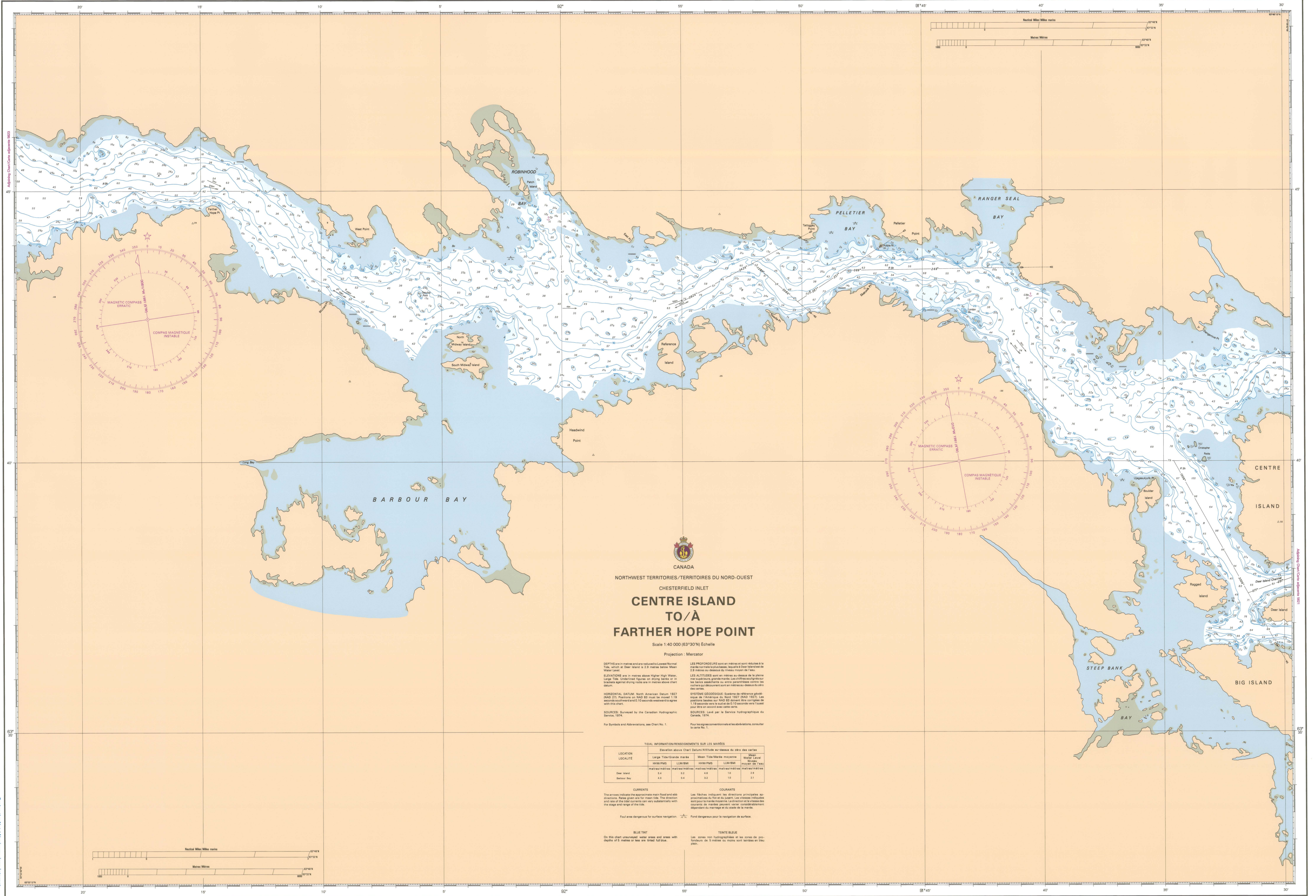
LES FLÈCHES indiquent les directions principales approximatives du flot et du jusant. Les flèches indiquent aussi le débit moyen. La direction et le débit des courants de marée peuvent varier considérablement en fonction du marée et du stade de la marée.

BLUE TINT  
 On this chart uncharted water areas and areas with depths of 8 metres or less are tinted full blue.

TENTE BLEUE  
 Les zones non hydrographiques et les zones de profondeur de 8 mètres ou moins sont teintées en bleu plein.

Chart 5622 Centre Island to Farther Hope Point

5622



CANADA  
 NORTHWEST TERRITORIES/TERRITOIRES DU NORD-OUEST  
 CHESTERFIELD INLET  
**CENTRE ISLAND  
 TO / À  
 FARTHER HOPE POINT**

Scale 1:40 000 (63°30'N) Echelle  
 Projection: Mercator

DEPTHS are in metres and are reduced to Lowest Normal Tide, which at Deer Island is 2.9 metres below Mean Water Level.  
 ELEVATIONS are in metres above Higher High Water.  
 Large Tide: Sounding figures on spring tides or in brackets against drying rocks are in metres above chart datum.  
 HORIZONTAL DATUM: North American Datum 1987 (NAD 87). Positions on NAD 83 must be moved 1.19 seconds southward and 0.10 seconds westward to agree with this chart.  
 SOURCES: Surveyed by the Canadian Hydrographic Service, 1974.  
 For Symbols and Abbreviations, see Chart No. 1.

LES PROFONDEURS sont en mètres et sont réduites à la marée normale la plus basse, laquelle à Deer Island est de 2,9 mètres au-dessous du niveau moyen de l'eau.  
 LES ALTITUDES sont en mètres au-dessus de la pleine mer supérieure.  
 Grande Marée: Les chiffres indiqués sur les rochers à marée basse ou les rochers qui découvrent sont en mètres au-dessus du zéro des cartes.  
 SYSTÈME GÉODÉSIQUE: Système de référence géodésique de l'Amérique du Nord 1987 (NAD 1987). Les positions basées sur NAD 83 doivent être corrigées de 1,19 seconde vers le sud et de 0,10 seconde vers l'ouest pour être en accord avec cette carte.  
 SOURCES: Levés par le Service hydrographique du Canada, 1974.  
 Pour les symboles conventionnels et les abréviations, consulter la carte No. 1.

TIDAL INFORMATION/RENSEIGNEMENTS SUR LES MAREES

LOCATION LOCALITE	Elevation above Chart Datum/Altitude au-dessus de zéro des cartes		Mean Tide/Marque moyenne		Water Level
	High/PMMS mètres/mètres	Low/PMMS mètres/mètres	High/PMMS mètres/mètres	Low/PMMS mètres/mètres	Niveau moyen de l'eau mètres/mètres
Deer Island	6.4	3.2	4.4	1.0	3.8
Barbour Bay	4.0	0.4	3.2	1.0	3.1

CURRENTS  
 The arrows indicate the approximate main flood and ebb directions. Rates given are for mean tide. The direction and rate of the tide currents are very substantially with the stage and range of the tide.  
 Fond dangereux pour la navigation de surface.

COURANTS  
 Les flèches indiquent les directions principales approximatives du flot et du jusant. Les vitesses indiquées sont pour le marée moyenne. La direction et le rapport des courants de marée peuvent varier considérablement dépendant du marée et du stade de la marée.  
 Fond dangereux pour la navigation de surface.

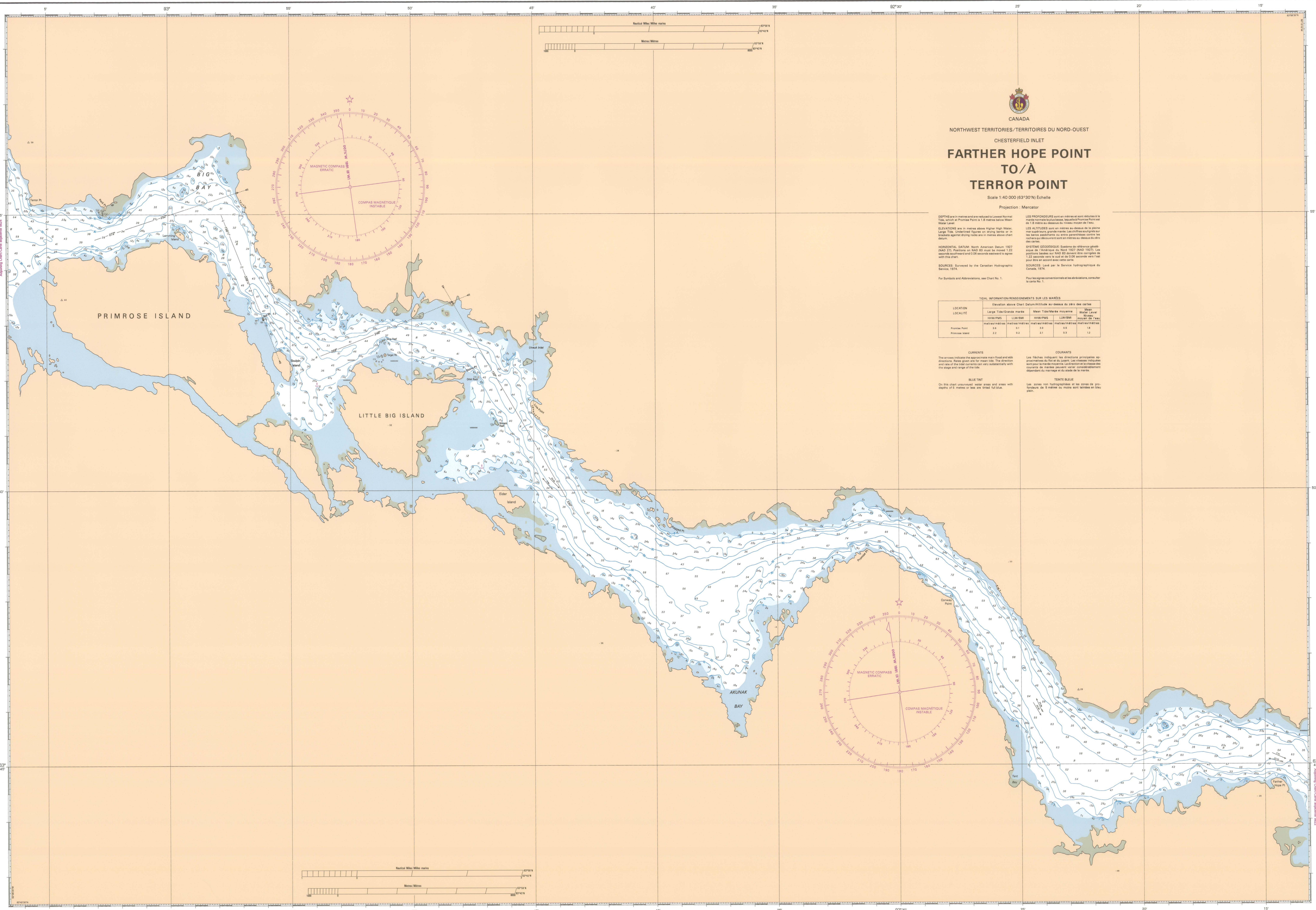
BLUE TINT  
 On this chart unurveyed water areas and areas with depths of 5 metres or less are tinted full blue.

