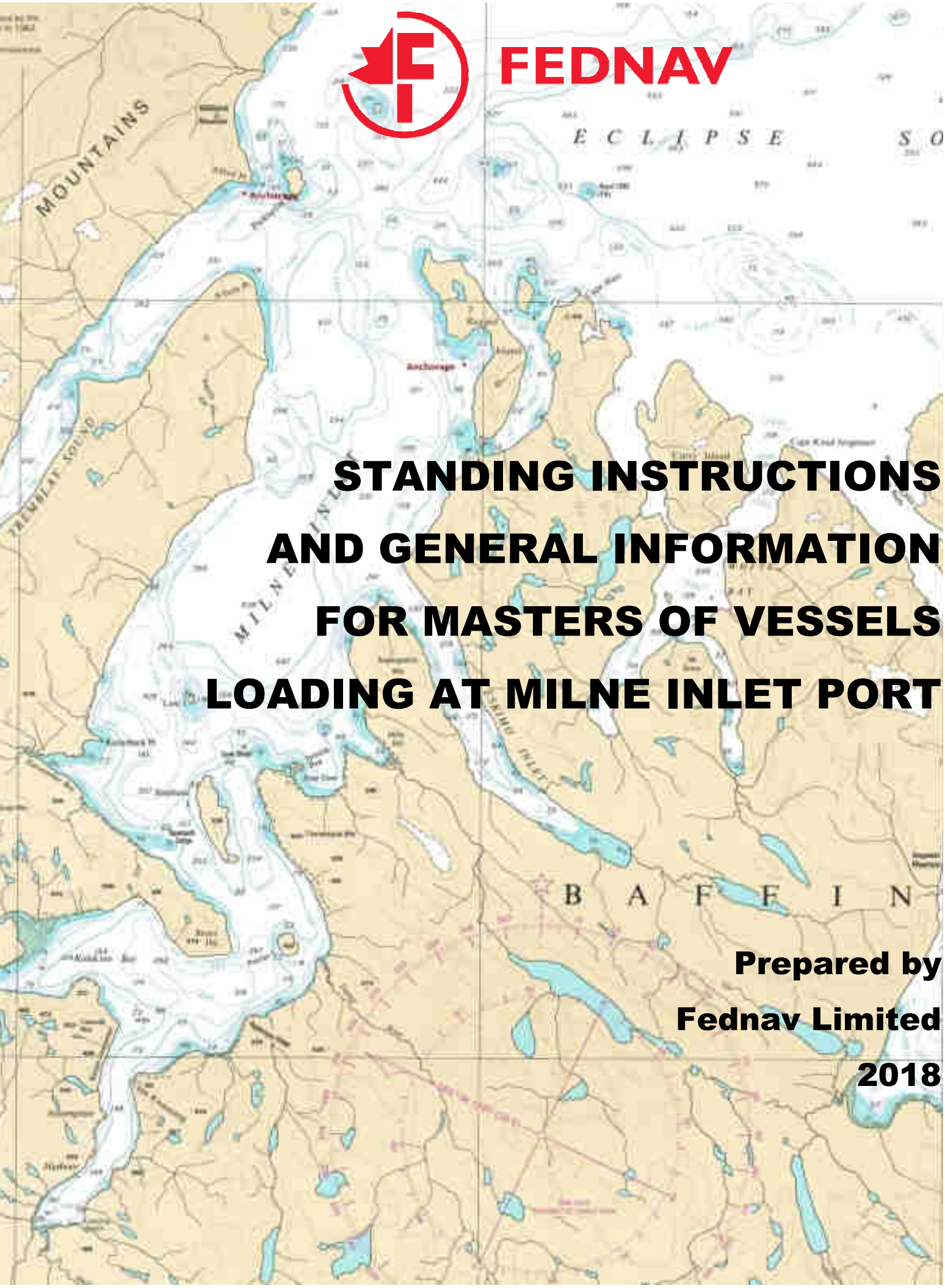


STANDING INSTRUCTIONS AND GENERAL INFORMATION FOR MASTERS OF VESSELS LOADING AT MILNE INLET PORT

Prepared by

Fednav Limited

2018

CONTENTS

INTRODUCTION

This document has been prepared for the guidance of Masters whose vessels have been nominated to load at the Baffinland Iron Mines Corporation, Milne Inlet Port site on Baffin Island. They are to be read in conjunction with (and being subject to) detailed voyage instructions that will be issued by Vessel's Owner or Operator prior to the commencement of the voyage.