TINTE BLEUE  
 Les zones non hydrographiques et les zones de profondeurs de 5 mètres ou moins sont teintées en bleu plein.

Chart the Net / Naviguez dans Internet  
www.charts.gc.ca www.chartes.gc.ca

INCHES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	BARRES
FEET	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
METRES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Chart 5623 Farther Hope Point to Terror Point



CANADA  
 NORTHWEST TERRITORIES/TERRITOIRES DU NORD-OUEST  
 CHESTERFIELD INLET  
**FARTHER HOPE POINT  
 TO/À  
 TERROR POINT**

Scale 1:40 000 (63°30'N) Échelle  
 Projection: Mercator

DEPTHS are in metres and are reduced to Lowest Normal Tide, which at Primrose Point is 1.8 metres below Mean Water Level.  
 LES PROFONDEURS sont en mètres et sont réduites à la marée normale la plus basse, laquelle à Primrose Point est de 1.8 mètre au-dessous du niveau moyen de l'eau.  
 ELEVATIONS are in metres above High Water, Large Tide. Underlined figures on drying banks or in brackets against drying rocks are in metres above chart datum.  
 LES ALTITUDES sont en mètres au-dessus de la pleine mer supérieure, grande marée. Les chiffres soulignés sur les bancs exposés ou entre parenthèses contre les rochers qui découvrent sont en mètres au-dessus du zéro des cartes.  
 HORIZONTAL DATUM: North American Datum, 1927  
 NAD 27. Positions on NAD 83 must be moved 1.25 seconds eastward and 0.06 seconds eastward to agree with this chart.  
 SYSTÈME GÉODÉSIQUE: Système de référence géodésique de l'Amérique du Nord 1927 (NAD 1927). Les positions basées sur NAD 83 doivent être corrigées de 1.25 secondes vers le sud et de 0.06 secondes vers l'est pour être en accord avec cette carte.  
 SOURCES: Levé par le Service hydrographique du Canada, 1974.  
 Pour les symboles, commentaires et les abréviations, consulter le carte No. 1.

TIDAL INFORMATION/RENSEIGNEMENTS SUR LES MAREES

LOCATION LOCALITE	Elevation above Chart Datum/Altitude au-dessus du zéro des cartes		Mean Tide/Moyenne marée		Water Level
	Large Tide/Grande marée	Mean Tide/Moyenne marée	Low/Bas	High/Haut	Mean Moyenne
	metres/mètres	metres/mètres	metres/mètres	metres/mètres	metres/mètres
Primrose Point	3.4	0.1	3.0	0.5	1.8
Primrose Island	2.2	0.2	2.1	0.3	1.3

CURRENTS

The arrows indicate the approximate main flood and ebb directions. Rates given are for mean tide. The direction and rate of the tidal currents can vary substantially with the stage and range of the tide.

COURANTS

Les flèches indiquent les directions principales approximatives du flot et du jusant. Les vitesses indiquées sont pour la marée moyenne. La direction et l'intensité des courants de marée peuvent varier considérablement dépendant du marée et du stade de la marée.

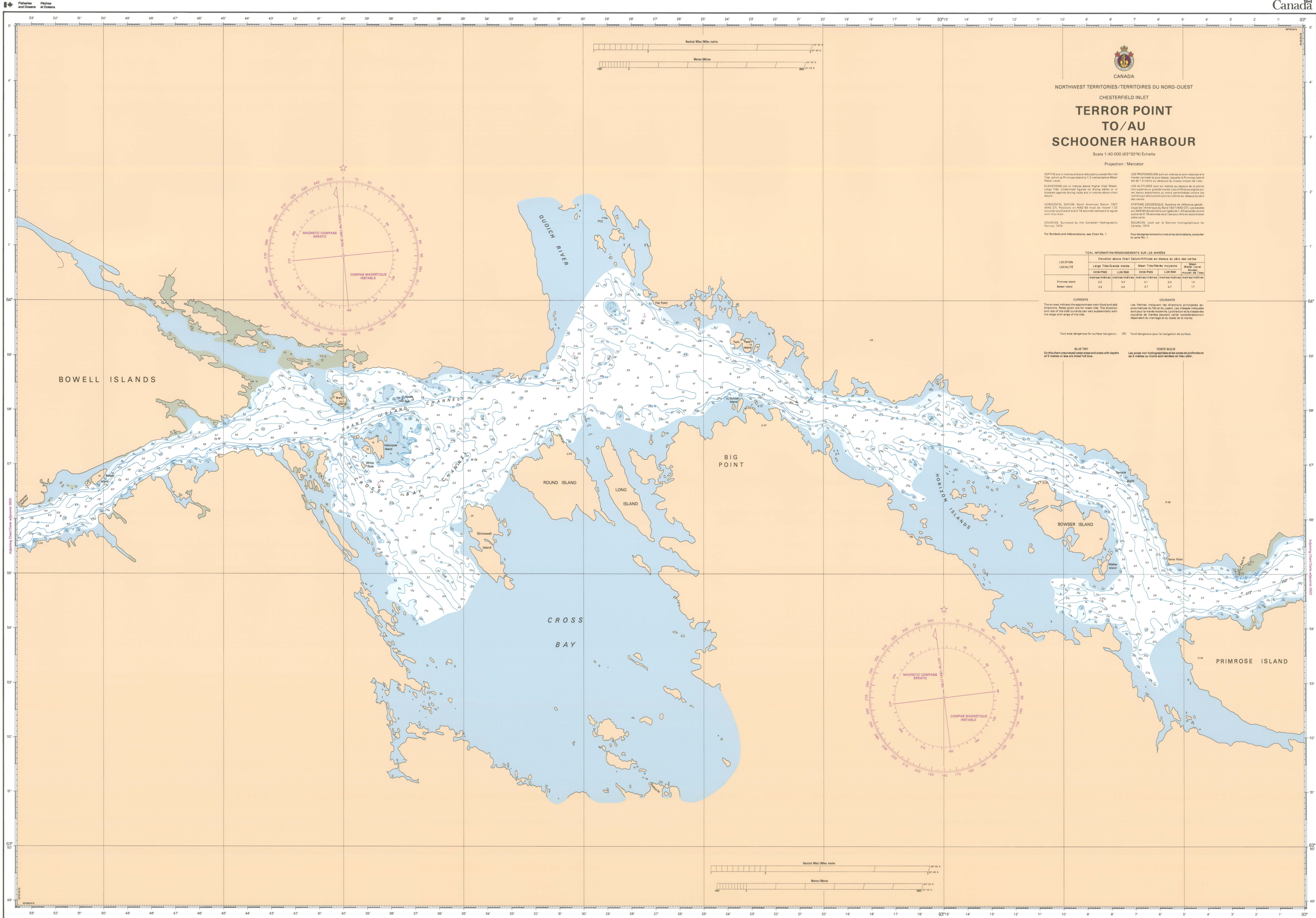
BLUE-TINT

On this chart unsurveyed water areas and areas with depths of 5 metres or less are shaded full blue.

TENTE BLEUE

Les zones non hydrographiques et les zones de profondeur de 5 mètres ou moins sont teintées en bleu plein.

Chart 5624 Terror Point to Schooner Harbour



CANADA  
 NORTHWEST TERRITORIES / TERRITOIRES DU NORD-OUEST  
 CHESTERFIELD INLET  
**TERROR POINT  
 TO/AU  
 SCHOONER HARBOUR**  
 Scale 1:40 000 (63°30'N) Echelle  
 Projection : Mercator

DEPTHS are in metres and are reduced to Lowest Normal Tide, which at Primrose Island is 1.2 metres below Mean Water Level.  
 ELEVATIONS are in metres above Higher High Water.  
 Large Tide Underlined figures on drying banks or on rocks against drying rocks are in metres above chart datum.  
 HORIZONTAL DATUM: North American Datum 1927 (NAD 27). Positions on NAD 83 must be moved 1.22 seconds eastward and 0.18 seconds southward to agree with this chart.  
 SOURCES: Surveyed by the Canadian Hydrographic Service, 1974.  
 For Symbols and Abbreviations, see Chart No. 1.

LES PROFONDEURS sont en mètres et sont réduites à la marée normale la plus basse, laquelle à Primrose Island est de 1,2 mètres au-dessous du niveau moyen des eaux.  
 LES ALTITUDES sont en mètres au-dessus de la plus haute marée haute.  
 Les chiffres soulignés sur les bancs et sur les rochers sont en mètres au-dessus du niveau du chart datum.  
 SYSTÈME GÉODÉSIQUE: Système de référence géodésique en l'Amérique du Nord 1927 (NAD 27). Les bases au NAD 83 doivent être corrigées de 1,22 secondes vers le sud et de 0,18 secondes vers le nord pour être en accord avec cette carte.  
 SOURCES: Levés par le Service hydrographique du Canada, 1974.  
 Pour les symboles et abréviations, consulter la carte No. 1.

TIDAL INFORMATION/RENSEIGNEMENTS SUR LES MARÉES

LOCATION LOCALITÉ	Elevation above Chart Datum/Altitude au-dessus du zéro des cartes				
	Large Tide/Grande marée	Mean Tide/Marée moyenne	Neap Tide/Marée morte	Water Level/ Niveau de l'eau	Mean Low Water/ Niveau de l'eau basse
Primrose Island	2.3	0.3	2.1	0.3	1.9
Bowser Island	2.9	0.8	2.7	0.7	1.7

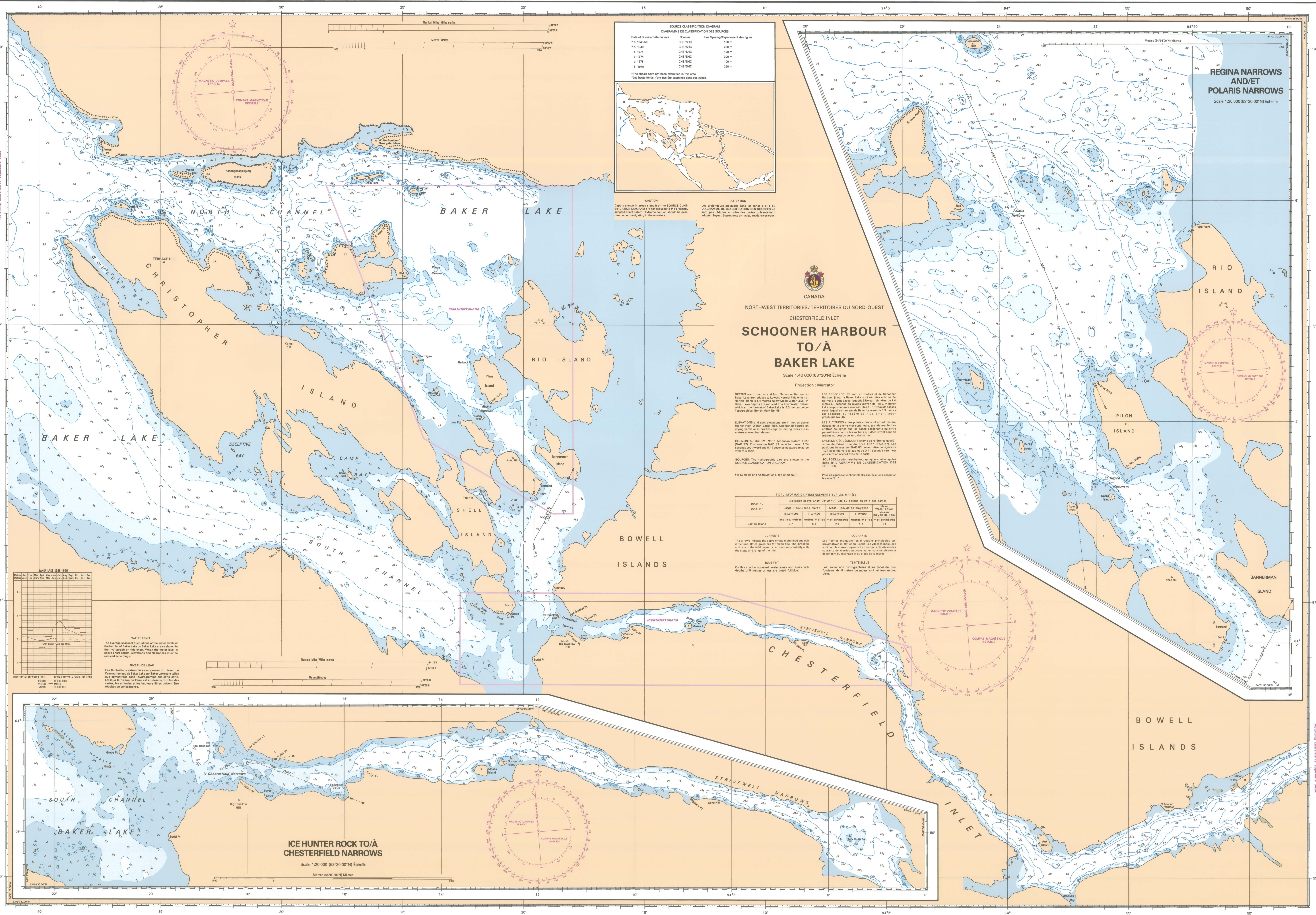
CURRENTS  
 The arrows indicate the approximate main flood and ebb directions. Arrows given are for mean tide. The direction and rate of the tidal currents can vary substantially with one stage and range of the tide.  
 Les flèches indiquent les directions principales approximatives du flot et du jusant. Les flèches indiquées sont pour la marée moyenne. La direction et la vitesse des courants de marée peuvent varier considérablement dépendant du marée et du stade de la marée.

Foul area dangerous for surface navigation. ⚠️ Fond dangereux pour la navigation de surface.  
 BLUE TINT  
 On this chart uncharted rocks and areas with depths of 5 metres or less are tinted full blue.  
 TEINTE BLEUE  
 Les zones non hydrographiques et les zones de profondeurs de 5 mètres ou moins sont teintées en bleu plein.



Chart 5625 Schooner Harbour to Baker Lake

5625



**SOURCE CLASSIFICATION DIAGRAM**  
**DIAGRAMME DE CLASSIFICATION DES SOURCES**

Date of Survey / Date de levé	Source	Line Spacing / Espacement des lignes
1-1948-50	CHS/SHC	100 m
1-1948	CHS/SHC	200 m
1-1974	CHS/SHC	100 m
1-1974	CHS/SHC	200 m
1-1978	CHS/SHC	100 m
1-1978	CHS/SHC	200 m

\*The shoals have not been examined in this area.  
 \*Les bancs n'ont pas été examinés dans ces zones.

**CAUTION**  
 Depths shown in areas A and B of the SOURCE CLASSIFICATION DIAGRAM are not related to the present chart datum. Caution should be observed when navigating in these waters.

**ATTENTION**  
 Les profondeurs indiquées dans les zones A et B du DIAGRAMME DE CLASSIFICATION DES SOURCES ne sont pas reliées au datum de ce plan. Attention doit être exercée lors de la navigation dans ces zones.

**CANADA**  
 NORTHWEST TERRITORIES / TERRITOIRES DU NORD-OUEST  
**CHESTERFIELD INLET**  
**SCHOONER HARBOUR TO / À BAKER LAKE**  
 Scale 1:40 000 (63°30'N) Echelle  
 Projection: Mercator

**DEPTHS** are in metres and from Schooner Harbour to Baker Lake are related to Lowest Normal Tide which is Normal Island at 1.4 metres above Mean Water Level. In Baker Lake depths are related to a Low Water Datum which is the height of Baker Lake in 5.3 metres below Topographic Bench Mark No. 45.

**LES PROFONDEURS** sont en mètres et de Schooner Harbour jusqu'à Baker Lake sont reliées à la marée normale la plus basse, laquelle à Norton Island est de 1.4 mètre au-dessus du niveau moyen de l'eau. À Baker Lake les profondeurs sont reliées au niveau de basses eaux, lequel au banc de Baker Lake est de 5.3 mètres au-dessous de la cote de référence topographique No. 45.

**ELEVATIONS** and spot elevations are in metres above Higher High Water, Large Tide. Contoured figures on drying banks or on brackets against drying rocks are in metres above chart datum.

**LES ALTITUDES** et les points cotés sont en mètres au-dessus de la pleine mer supérieure, grande marée. Les chiffres indiqués sur les bancs marécageux ou sur les échelons contre les rochers qui découvrent sont en mètres au-dessus du datum de la carte.

**HORIZONTAL DATUM** North American Datum 1927 (NAD 27). Positions on NAD 83 must be moved 1.24 seconds eastward and 0.4 seconds eastward to agree with this chart.

**SYSTEME GÉODÉSIQUE** Système de référence géodésique de l'Amérique du Nord 1927 (NAD 27). Les positions basées sur NAD 83 doivent être corrigées de 24 secondes vers le sud et de 40 secondes vers l'est pour être en accord avec cette carte.

**SOURCES** The hydrographic data shown in the SOURCE CLASSIFICATION DIAGRAM.

**SOURCES** Les données hydrographiques sont indiquées dans le DIAGRAMME DE CLASSIFICATION DES SOURCES.

For Symbols and Abbreviations, see Chart No. 1.  
 Pour les signes conventionnels et les abréviations, consulter la carte No. 1.

**TIDAL INFORMATION / RENSEIGNEMENTS SUR LES MARES**

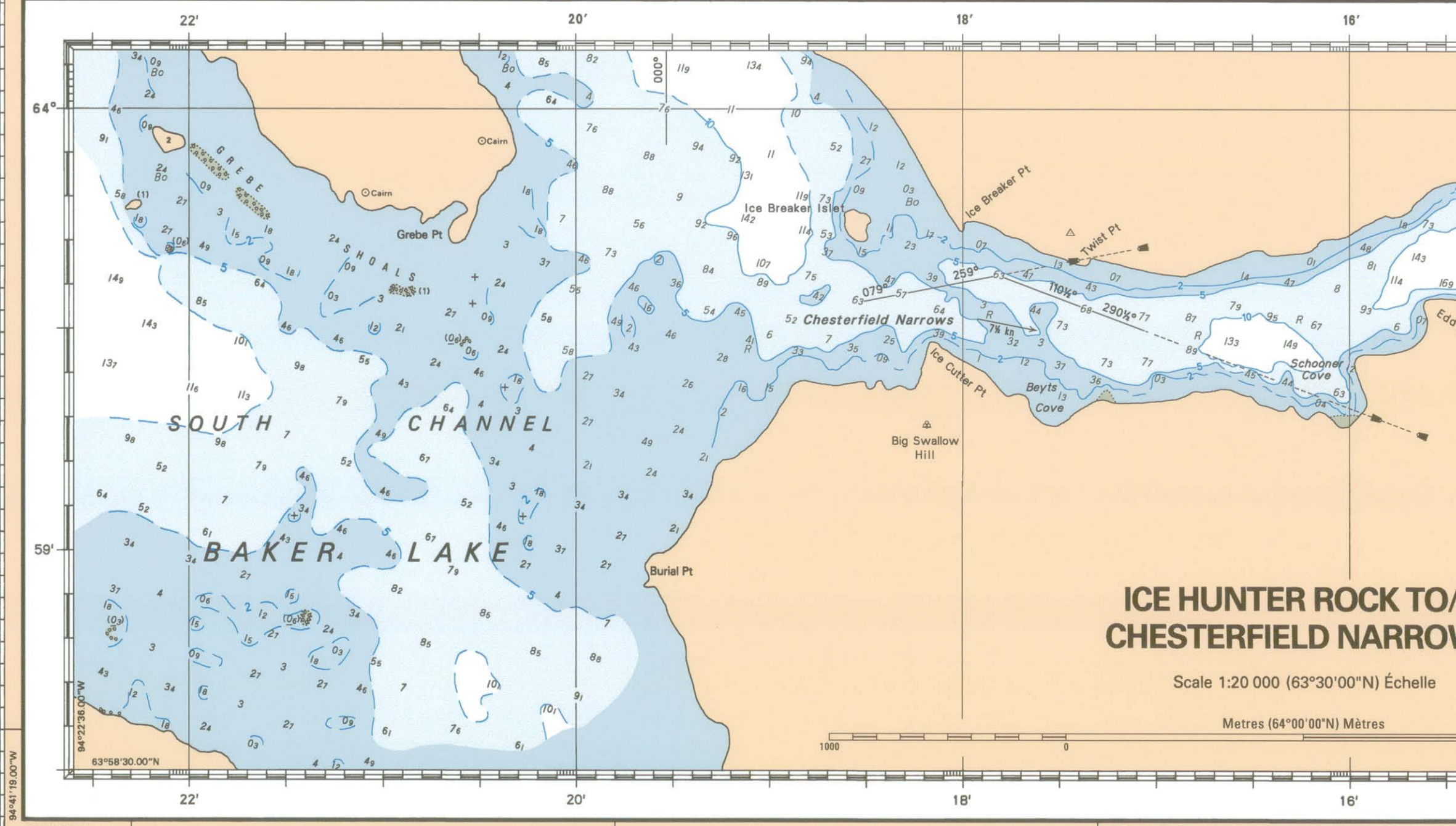
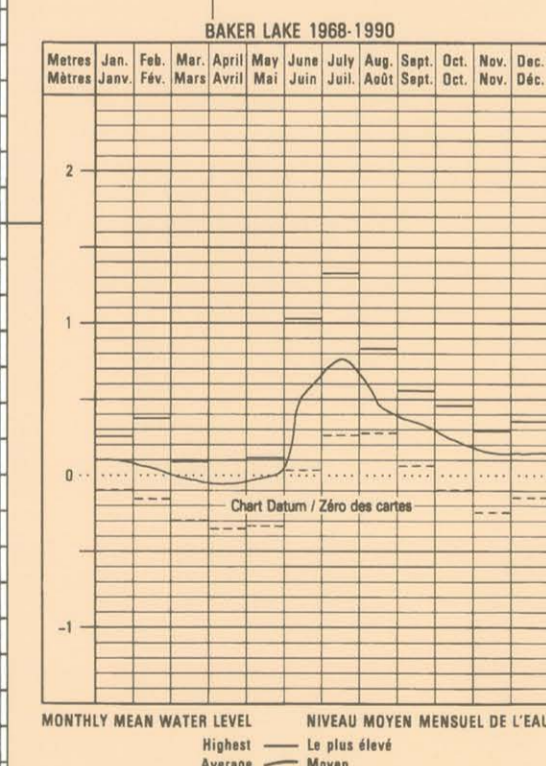
LOCATION	Elevation above Chart Datum / Altitude au-dessus du zéro des cartes			
Large Tide / Grande marée	Mean Tide / Marge moyenne	Mean Tide / Marge moyenne	Mean Tide / Marge moyenne	
LOW/PM5	LW/PM1	HW/PM5	LW/PM1	
metres/mètres	metres/mètres	metres/mètres	metres/mètres	
Norton Island	2.7	0.2	2.4	0.3

**CURRENTS**  
 The arrows indicate the direction of the principal currents. Rates given are for mean tide. The direction of the surface currents can vary substantially with the stage and range of the tide.