All sealift vessels will comply with the Standing Instructions (where applicable). After making contact with the Fednav Port Captain, vessels will be directed to the Sealift Anchorage at Milne Inlet (designated anchorage #3). If this anchorage is occupied, the Port Captain will direct the vessel to an alternative anchorage location or be requested to drift in Eclipse Sound until further orders are given.

The general information given within this document is intended to provide guidance only and nothing contained herein should be read in any way as over-riding the Master's authority and responsibility for safe navigation and management of the vessel, including compliance with the latest revision of all applicable statutes, regulations, and requirements of flag and port states. Furthermore, nothing contained in this document is to be read as varying or waiving any of the terms of the charter governing the vessel's employment by Arcelormittal Shipping Limited – Baffinland. If you believe, for any reason that anything contained in this document is inappropriate for the situation in which you find yourself, or inconsistent with the best interest of the project, you must notify us without delay.

While all reasonable care has been exercised to ensure the accuracy and completeness of such information, its accuracy and completeness is not guaranteed.

Masters should be aware that the parties involved in this operation are:

> **Baffinland Iron Mines Corporation** are the Owners / Operators of the Milne Inlet Port site and are the Shippers of the cargo loaded on the vessels. Mary River Project is the name of the mine site.
>
> **Arcelormittal Shipping Limited** are the operating shareholders in the Baffinland Iron Mines Corporation.
>
> **Fednav Limited and Fednav International** are the providers of the ocean transportation services and contracted to Baffinland Iron Mines Corporation with respect to the management of Port Operations and vessel interface at Milne Inlet.

Loading Area - The Milne Inlet Port site is located on northern Baffinland Island in the Territory of Nunavut. Fednav has been contracted to oversee and manage day to day ship-shore interface at Milne Inlet. For full description of port information, kindly refer to the *Terminal Information Handbook* for Milne Inlet Terminal.

Because of the remote Arctic location of the loading area, it should be considered that virtually no services are available to the vessel (no crew changes, no mail services, no charts available, no bunker services and no fresh water or stores). Master should take this into consideration prior to sailing last port before commencing voyage to Baffinland.

EXPORT CARGO

Cargo to be shipped, iron ore, is more fully described in the attached *Material Safety Data Sheet* (MSDS) and Shipper's Declaration. The cargo is to be loaded in accordance with the provisions of the *Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) and the International Maritime Solid Bulk Cargo (IMSBC) Code.* The Bulk Cargo Shipping Name (BCSN) under the IMSBC Code is: Iron Ore. The iron ore lump cargo is categorized as belonging to IMSBC Code Cargo Group 'C'. The iron ore fines cargo is categorized as belonging to IMSBC Code Cargo Group 'A'.
The iron ore cargo will be shipped in two separate grades:

- Lump Ore representing about 75 % of export tonnage
- Fines representing about 25 % of export tonnage

The typical bulk density of the iron ore cargo is, as follows:

BAFFINLAND IRON ORE - BULK DENSITY (t/m^3)		
	Fines	**Lump**
Minimum	3.0	2.6
Maximum	3.1	2.7
Average	3.05	2.65

For full description of the cargo, kindly refer to the *Transportable Moisture Limit & Moisture Content* sheet at ***Appendix 5 – Documents and Certificates***.

SHIPPING SEASON

The Shipping Season is during the nominal open water season for this zone of the Arctic. Kindly refer to *Zone Date System* in ***Appendix 1 – Ice and Weather Information***. The exact dates for the season are subject to ice conditions in the area, however, it is expected to begin between July 25 and August 1 and end around October 10. Detailed ice information can be found at ***Appendix 1 – Ice and Weather Information***.

REGULATORY REGIME

In every case, it is Owners' responsibility to ensure that vessels engaged in trade to Milne Inlet fully comply with all applicable national and international regulations and with the specific requirements of the trade to Milne Inlet as described in governing charter parties and contracts.