**COURANTS**  
 Les flèches indiquent les directions principales des courants de flot et de jusant. Les vitesses indiquées sont pour la marée moyenne. La direction des courants de surface peut varier considérablement en fonction du stade et de l'étendue de la marée.

**BLUE TINT**  
 On this chart uncharted water areas and areas with depths of 5 metres or less are tinted light blue.

**TENUE BLEUE**  
 Les zones non hydrographées et les zones de profondeurs de 5 mètres ou moins sont teintées en bleu pâle.



5625

METRES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
FEET	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90
FATHOMS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

**APPENDIX B • MARINE MAMMAL MANAGEMENT AND MONITORING PLAN**

---



# **AGNICO EAGLE**

## Marine Mammal and Seabird Management and Monitoring Plan

---

Appendix B

**APRIL 2022  
VERSION 4**

**TABLE OF CONTENTS**

<b>Table of Contents</b> .....	<b>i</b>
<b>Document Control</b> .....	<b>ii</b>
<b>Acronyms</b> .....	<b>iii</b>
<b>Section 1 • Introduction</b> .....	<b>iv</b>
<b>Section 2 • Marine Mammal and Seabird Observer Program</b> .....	<b>v</b>
2.1 Routine Shipping Operations.....	v
2.1.1 Program Protocol .....	v
2.1.3 Marine Mammal Observing Protocol.....	viii
2.1.3.1 Scan Routine .....	ix
2.1.3.2 Scan Routine .....	x
2.1.4 Seabird Survey Protocol .....	xi
2.1.4.1 Survey Protocol – Moving Vessel.....	xi
2.1.4.1 Survey Protocol – Stationary Vessel.....	xiv
2.1.4.1 Estimating Distance .....	xv
2.1.5 Recording Observations.....	xv

**DOCUMENT CONTROL**

Version	Date	Section	Page	Revision	Author
1	April 2018	All	All	First draft of the Marine Mammal Management and Monitoring Plan	Agnico Eagles Mines Ltd.
2_NIRB	December 2018	All	All	Shipping Management Plan as Supporting Document submitted to Nunavut Impact Review Board for review and approval as part of Whale Tail Pit – Expansion Project	Agnico Eagle Mines Ltd.
3	April 2022	Attachment A	xvii	Updated Marine Mammals Sightings Form	Agnico Eagle Mines Ltd.
		Attachment B	xx	Updated Seabird Sightings Form	
		Attachment C	xxii	Added MSSO Incident Report Form Added Incidental Marine Wildlife Sightings Form	

**ACRONYMS**

---

Agnico Eagle	Agnico Eagle Mines Limited
CWS	Canadian Wildlife Service
DFO	Fisheries and Oceans Canada
ECSAS	Eastern Canada Seabird at Sea
ECCC	Environment and Climate Change Canada
MMMMP	Marine Mammal Management and Monitoring Plan
MMSO	Marine Mammal and Seabird Observer
NIRB	Nunavut Impact Review Board

**SECTION 1 • INTRODUCTION**

---

The Marine Mammal Management and Monitoring Plan (MMMMMP) has been developed for the Project to meet commitments made during the Nunavut Impact Review Board (NIRB) hearings related to Marine Shipping, and will continue to be implemented under the Whale Tail Pit and Haul Road Project (the Approved Project) and the Whale Tail Pit - Expansion Project. It should be considered a living document that can be updated throughout the Project lifecycle in order to implement adaptive management techniques.

The MMMMP has been designed to provide protocols for conducting a vessel-based Marine Mammal and Seabird Observer (MMSO) program during all routine shipping activities along the shipping route. During routine shipping operations, Project-specific mitigation measures designed to minimize Project impacts on marine mammals and seabirds will be initiated by vessel-based MMSOs and implemented by the ship's crew.

Data collected by the MMSOs will provide information annually to the Government of Nunavut and other applicable regulators (e.g., Environment and Climate Change Canada (ECCC) - Canadian Wildlife Service (CWS)) regarding the location, behaviour, abundance, and species observed as well as any interactions with Project vessels during shipping activities along the shipping route.



---

**SECTION 2 • MARINE MAMMAL AND SEABIRD OBSERVER PROGRAM**

---

**2.1 Routine Shipping Operations**

This section outlines the protocol for undertaking a vessel-based Marine Mammal and Seabird Observer (MMSO) program involving marine wildlife monitoring during all routine shipping activities in the shipping route in accordance with Project Certificate Condition 40, which states the following:

*"The Proponent shall develop and implement a ship-based marine mammal monitoring program, as part of a Marine Mammal Management and Monitoring Plan, in consultation with Fisheries and Oceans Canada, communities, and other interested parties. The Proponent shall report any accidental contact by project vessels with marine mammals or seabird colonies to applicable responsible authorities including Fisheries and Oceans Canada and Environment and Climate Change Canada. "*

The MMSOs will record marine mammal and seabird observations based on the protocols along the shipping routes presented in Figure 1. Datasheets outlined in Attachment A and Attachment B and daily reports outlined in Attachment C will be completed throughout the transit and provided to Agnico Eagle.

**2.1.1 Program Protocol**

Mitigation measures outlined in Section 4.2 of the Shipping Management Plan will be implemented during all Project shipping activities by the shipping contractor(s). MMSOs will not be directly responsible for implementing mitigation measures. The role of the MMSO is to record and report on marine mammals and seabird sightings during shipping activities, and to advise the ship's crew on the location of observed marine mammals and if any action is recommended based on mitigation measures outlined in the Shipping Management Plan.

The following protocol will be implemented during the MMSO program:

- A minimum of one assigned MMSO will be present on-board the Project shipping vessels<sup>1</sup> during all transits;
- The MMSO will conduct marine mammal and seabirds observations along the shipping route from the bridge during daylight hours;
- The MMSO will observe and record sightings of marine mammals and birds during vessel movements in the shipping routes (including sea birds, coastal waterfowls, and sea ducks<sup>2</sup>) as well as environmental conditions;

---

<sup>1</sup> Contractor is responsible to assign a crew member or contractor the task of marine mammal observations (MMSO).

<sup>2</sup> In accordance with Project Certificate No 008 Condition 39 and 40.

- The shipping contractor will initiate mitigation measures designed to minimize Project impacts on marine mammals and seabirds, as identified in the Shipping Management Plan.

The MMSO program will allow for the opportunity of adaptive management techniques to be implemented if monitoring identifies potential for adverse effects on marine wildlife along the shipping route. This may include modification of mitigation measures in response to new information arising from the monitoring carried out by the MMSO. Adaptive management will be conducted in consultation with the Kivalliq Inuit Association, the Hunters and Trappers Organizations of the Kivalliq communities, and the relevant regulators.

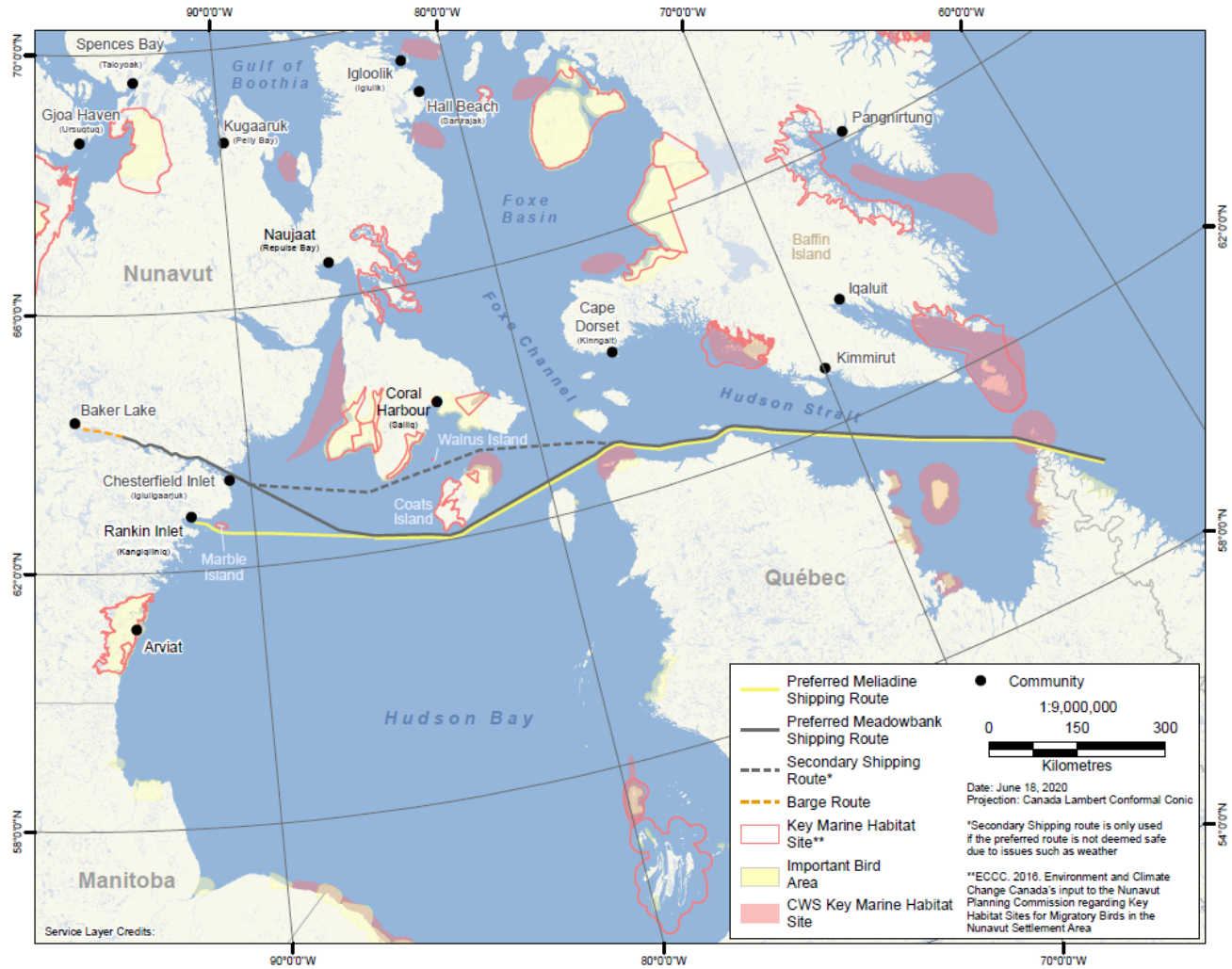


Figure 1: Meadowbank Mine and Whale Tail Pit Expansion Project Shipping Routes

### 2.1.3 Marine Mammal Observing Protocol

General environmental and marine mammal sightings information is to be collected and recorded by filling out form in Attachment A.

The protocol outlined in this section are best conducted along a transect line, therefore, it is best to start a marine mammal observation period when the vessel is and will be moving in a straight line for an extended period of time.

#### Observer Position

Observations will be done from a high location on the vessel and ideally outdoors if possible and will be conducted at the same location each time. For marine mammal observations with a single observer, depending on the weather conditions and safety requirements for the crew the MMSO will position themselves in the middle of the ship at the front (bow) to observe marine mammal on both the starboard and the port side (Figure 2).

#### Observation Period

MMSO observation periods (marine mammal and seabird observations) should last approximately 1.5 hours but not last longer than 2 hours to mitigate observer fatigue and eyestrain.

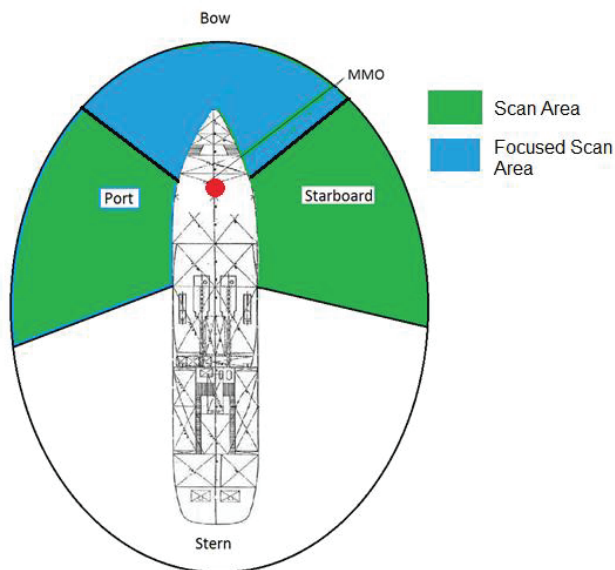


Figure 2. MMSO position and respective observation field on a hypothetical ship

### 2.1.3.1 Scan Routine

The following scan routine should be conducted throughout the marine mammal observation period. Scan the water with the naked eye and use binoculars only to focus on possible sightings. Perform S and U scans of the observation field about every 20 seconds (Figure 3). The most important aspect of marine mammal observing is to constantly scan the observation field to capture animals that could be located in the peripheral view for brief moments (e.g., surfacing). Scans should be made from the middle of the vessel (for one MMSO) and cover the scan area shown in Figure 2 with a focus on the water ahead and to the side to the moving vessel (e.g., focused scan area in Figure 2). If the vessel is stationary (e.g., anchored) scans should be conducted over the entire scan area (e.g., blue and green in Figure 2) in a uniform fashion. When the vessel is stationary, less priority can be attributed to marine mammal observations.



Figure 3: S & U scanning techniques

All marine mammals observed during the dedicated marine mammal observational periods as well as incidental sightings will be recorded including GPS location, distance to animal, angle to animal, number of individuals, species, behaviour etc. If a species is unknown or if a blow is the only detection of the animal observed, then mark the sighting as unknown. Marine mammals in large groups that are close together should be marked as a single sighting. When possible, photographs of marine mammal sightings will be taken and recorded alongside sightings records. Incidental sightings should be recorded on the *Incidental Marine Wildlife Sightings Form* (Attachment C).

Angle to a marine mammal or group of marine mammal can be calculated using a Pelorus or by estimating the angle with an angle board. Figure 4 shows how an angle to a marine mammal from the vessel should be estimated.

On-effort sightings should be recorded by the MMSO only, with no assistance permitted by other crew members. Sightings of pinnipeds hauled-out on land will be recorded as off-effort sightings. Bow-riding dolphins or porpoises are also not recorded as on-effort sightings unless they are observed prior to their initial approach to the vessel (as it was assumed that the sighting of a bow-riding cetacean was not random but rather influenced by the presence of the vessel). Bow-riding dolphins or porpoises are recorded as incidental (off-effort) sightings.

All efforts will be made to avoid double counting individuals or groups of individuals. If a marine mammal is counted twice in the sightings record, then a note of a re-sighting should be marked.

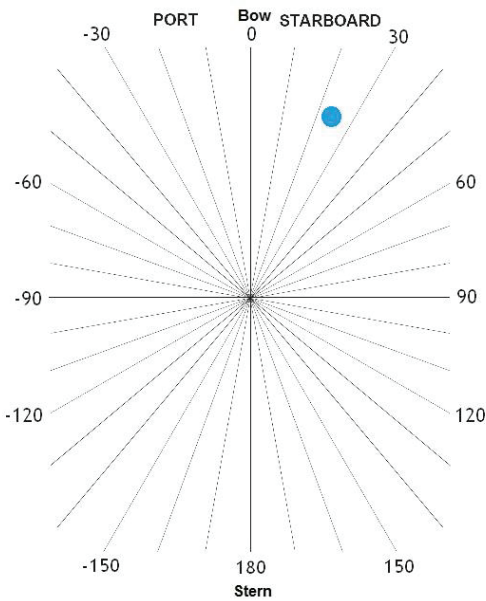


Figure 4. Angle to Marine Mammal (blue dot) is approximately 22°

**2.1.3.2 Scan Routine**

Record the distance to each marine mammal or group of marine mammal (to the center of the group). For all marine mammals, estimate the angular distance between the marine mammal(s) and the observer.

**Using Reticle binoculars**

Reticle binoculars have a built in scale called a reticle. Estimating distances to marine mammals using reticles is based upon the distance to the horizon which is dependent on:

- the height of the observer eye above sea level in meters; and
- radians per reticle mark for the type of binoculars.

The height of the eye includes the height of the platform above the surface of the water. The number of radians (usually milliradians<sup>3</sup>) will depend on the type of reticles binoculars that are used. The number of radians per reticle mark can be used to produce a distance table based on an equation provided by the binocular manufacture. An example of an equation provided by Fujinon 2006 is:

$$\text{Distance} = (\text{eye height} + \text{height above sea level in meters}) \times 1000 / \# \text{ of milliradians}$$

Reticle binoculars cannot be used to estimate distance if the horizon is obscured (by fog or land), or if they are used from a different height above sea level. Their use becomes minimal in nearshore waters.

---

<sup>3</sup> unit of angular measurement

#### 2.1.4 Seabird Survey Protocol

Seabird survey will be conducted on the shipping route. The protocols laid out below were extracted and adapted from the CWS standardized protocol for pelagic seabird surveys from moving and stationary platforms (Gjerdrum et al. 2012).

##### Observer Position

Observations should be done from a high location on the vessel, when possible, at a location as close to the edge of the platform as possible to increase the detection of seabirds, especially for individuals that use the waters at the base of the vessel. All surveys should be conducted at the same location each time.

##### 2.1.4.1 Survey Protocol – Moving Vessel

General environmental and bird sightings information is to be collected and recorded by filling out the form in Attachment B.

##### Transect Methods

During transect surveys, the observer is to look forward from the vessel, scanning at a 90° angle from either the port (left) or starboard (right) side depending where he or she is located. The transect width within seabirds are recorded is 300 m from the side of the vessel (see Figure 5). Scan ahead regularly (e.g., every minute) to spot birds that may dive as the vessel approaches.

All birds observed within this 300 m transect, whether flying or on the water, are recorded and are considered in-transect sightings. The methods for recording birds on the water verses birds in flight are outlined below. All five-minute surveys should begin with a snapshot survey to capture flying birds. The perpendicular distance from the line to the seabirds detected on the water or in flight is estimated for each sighting. Birds observed outside the 300 m transect are also recorded if this does not affect observations within the 300 m transect. Distance categories “E” and “T” in Figure 5 are both considered not in transect. Binoculars and spotting scopes can be used to confirm species identification and other details as necessary.

##### Observation Period

Each seabird survey period will be conducted during six consecutive five-minute periods which is repeated three times a day to capture morning, afternoon and evening periods when possible. These five-minute surveys should be dedicated to surveying for seabirds only. These surveys should be completed regardless if birds are present or not. If the vessel is not moving (stationary), use the method for stationary vessel described in Section 2.1.4.2 below.

Short breaks should be taken at the end of each five-minute period to record the vessel’s position and any conditions that may have changed since the last five-minute survey period. If ship speed or direction changes significantly during the survey period, record the time and location (GPS), cease the current survey and begin a new five minute survey period.

The frequency of the seabird surveys has been selected to provide time for the MMSO to:

- have dedicated seabird and marine mammal observation periods (as described above);
- conduct daily shipping-related activities if the MMSO is part of the ship's crew;
- take necessary breaks to avoid observer fatigue; and
- conduct daily reporting.

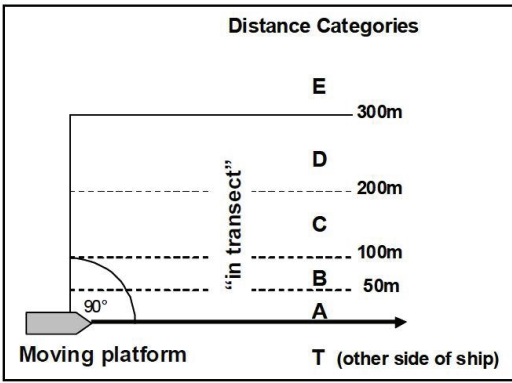


Figure 5. Illustration of a survey using a 90° scan, covering a 300 m transect from a moving platform (extracted from Gjerdrum et al. 2012)

### Birds on the Water

All birds observed on the water are continuously recorded throughout the five-minute survey period. If birds in the transect fly off the surface of the water as the vessel approaches, use binoculars to help count them, and record these birds as being on the water as outlined in the seabird survey sighting form (Attachment B). These birds are not subsequently counted as a flying bird during a snapshot survey (described below for flying bird).

Birds on the water may be observed up ahead of the platform, perhaps as far as 400 m or 500 m, but still within the 300 m transect (Figure 5). Because these individuals may dive or fly away as a result of the approaching ship, they should be counted as in transect and their perpendicular distance recorded when they are first observed. If the five-minute survey will end before the ship reaches them, they should be recorded in the next five-minute survey period.

### Birds in Flight – Snapshot method

All five minute surveys should begin with a snapshot of flying birds. Flying birds are not recorded continuously throughout the five-minute survey period as with birds on the water, as this would overestimate bird density. Create a routine of snapshot counts to record flying birds during the survey period. Only use the snapshot method when there are many birds observed flying in the area. The number of snapshots done will depend on the speed of the vessel (Table 1).

During each snapshot, record flying birds as in transect if they are flying above the 300 m transect. Record all other flying birds that are seen outside of the 300 m transect or between snapshot intervals as not in transect.