The purpose of this booklet is not to specify how vessels should navigate outside of Milne Inlet and the approaches, this is the responsibility of the Master who is accountable for the safety of the ship and crew as well as the protection of the environment at all times.

Masters shall avail themselves of the best information available from the most up-to-date charts and publications, and advice from Ice Navigators when planning routes, taking into account weather, currents, and ice.

SECTION 1: PRE ARRIVAL INFORMATION

REPORTING REQUIREMENTS

Vessels trading to Milne Inlet from foreign ports will enter Canadian coastal waters and so must report to Canadian authorities as fully described in ***Appendix 3 – Reporting Procedures***. It is a fundamental responsibility of the Owners of all ships trading to Canada to adhere to these regulations.

Commercial Notices to be Given

It is requested that all vessels transmit a notice to vesselinfo@baffinland.com upon departure from the last port en route to Milne Inlet with projected ETA at Milne Inlet.

While en route to Milne Inlet, all vessels are to provide daily updates of their current position and ETA. If the ETA should change by more than six hours in the days leading up to arrival, immediate advice of this change is to be sent to the same address as above.

Once vessels cross 60 degrees north, it is requested to provide updates every 12 hours. Within 24 hours of ETA Milne Inlet, updates are to be sent by email 24 / 12 / 6 hours prior to ETA off the berth.

An up-to-date contact list will be maintained by Baffinland Mines at the Milne Inlet terminal.

- Milne Inlet Port Captain – portcaptain@fednav.com
- Fednav Internal Operators – Baffinland@fednav.com
- Baffinland Iron Mines – vesselinfo@baffinland.com

Ballast Water Exchange

Vessels bound to any Canadian ports must adhere to the latest regulations with regard to the carriage, exchange, and disposal of ballast water. Ballast water exchange reporting information can be found in ***Appendix 3 – Reporting Procedures.***

A salinity test will be performed on all vessels at the Milne Inlet Port site prior to discharging ballast water to ensure that ballast water exchange has occurred. The tank will be selected at random to check for salinity.

Fednav Contact Information Outside of Office Hours

Fednav office hours are from 0900 - 1700 hours, Monday to Friday. Messages addressed to Fednav and arriving after office hours are monitored from time to time. However, you should not assume that after office hour messages are immediately read. In the event of an urgent matter requiring immediate assistance, you should contact Fednav via telephone at the numbers provided below.

- Port Captain (at terminal): 1-416-364-8820. Ext. 4111
- Fednav Agency (24 hours): 514-878-6451

SECTION 2: NAVIGATION

COASTAL NAVIGATION TO AND FROM MILNE INLET

Comments offered in this section are meant to provide guidance only. It is important to note that the navigation of the vessel is at all times the sole responsibility of the Master and nothing contained herein override the Master's responsibility.

All vessels entering Canadian ports, whether Canadian or foreign registered are required to carry a Canadian, Admiralty or US catalogue of charts and the appropriate Canadian, UK or US Charts and marine publications as set out in the *Canadian Charts and Nautical Publications Regulations 1995*.

All navigation charts pertinent to Canadian Waters must be the latest edition and all charts and publications must be corrected up-to-date per the applicable *Notices to Mariners.*

Details of Canadian routes and reporting requirements are set out in the *Canadian Annual Notice to Mariners,* which should be carried onboard.

Prior to entering coastal waters, all vessels as a matter of safe practice should conduct tests of propulsion and steering systems, shall verify the ship's draft, and otherwise confirm that the vessel is suitably prepared for inshore navigation, including, operating a stand-by generator.

NAVIGATING TO MILNE INLET

As to route selection, there are surveyed routes through the coastal waters to Milne Inlet. Milne Inlet Port is located at latitude 71 53' 23'' North, longitude 80 54' 13'' West. Vessels transiting to Milne Inlet will pass along the West Coast of Greenland and through Baffin Bay. Vessel must have onboard the large scale Danish charts for the west coast of Greenland. From there, Milne Inlet can be approached south of Bylot Island through Pond Inlet and Eclipse Sound.

A graphic of the suggested route appears in ***Appendix 4 – Navigation Information***. As noted, the suggested route through Pond Inlet, subject to prevailing ice and weather conditions, is to follow the southern shore of Bylot Island Coast about two miles offshore. While always remaining within well charted and sounded areas, proceed to a point in Eclipse Sound abeam Dufour Point, thereafter following a course midway between two shoals at the entrance to Milne Inlet. Vessel to remain on a course approximately midway between Ragged Island and Athole Point, and remain close to the middle of the inlet, passing east of Stephens Island, then West of Poirier Island. Thereafter, adjust as necessary, remaining close to the middle of Milne Inlet to the port site.

Fednav Port Captain will contact vessel prior to its arrival off the Port with advice as to whether vessel to proceed directly alongside, alternatively, proceed to a safe anchorage near the port.

Note: There is a vessel maximum speed limit of 9 knots over ground (and not through water), beginning at the entrance to Pond Inlet (at 76 degrees longitude) through Eclipse Sound and in Milne Inlet.

Nominally, the area is mostly open water from August to early October. However, mariners must be

cautious at all times, as sea ice remnants of old floes and glacial ice can be encountered at most times of the year and therefore, a good visual, and radar watch should be maintained for their avoidance. For further information on ice conditions, refer to the Coast Guard publication *Ice Navigation in Canadian Waters*, a copy of which should be onboard. In addition to the Coast Guard publication, ***Appendix 1 – Ice and Weather Information*** contains useful information on ice formations in the area.

Anchorage

Listed below are a number of suggested anchorages along the routes to Milne Inlet, and these locations are well indicated on Canadian Chart No. 7212.

- Lat. 72 27.27 North, Long. 080 03.08 West
- Lat. 72 26.72 North, Long. 080 02.47 West
- Lat. 72 25.40 North, Long. 080 03.90 West

A map of anchorage locations is provided in ***Appendix 4 – Navigation Information*****.**

If vessel chooses to drift, please ensure it is north of Ragged Island in Eclipse Sound.

ICE NAVIGATION

Ice Navigators

In order to assist Masters, Fednav will provide an Ice Navigator for each vessel. An Ice Navigator is a qualified Officer who has several years of experience navigating vessels in ice infested waters, Canadian Arctic Waters, and elsewhere. Onboard the chartered ship, his duties are advisory only and his principal responsibility is to provide the Master with advice with regard to the navigation of the vessel into and outward from Milne Inlet, in the areas north of 60 degrees latitude, as well as anywhere sea ice can be present.

It is intended that the Ice Navigator will join each chartered vessel at the last port of discharge, prior to the vessel's departure for Milne Inlet. The Ice Navigator will remain onboard for the duration of the voyage, leaving the vessel after the vessel arrives in the designated discharge port. Among the Ice Navigators duties will be to ensure the chartered vessel is capable of entering and safely operating in Milne Inlet.

After boarding, the Ice Navigator will convene a meeting with all watchkeepers wherein he may wish to discuss various aspects of his role onboard and general information regarding navigating in potential ice. We cannot stress enough the importance of this meeting and the opportunity for all officers to gain further knowledge of navigating in ice. Any questions about ice navigation can be addressed at this time or at any other time during the voyage.

The Ice Navigator shall verify that the vessel has up to date charts and nautical publications required to be onboard in accordance with governing regulations. However, it is important to note that it is Owners' responsibility to ensure the proper charts and publications are onboard. The Ice Navigator will witness the safe and reliable operation of the machinery and familiarize themselves with the maneuverability of the vessel, the change out of ballast, and will report any apparent deficiencies to Fednav International.

The Ice Navigator shall provide the Master with advice on safe navigation in ice covered Canadian waters, coastal navigation and environment protection procedures in Canadian Arctic Waters and loading at Milne Inlet.

Furthermore, an Ice Navigator may among other duties:

- Assist the Master to understand and complete the required environmental procedures,
- Verify that the vessel has the required Canadian Charts and Publications as specified by Canadian Regulations, and that all are of the latest edition and corrected,
- Advise the Master in the navigation of the vessel though ice prone areas en route to Milne Inlet,
- Coach and train the crew as necessary on detecting and avoiding glacial ice features, in a variety of sea and ice conditions,
- Assist the Master in completion of navigation safety and ice entry checklists,
- Assist the Master in establishing communications with ECAREG and/or NORDREG and with the Milne Inlet site personnel,
- Advise/assist the Master in berthing the vessel alongside the Milne Inlet facility in the event the Milne Inlet Port Docking Master cannot attend onboard,
- Act as facilitator between ship and shore loading procedures,
- Assist the Master in cargo, customs and immigration documentation for arrival and sailing from Milne Inlet.