Some species may fly in long lines across the 300 m survey transect. At the time of the snapshot, the number of birds in the flock is recorded and the distance class is assigned according to the location of the center of the flock. All the birds in the flock are recorded as in transect if the center is within the 300 m transect. If the center of the flock is outside the 300 m transect, all birds are recorded as not in transect.

### Large Groups of Birds

When very large numbers of birds are encountered that overwhelm the observer's ability to count the number of birds and measure the distance to flocks the snapshot method can be used to count all birds in flight and on the water. If this protocol is used, note the change in protocol on the seabird survey sighting form (Attachment B). If it is not practical to estimate distance to each bird or flock of birds, the observer should at least indicate whether the birds were observed in or out of transect. If it is not practical to note which birds are on the water and which are in flight use the following guidelines:

- If the majority of the birds are in the air, they can be recorded as flying.
- If birds appear first on the water and then fly away as the vessel approached, or they continuously move between the water and air, recorded them being as on the water.

### Birds that follow the Vessel

To avoid double counting birds, once a bird is recorded in-flight it is not subsequently recorded again if it follows the ship and it is not recorded on subsequent snapshots. If many birds are following the vessel and it becomes difficult to determine which individuals have already been recorded, the number of birds following the ship can be estimated and recorded at regular intervals (i.e., in between each five minute survey or as possible).

**Table 1: Intervals at Which Instantaneous or "Snapshot" Counts of Flying Birds Should be conducted during a Moving Vessel Survey**

Platform Speed (knots)	Interval Between Counts (minutes)
<4.5	2.5
4.5 – 5.5	2.0
5.5 – 8.5	1.5
8.5 – 12.5	1.0
12.5 - 19	0.5

### Poor Visibility

When a survey period cannot be done because of poor visibility (i.e., when the entire width of the 300 m transect is not visible), the extent of visibility should be noted on the seabird survey information form.

### Observation Periods with No Birds

If no birds are observed during a five-minute survey period, "no seabirds observed" must be noted on the seabird survey information form.

### 2.1.4.1 Survey Protocol – Stationary Vessel

#### Scan Method

Surveys while the vessel is stationary (e.g., on standby or anchored) are done using instantaneous counts, or “snapshots” of birds within a 300 m “semi-circle” area from the vessel. These surveys are conducted by scanning through a 180° arc, limiting observations to a semi-circle around the observer (Figure 6).

The area should be scanned from one side to the other, and all seabirds on water and in flight that are observed within 300 m are systematically recorded. Birds visible beyond 300 m are also, if possible. The distance to seabirds (inside and outside the 300 m area) from the observer is estimated and recorded for all birds. Birds observed outside the 300 m semi-circle are recorded as not in semi-circle on the seabird survey information form. Binoculars and spotting scopes can be used to confirm species identification and other details as necessary.

#### Observation Period

When the vessel is stationary, less priority can be attributed to marine mammal observations. The length of each scan will depend on the number of birds present at the time of the scan (e.g., it may only last a few seconds if there are no birds present).

#### Poor Visibility

When an observation period cannot be done because of poor visibility (i.e., when the entire width of the 300 m transect is not visible), the extent of visibility should be noted on the seabird survey information form.

#### Observation Periods with No Birds

If no birds are observed during a five-minute survey period, “no seabirds observed” must be noted on the seabird survey information form.

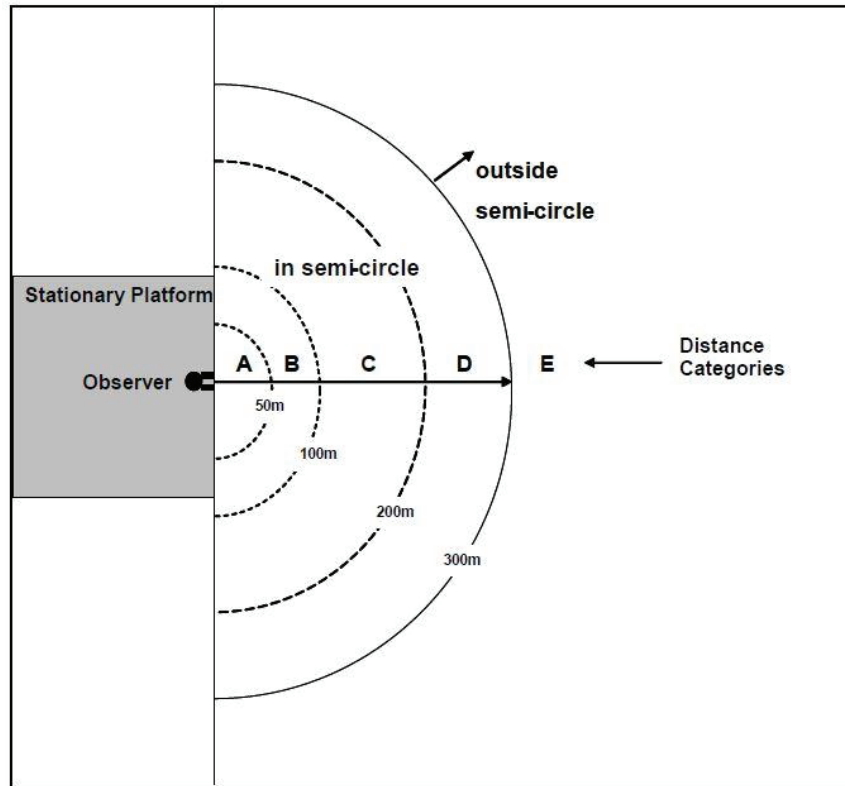


Figure 6. Survey using an 180o scan, surveying an area 300 m from a stationary observer (Extracted from Gjerdrum et al. 2012)

#### 2.1.4.1 Estimating Distance

Record the distance to each bird or flock of birds (to the center of the flock). For all birds, estimate the perpendicular distance between the bird(s) and the observer (Figure 6). If a group of birds is straddling the 300 m boundary with the flock center located in D (some individuals inside and some individuals outside the transect) record the entire flock as being in D. If the flock center is outside the transect, record the entire flock as distance class E. It is very important to record distance to birds within the 300 m strip, but if this is not possible (i.e., too busy), you may use the code 3 = within 300 m but no distance recorded. Distance T is used to indicate that the bird or flock was observed on the opposite side of the vessel.

#### 2.1.5 Recording Observations

General environmental and marine mammal sightings information is to be collected and recorded by filling out the Incidental Marine Wildlife Sightings Form in Attachment C.

MMSO's will record any responsive actions undertaken by the vessel crew in response to sightings. This will be recorded on a daily basis as outlined in the MMSO daily reporting template provided in Attachment C. All records of vessel strikes on marine mammals and bird collisions will be provided to Fisheries and Oceans Canada (DFO) and CWS on a weekly basis, as vessel communications allow (i.e., as internet connections allow). Immediate reporting will be required in the event that a ship strike occurs on a marine

mammal, or multiple bird collisions occur (involving more than five individuals) and the incidents appear related (i.e., similar time period, location, and weather conditions). In this instance, the regional Environment and Climate Change Canada (ECCC) Wildlife Enforcement Officer (contact information provided below) will be contacted to provide advice on the implementation of adaptive management techniques to attempt to reduce the likelihood of collisions occurring in the future. If bridge crew determine a ship strike of seabirds has occurred, they will complete the MSSO Incident Report Form (Attachment C).

*Attachment A*

Marine Mammal Sightings Form

**Marine Mammal Sightings Form** (circle options that are *italicized* as appropriate)

General Information														
Date (DD/MM/YYYY)				Observer Name				Height of Eye (m)						
Vessel Information														
Company/Agency				Vessel Type				Vessel Heading (compass)						
Vessel Name				Vessel Activity	<input type="checkbox"/> <i>Moving</i> <input type="checkbox"/> <i>Stationary</i>			Vessel Speed (kt)						
Environmental Information														
Weather	<input type="checkbox"/> <i>Clear</i> <input type="checkbox"/> <i>Partly Cloudy</i> <input type="checkbox"/> <i>100% Cloud</i> <input type="checkbox"/> <i>Fog</i> <input type="checkbox"/> <i>Rain</i> <input type="checkbox"/> <i>Snow</i>							Sea State (0-9)						
Beaufort Wind Force	<input type="checkbox"/> <i>Calm</i> <input type="checkbox"/> <i>Light Wind</i> <input type="checkbox"/> <i>Strong Wind</i> <input type="checkbox"/> <i>Gale Force Wind</i> <input type="checkbox"/> <i>Stormy</i>							Wave Height (m)						
Wind Direction (deg.)				Glare Conditions	<input type="checkbox"/> <i>None</i> <input type="checkbox"/> <i>Slight Grey</i> <input type="checkbox"/> <i>Bright</i>			Visibility (km)						
Survey Information														
Transect Start	Local Time (24 hr)			Latitude (DD)				Longitude (DD)						
Transect End	Local Time (24 hr)			Latitude (DD)				Longitude (DD)						
Observer Location	<input type="checkbox"/> <i>Outdoors</i> <input type="checkbox"/> <i>Indoors</i>		Observation Side	<input type="checkbox"/> <i>Starboard</i> <input type="checkbox"/> <i>Port</i>		<input type="checkbox"/> <i>Bow</i>								
Notes														
Marine Mammal Sighting Information														
Time of Sighting	Distance to Sighting (m)	Angle to Sighting (deg.)	Sighting Coordinates			Species	Count	Age (Adult/Young)	Sex (M/F/UNK)	Re-Sighting (Y/N)	Behaviour (Travel, Feeding, Other)	Mitigation Required?	Photo Number	Comments/Notes
			WPT	Latitude (DD)	Longitude (DD)									

Species	How Animal Was Spotted	Certainty of ID	Animal Activity
Narwhal Whale	By Eye	Definite	Slow Swimming
Beluga Whale	Reticle Binoculars	Probable	Medium Swimming
Bowhead Whale	Big-eye Binoculars	Possible	Fast Swimming
Atlantic Walrus			Looking – Seals
Bearded Seal			Feeding
Ringed Seal			Flipper Slapping
Harbour Seal			Surfacing
Hooded Seal			Resting
Harp Seal			Diving
Polar Bear			Diving (Fluke Visible)
Killer Whale			Splashing
			Surfacing
			Fluking
			Lobtailing
			Bow Riding
			Wake Riding
	Porpoising		
	Spyhopping		
	Breaching		
	Acrobatic		
	Startle Response		
	Milling		
	Unknown		

*Attachment B*

Seabird Sightings Form

Appendix I - Estimating Distance Categories Using Ruler Gauge

Appendix II Through VI - Codes for General Weather Conditions and Glare, Sea State and Beaufort Wind Force, Ice Conditions, Species Codes for Eastern Seabirds, and Codes for Associations and Behaviours



## Seabird Sightings Form (circle options that are *italicized* as appropriate)

Survey Type (circle one):		<i>Moving Vessel</i>		<i>Stationary Vessel</i>					
<b>General Information</b>									
Date (DD/MMM/YYYY)		Observer Name		Height of Eye (m)					
<b>Vessel Information</b>									
Company/Agency		Vessel Type		Vessel Heading					
Vessel Name		Vessel Activity	<i>Moving</i> <i>Stationary</i>	Vessel Speed (kt)					
<b>Environmental Information</b>									
Weather	<i>Clear</i> <i>Partly Cloudy</i> <i>100% Cloud</i> <i>Fog</i> <i>Rain</i> <i>Snow</i>	Sea State (0-9)							
Beaufort Wind Force	<i>Calm</i> <i>Light Wind</i> <i>Strong Wind</i> <i>Gale Force Wind</i> <i>Stormy</i>	Wave Height (m)							
Wind Direction (Deg)		Glare Conditions	<i>None</i> <i>Slight Grey</i> <i>Bright</i>	Visibility (km)					
<b>Survey Information</b>									
Transect Start	Local Time (24 hr)		Latitude (DD)		Longitude (DD)				
Transect End	Local Time (24 hr)		Latitude (DD)		Longitude (DD)				
Survey Number (x of 6)									
Observer Location	<i>Outdoors</i>	<i>Indoors</i>	Observation Side	<i>Starboard</i>	<i>Port</i>				
Notes:									
<b>Seabird Sighting Information</b>									
Species	Count	Observation Type (Fly or Water)	In Transect (Y/N)	Distance (m)	Behaviour (escape flight, rafting, other)	Flight Direction (Deg)	Age (Adult/Young)	Plumage (breeding/non-breeding/molt)	Comments*

\*Indicate in Comments if observation of flying birds was during a "snapshot survey".