Transiting in Ice Infested Waters

While it is expected that iron ore ships will load during the nominally open water season, it is expected that ice could be present on the approaches to Milne Inlet at any time during the season (especially at the beginning and at the end of the season). The following guidance is therefore offered to Masters of vessels who may be less familiar with certain aspects of navigating in ice.

Kindly note that in the event of ice being present in the approaches to Milne Inlet, the vessel is to be navigated according to the principles defined in the Canadian Ice Regime Shipping Control System. This system is described in Appendix 1 – Ice and Weather Information. The Ice Navigator is conversant with this system and will provide information as to its application.

The Master should also ensure that prior to departure, en route to Milne Inlet, that his vessel is both sea & cargo worthy, this includes the Master satisfying himself that the hatch covers are watertight and, if they are not, then taking steps to rectify any deficiencies. We would suggest that, after conducting water tightness tests, this fact be recorded in the vessel's log book. All equipment is to be in good operating condition, including bow thrusters where fitted, all navigation and communication equipment, mooring lines, etc. Any shortcomings must be rectified before the vessel departs for Milne Inlet. Sufficient bunkers and provisions are to be placed on board, adequate for the voyage as far as the next port of call after Milne Inlet, including a good selection of radio and radar spare parts.

Personnel on board should be in possession of sufficient warm winter clothing suitable for the seasonal temperatures expected to be encountered.

Consideration should be given to changing ballast in the North Atlantic drift/Gulf stream where sea temperatures are higher, thus reducing the risk of any freezing ballast and also to address environmental concerns.

All water tanks should have the "head" taken off when full so as to avoid freezing up of vent and sounding pipes. Preparations/cleaning of cargo holds to take place in temperate latitude whenever possible. Hold preparation may be difficult to accomplish due to possibly freezing temperatures. For the same reasons hold bilge wells and deck water service lines should be emptied/drained and maintained dry if cold weather is forecasted.

On occasion, sounding pipes may freeze which gives rise to difficulties when deballasting, we therefore suggest that the vessel carry a stock of anti-freeze which can be placed in the sounding pipe to clear it in the early stages of freezing. Once temperatures are constantly below -5ºC avoid opening the cargo hatch covers, as this accelerates freezing in topside ballast tanks and sounding pipes.

Use should be made of all available up to date ice and weather reports. Using satellite communications, your vessel will be able to access up-to-date ice and weather information via email. This information is provided by *Enfotec Technical Services Inc*. – a subsidiary of Fednav Limited.

All on board should familiarize themselves with the publications "Ice Navigation in Canadian Waters" (TP5064) latest edition (which the Ice Navigator will have should it not be already available onboard) and "Code of Nautical Procedures and Practices" (T31-34/1985), both of which are required to be on board.

The radio watch receiver is to be in good working order and is to be monitoring HF as there will be occasions when shore radio stations will wish to make contact.

The Officer of the Watch should be reminded that they are to be completely alert and attentive to their duties, including assisting the Ice Navigator in ice detection. The Ice Navigator will rely heavily on the assistance of the Officer of the Watch and the watchman. ***The presence of the Ice Navigator alone is not enough to guarantee safe navigation.***

Bear in mind that the bridge of your vessel is a considerable distance from the bow, and that cranes hamper visibility. With this in mind, lookouts should be posted on the bridge at all times and, when deemed necessary, a lookout issued with a portable radio posted forward to ensure early detection of ice. All officers and crew should be made fully aware of the importance of their reporting of ice to the Master and these orders should be reinforced from time to time.

Whilst voyage time is important, the overriding consideration is the safety of the crew, the vessel, and the cargo.

While there will be onboard an Ice Navigator who is familiar with the conditions you may encounter, the responsibility for the safe prosecution of the voyage rests solely with the vessel's Master.