## APPENDIX I. Estimating distance categories

The various distance categories can be estimated using the following equation<sup>1</sup>:

$$d_h = 1000 \frac{(ah3838\sqrt{h}) - ahd}{h^2 + 3838d\sqrt{h}} \quad \text{e.g. if } a = 0.730 \text{ m, } h = 12.5 \text{ m, and } d = 300 \text{ m}$$

then  $d_h = 30.0 \text{ mm}$

where:

$d_h$  = distance below horizon (mm)

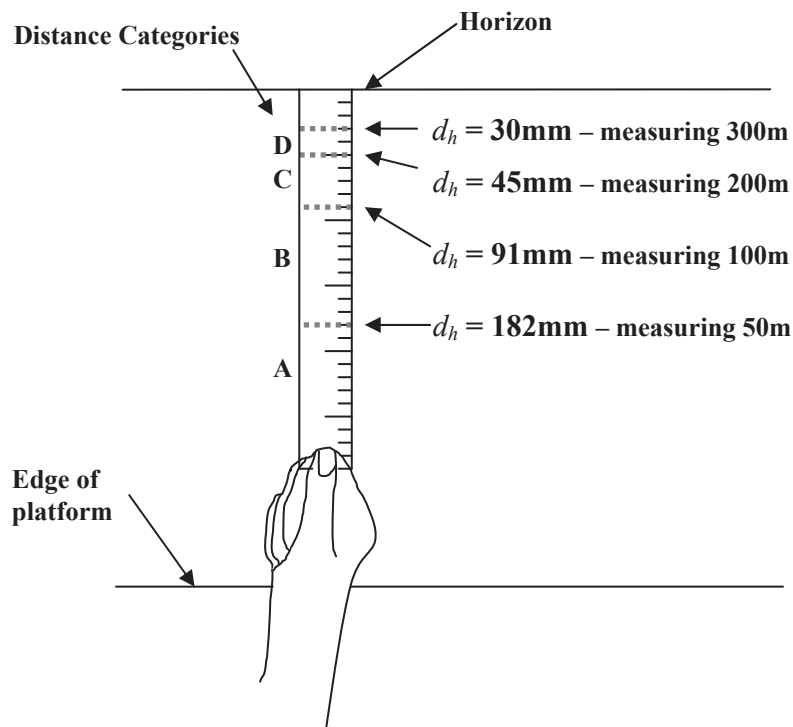
$a$  = distance between the observer's eye and the ruler when observer's arm is fully out-stretched (m)

$h$  = height of the observer's eye above the water at the observation point (m)

$d$  = distance to be estimated (m; a separate calculation is required for each of 50, 100, 200, 300)

Distances are easily estimated using a gauge made from a transparent plastic ruler. A different ruler will be required for each combination of observer arm length ( $a$ ) and platform height ( $h$ ). Calculate  $d_h$  for the boundary of each distance class (A, B, C, D) and mark them on the ruler (dashed lines in figure). To use the gauge, extend the arm fully and keep the top end of the ruler aligned with the horizon. The dashed lines now demarcate the distance class boundaries on the ocean surface. Keep the gauge nearby during surveys to quickly verify bird distances.

Measurements for an observer with  $a = 73 \text{ cm}$  and  $h = 12.5 \text{ m}$ :



<sup>1</sup> Formula derived by J. Chardine, based on Heinemann 1981. A spreadsheet is available from the corresponding author to perform this calculation.

## APPENDIX II. Codes for general weather conditions and glare

---

Code	Description	Explanation
<i>Weather conditions</i>		
0		< 50% cloud cover (with no fog, rain, or snow)
1		> 50% cloud cover (with no fog, rain, or snow)
2		patchy fog
3		solid fog
4		mist/light rain
5		medium to heavy rain
6		fog and rain
7		snow
<i>Glare conditions</i>		
0		none
1		slight/grey
2		bright on the observer's side of vessel
3		bright and forward of vessel

---

**APPENDIX III. Codes for sea state and Beaufort wind force**

<b>Wind Speed (knots)</b>	<b>Sea state code and description</b>	<b>Beaufort wind force and description</b>
<b>0</b>	<b>0</b> Calm, mirror-like	<b>0</b> calm
<b>01 – 03</b>	<b>0</b> Ripples with appearance of scales but crests do not foam	<b>1</b> light air
<b>04 – 06</b>	<b>1</b> Small wavelets, short but pronounced; crests do not break	<b>2</b> light breeze
<b>07 – 10</b>	<b>2</b> Large wavelets, crests begin to break; foam of glassy appearance; perhaps scattered white caps	<b>3</b> gentle breeze
<b>11 – 16</b>	<b>3</b> Small waves, becoming longer; fairly frequent white caps	<b>4</b> moderate breeze
<b>17 – 21</b>	<b>4</b> Moderate waves with more pronounced form; many white caps; chance of some spray	<b>5</b> fresh breeze
<b>22 – 27</b>	<b>5</b> Large waves formed; white foam crests more extensive; probably some spray	<b>6</b> strong breeze
<b>28 – 33</b>	<b>6</b> Sea heaps up; white foam from breaking waves blows in streaks in direction of wind	<b>7</b> near gale
<b>34 – 40</b>	<b>6</b> Moderately high long waves; edge crests break into spindrift; foam blown in well-marked streaks in direction of wind	<b>8</b> gale
<b>41 – 47</b>	<b>6</b> High waves; dense streaks of foam in direction of wind; crests of waves topple and roll over; spray may affect visibility	<b>9</b> strong gale
<b>48 – 55</b>	<b>7</b> Very high waves with long overhanging crests; dense foam streaks blown in direction of wind; surface of sea has a white appearance; tumbling of sea is heavy; visibility affected	<b>10</b> storm
<b>56 - 63</b>	<b>8</b> Exceptionally high waves; sea is completely covered with white patches of foam blown in direction of wind; edges blown into froth; visibility affected	<b>11</b> violent storm
<b>64 +</b>	<b>9</b> Air filled with foam and spray; sea completely white with driving spray; visibility seriously affected	<b>12</b> hurricane







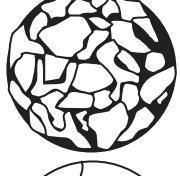
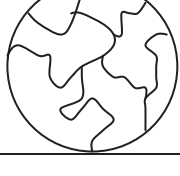
## APPENDIX IV. Codes for ice conditions

Adapted from NOAA: Observers Guide to Sea Ice

### *Sea Ice Forms*

Code	Name	Description
0	New	small, thin, newly formed, dinner plate-sized pieces
1	Pancake	rounded floes 30 cm - 3 m across with ridged rims
2	Brash	broken pieces < 2 m across
3	Ice Cake	level piece 2 - 20 m across
4	Small Floe	level piece 20 - 100 m across
5	Medium Floe	level piece 100 - 500 m across
6	Big Floe	level, continuous piece 500 m - 2 km across
7	Vast Floe	level, continuous piece 2 - 10 km across
8	Giant Floe	level, continuous piece > 10 km across
9	Strip	a linear accumulation of sea ice < 1 km wide
10	Belt	a linear accumulation of sea ice from 1 km to over 100 km wide
11	Beach Ice or Stamakhas	irregular, sediment-laden blocks that are grounded on tidelands, repeatedly submerged, and floated free by spring tides
12	Fast Ice	ice formed and remaining attached to shore

### *Sea Ice Concentration*

Code	Concentration	Description	
0	< one tenth	"open water"	
1	two-three tenths	"very open drift"	
2	four tenths	"open drift"	
3	five tenths	"open drift"	
4	six tenths	"open drift"	
5	seven to eight tenths	"close pack"	
6	nine tenths	"very close pack"	
7	ten tenths	"compact"	

## APPENDIX V. Species codes for birds seen in Eastern Canada

Common name	Species code	Latin name
<b>COMMON, REGULAR OR FREQUENTLY SEEN SPECIES</b>		
Northern Fulmar	NOFU	<i>Fulmarus glacialis</i>
Great Shearwater	GRSH	<i>Puffinus gravis</i>
Manx Shearwater	MASH	<i>Puffinus puffinus</i>
Sooty Shearwater	SOSH	<i>Puffinus griseus</i>
Wilson's Storm-Petrel	WISP	<i>Oceanites oceanicus</i>
Leach's Storm-Petrel	LESP	<i>Oceanodroma leucorhoa</i>
Northern Gannet	NOGA	<i>Morus bassanus</i>
Red Phalarope	REPH	<i>Phalaropus fulicaria</i>
Red-necked Phalarope	RNPH	<i>Phalaropus lobatus</i>
Long-tailed Jaeger	LTJA	<i>Stercorarius longicaudus</i>
Parasitic Jaeger	PAJA	<i>Stercorarius parasiticus</i>
Pomarine Jaeger	POJA	<i>Stercorarius pomarinus</i>
Great Skua	GRSK	<i>Stercorarius skua</i>
Herring Gull	HERG	<i>Larus argentatus</i>
Iceland Gull	ICGU	<i>Larus glaucoides</i>
Glaucous Gull	GLGU	<i>Larus hyperboreus</i>
Great Black-backed Gull	GBBG	<i>Larus marinus</i>
Black-legged Kittiwake	BLKI	<i>Rissa tridactyla</i>
Common Murre	COMU	<i>Uria aalge</i>
Thick-billed Murre	TBMU	<i>Uria lomvia</i>
Razorbill	RAZO	<i>Alca torda</i>
Dovekie	DOVE	<i>Alle alle</i>
Atlantic Puffin	ATPU	<i>Fratercula arctica</i>
<b>SPECIES MORE COMMONLY SEEN INSHORE</b>		
Common Loon	COLO	<i>Gavia immer</i>
Red-throated Loon	RTLO	<i>Gavia stellata</i>
Red-necked Grebe	RNGR	<i>Podiceps grisegena</i>
Horned Grebe	HOGR	<i>Podiceps auritus</i>
Great Cormorant	GRCO	<i>Phalacrocorax carbo</i>
Double-crested Cormorant	DCCO	<i>Phalacrocorax auritus</i>
Greater Scaup	GRSC	<i>Aythya marila</i>
Common Eider	COEI	<i>Somateria mollissima</i>
Harlequin Duck	HARD	<i>Histrionicus histrionicus</i>
Long-tailed Duck	LTDU	<i>Clangula hyemalis</i>
Surf Scoter	SUSC	<i>Melanitta perspicillata</i>
Black Scoter	BLSC	<i>Melanitta nigra</i>
White-winged Scoter	WWSC	<i>Melanitta fusca</i>
Red-breasted Merganser	RBME	<i>Mergus serrator</i>
Black Guillemot	BLGU	<i>Cephus grylle</i>

Common name	Species code	Latin name
-------------	--------------	------------

**INFREQUENTLY OR RARELY SEEN SPECIES**

Cory's Shearwater	COSH	<i>Calonectris diomedea</i>
Audubon's Shearwater	AUSH	<i>Puffinus lherminieri</i>
Lesser Scaup	LESC	<i>Aythya affinis</i>
King Eider	KIEI	<i>Somateria spectabilis</i>
South Polar Skua	SPSK	<i>Stercorarius maccormicki</i>
Bonaparte's Gull	BOGU	<i>Larus philadelphia</i>
Ivory Gull	IVGU	<i>Pagophila eburnea</i>
Black-headed Gull	BHGU	<i>Larus ridibundus</i>
Laughing Gull	LAGU	<i>Larus articilla</i>
Ring-billed Gull	RBGU	<i>Larus delawarensis</i>
Lesser Black-backed Gull	LBBG	<i>Larus fuscus</i>
Sabine's Gull	SAGU	<i>Xema sabini</i>
Common Tern	COTE	<i>Sterna hirundo</i>
Arctic Tern	ARTE	<i>Sterna paradisaea</i>
Roseate Tern	ROTE	<i>Sterna dougallii</i>

**CODES FOR BIRDS IDENTIFIED TO FAMILY OR GENUS**

Unknown Bird	UNKN	
Unknown Shearwater	UNSH	<i>Puffinus</i> or <i>Calonectris</i>
Unknown Storm-Petrel	UNSP	Hydrobatidae
Unknown Duck	UNDU	Anatidae
Unknown Eider	UNEI	<i>Somateria</i>
Unknown Phalarope	UNPH	<i>Phalaropus</i>
Unknown Jaeger	UNJA	<i>Stercorarius</i>
Unknown Skua	UNSK	<i>Stercorarius</i>
Unknown Gull	UNGU	Laridae
Unknown Tern	UNTE	<i>Sternidae</i>
Unknown Alcid	ALCI	Alcidae
Unknown Murre or Razorbill	MURA	<i>Uria</i> or <i>Alca</i>
Unknown Murre	UNMU	<i>Uria</i>



## APPENDIX VI. Codes for associations and behaviours

From Camphuysen and Garthe (2004). Choose one or more as applicable.

---

<b>Code</b>	<b>Description</b>
<i>Association</i>	
10	Associated with fish shoal
11	Associated with cetaceans
13	Associated with front (often indicated by distinct lines separating two water masses or concentrations of flotsam)
14	Sitting on or near floating wood
15	Associated with floating litter (includes plastic bags, balloons, or any garbage from human source)
16	Associated with oil slick
17	Associated with sea weed
18	Associated with observation platform
19	Sitting on observation platform
20	Approaching observation platform
21	Associated with other vessel (excluding fishing vessel; see code 26)
22	Associated with or on a buoy
23	Associated with offshore platform
24	Sitting on offshore platform
26	Associated with fishing vessel
27	Associated with or on sea ice
28	Associated with land (e.g., colony)
50	Associated with other species feeding in same location

---

<b>Code</b>	<b>Description</b>	<b>Explanation</b>
<i>Foraging behaviour</i>		
30	Holding or carrying fish	carrying fish towards colony
32	Feeding young at sea	adult presenting prey to attended chicks (e.g., auks) or juveniles (e.g., terns)
33	Feeding	method unspecified (see behaviour codes 39,40,41,45)
36	Aerial pursuit	kleptoparasitizing in the air
39	Pattering	low flight over the water, tapping the surface with feet while still airborne (e.g., storm-petrels)
40	Scavenging	swimming at the surface, handling carrion
41	Scavenging at fishing vessel	foraging at fishing vessel, deploying any method to obtain discarded fish and offal; storm-petrels in the wake of trawlers picking up small morsels should be excluded
44	Surface pecking	swimming birds pecking at small prey (e.g., fulmar, phalaropes, skuas, gulls)
45	Deep plunging	aerial seabirds diving under water (e.g., gannets, terns, shearwaters)
49	Actively searching	persistently circling aerial seabirds (usually peering down), or swimming birds frequently peering (and undisturbed by observation platform) underwater for prey
<i>General behaviour</i>		
60	Resting or apparently sleeping	reserved for sleeping seabirds at sea
64	Carrying nest material	flying with seaweed or other material; not to be confused with entangled birds
65	Guarding chick	reserved for auks attending recently fledged chicks at sea
66	Preening or bathing	birds actively preening feathers or bathing
<i>Distress or mortality</i>		
71	Escape from ship (by flying)	escaping from approaching observation platform
90	Under attack by kleptoparasite	bird under attack by kleptoparasite in an aerial pursuit, or when handling prey at the surface
93	Escape from ship (by diving)	escaping from approaching observation platform
95	Injured	birds with clear injuries such as broken wings or bleeding wounds
96	Entangled in fishing gear or rope	birds entangled with rope, line, netting or other material (even if still able to fly or swim)
97	Oiled	birds contaminated with oil
98	Sick/unwell	weakened individuals not behaving as normal, healthy birds, but without obvious injuries
99	Dead	bird is dead

*Attachment C*

MMSO Daily Reporting Template

MSSO Incident Report Form

Incidental Marine Wildlife Sightings Form

**1.0 MARINE MAMMALS AND SEABIRD OBSERVING (MMSO) DAILY REPORT****Project Information**

Client:

Date:

Project Name:

Location:

**Ship Contractor Information**

Ship Contractor Name:

Site Supervisor or Captain:

Ship Name/Type:

MMSO name:

General weather conditions (throughout the day)

Cloud cover:

Precipitation:

Wind (knots):

Sea state:

Swell height:

Air temperature:

Ice presence:

Notes:

Time start/Time end MMSO duties (UTC):

**2.0 MITIGATION LOG**

Mitigation Implemented	Time (UTC)	GPS Location	Rational for Implementation

Under Activity note the following: Description of any vessel mitigation implemented (e.g., reduction in speeds, evasive maneuvers etc.)

**3.0 RECORD OF VESSEL-ANIMAL COLLISIONS/INTERACTIONS**

Species	Number of Individuals	Time (UTC)	GPS Coordinates	Visibility/Sea State	Comments

Extracted from the Meliadine Shipping Management Plan, 2017

**In the comments note the following:** Animals observed on the deck (seabirds) or in the water (seabirds or marine mammals), if search lights or vessel lighting sources were active at the time of collision, and any other relevant notes.

#### 4.0 MMSO CHECKLIST

Item or Location to Check	Yes	No	Comments
			<ul style="list-style-type: none"> <li>- Discussed (D) with relevant Ship personnel</li> <li>- Observed (O)</li> <li>- Not Applicable (NA)</li> <li>- Action required (as/if applicable)</li> </ul>
<b>General</b>			
Copy of SMP and appendices posted on-site			
Orientation to mitigation measures outlined in Section 4.2 of the SMP			
Overview of MMSO duties and protocols (e.g., ship crews should be made aware that the MMSO is the only individual that can mark sightings during the dedicated surveys/observation periods)			
Add additional items as necessary and depending on the role of the MMSO			

**General Notes:**

#### 5.0 SUMMARY OF ISSUES AND RECOMMENDATIONS / ACTIONS

Date Noted	Issue	Recommendation/Action	Completed (Date Resolved)	Comments

Extracted from the Meliadine Shipping Management Plan, 2017

## Marine Mammals and Seabird Observer (MMSO) Incident Report

Project Information		
Client: Agnico Eagle		Date:
Project Name (circle one): <i>Meadowbank</i> <i>Meliadine</i>		General Location:
Vessel Contractor Information		
Vessel Contractor Name:		Site Supervisor or Captain:
Vessel Name/Type:		
MMSO Name:		
General Weather Conditions (throughout the day):	Wind (knots):	
	Sea State:	
	Swell Height (m):	
	Temperature (°C):	
	Notes:	
Time Start/Time End MMSO Duties (HH:MM):	Start:	End:

### Mitigation Log\*

Time (UTC; HH:MM)	Was Mitigation Implemented?	Location		Rationale for Implementation
		Latitude (DD)	Longitude (DD)	

\*Fill in this section if vessel is required to route north of Coats Island due to safety concerns

### Record of Vessel-Animal Collisions/Interactions

Species	Number of Individuals	Time (HH:MM)	Location		Visibility (m)/ Sea State	Comments
			Latitude (DD)	Longitude (DD)		

### Summary of Issues and Recommendations/Actions


Date Noted	Issue	Recommendation/Action	Date Resolved	Comments



AGNICO EAGLE

# Incidental Marine Wildlife Sightings Form

(1 form per observation; PLEASE PRINT; circle options provided in *italics* as appropriate)

General Information			
Vessel Name		Date	
Observer Name		Local Time (24 hr)	
Vessel Information			
Ship Speed (kt)		Ship Heading (compass)	
Latitude (decimal degrees)		Longitude (decimal degrees)	
Environmental Information			
Beaufort Wind Force		Visibility (km)	
Wind Direction			
Observation Information			
Species <sup>1</sup>		ID Reliability	<i>Positive / Probable / Maybe</i>
Distance from vessel when first seen (m)		How close did the animal get to the vessel (m)?	
Number of Individuals	<i>Best Estimate:</i> OR <i>Maximum/Minimum:</i>		
Behaviour	Mammals:	<i>Swimming</i>	<i>Diving</i>
		<i>Dead</i>	<i>Resting on land</i>
	Birds:	<i>Flying</i>	<i>Feeding</i>
		<i>Resting on ocean surface</i>	<i>Resting on land</i>
	<i>Escape Ship - Flying</i>	<i>Escape Ship - Diving</i>	<i>Dead</i>
Other (describe):			
Other notes (e.g., physical descriptions, distinctive behaviours, drawing)		Position & Travel Relative to Ship [draw arrow]	 OR Variable Travel Directions
Was this observation the result of a SHIP STRIKE?	Yes	No	If yes, fill out "MMSO Incident Report"
Mitigation Action Taken			
	Yes	No	
If yes, describe mitigation actions (e.g., change in course or speed) and result (e.g., maintained a buffer of x metres from wildlife)	ACTION: RESULT:		

<sup>1</sup> Refer to list of species in the ID Guides