SECTION 3: MILNE INLET PORT

METEOROLOGICAL INFORMATION

Milne Inlet lies in a sheltered location on the south side of Eclipse Sound. Studies done in preparation for this project indicate the wave conditions at Milne Inlet are relatively calm with a majority of the waves between 0.0 m and 0.1m high. Waves exceeding 0.5 m occur only 8.6% of the time. Winds are less than 5 m/s for nearly 50% of the time, with winds exceeding 15 m/s only 2.6% of the time. The currents near the Milne Inlet dock average around 0.1 m/s with a maximum of 0.3 m/s.

Weather at Milne Inlet:

Month	Jul	Aug	Sept	Oct 1-15	Oct 16-31
Average high °C	11.55	9.25	1.96	-3.34	-6.45
Daily mean °C	7.54	5.92	-0.61	−6.21	-9.38
Average low °C	3.53	2.67	-3.19	−6.55	-12.31
Precipitation mm	30.77	31.75	18.87	13.74	9.4
Snowfall cm	3.8	14.5	17.17	67.8	116.5

PORT REGULATIONS

Milne Inlet Port is an ISPS Certified facility and all ships using the port are required to be certified as meeting the Internationally Regulated Security Standard.

Please note that Milne Inlet Port has an absolute zero tolerance drug and alcohol policy. No alcohol is to be consumed while the vessel is north of 60 degrees latitude and all Masters are advised to ensure the bond is sealed prior to crossing this point.

Other regulations include:

- No shore leave permitted (emergencies excepted)
- No crew changes permitted (emergencies excepted)
- Only authorized Baffinland personnel permitted onboard
- No fishing tolerated in Nunavut waters
- No shore services will be available

PORT OPERATIONS

As mentioned earlier services for the vessel are extremely limited at Milne Inlet. There are no local agents at the port, however Baffinland personnel will assist in the event of any urgent, unpredicted need arising.

Berthing/Mooring Arrangements at Milne Inlet

Vessels will normally berth starboard side to the loading berth. Any deviation from this must be agreed with Milne Inlet Port in advance. The berth provides an alongside water depth of 17.5 meters below chart datum.

We strongly recommend that, prior to arrival; the Master discusses with the Docking Master the method to be adopted in approaching and securing alongside. The Docking Master will have experience with docking operations at Milne Inlet Port and his input will no doubt prove to be very valuable. Various plans should be drawn up depending upon the prevailing wind, current, and ice conditions. Stage a pre-arrival briefing for the officers that will be at the stations on arrival at the dock, to ensure that everyone understands the requirements of the operation.

Additionally, prior to commencing an approach to the Milne Inlet Port facility, the Master assisted by the Docking Master, shall:

- Discuss the proposed operation with Baffinland personnel to confirm that the berth is clear and that mooring assistance is available to handle the ship's lines.
- Advise which side the Docking Master intends to berth the vessel, and agree the VHF Channels to be used for communications between the ship, the mooring boat, and the mooring personnel (Normally VHF Channel 5A).
- Brief the ship's crew on the order of mooring and safety procedures to be followed.
- Ensure that the vessels moorings are ready for use and all capstans & mooring winches are operational.
- Ensure that heaving lines (and extra heaving lines) and stoppers are available where they may be required.

Given that there is a need to maintain the ability to sail at any time during the course of loading, no repairs requiring the immobilizing of the main engine should be undertaken while at Milne Inlet Port. The only exception being in the case of an emergency, at which time Fednav and Baffinland should be informed immediately.

Should the Master consider that conditions are such that berthing would be hazardous, same should be postponed until conditions improve.

A vessel's approach to the berth should not be too fast and always kept under control. With the vessel being in ballast, the propeller will be close to the surface and may even be partially exposed. The major factor to be considered is the strength and direction of the wind. If it is from ahead it will create no difficulty. If blowing onshore, the angle of approach plus thoughtful use of engines, and bow thruster, and anchors should make for an easy docking. If blowing offshore extra care must be taken, the bow should be placed at the dock and a good spring placed ashore without delay, using the rudder, engine, and bow thruster to bring the stern in close alongside.

Many attempts at docking are frustrated by the crew's inability to get a line ashore promptly. It is therefore of the utmost importance that those crewmembers designated to send the heaving lines ashore be skillful and proficient. Well before docking, it is suggested that all heaving lines be checked to ensure they are free of kinks and are suitably weighted. There should be sufficient heaving lines readily available of adequate length, and the crew should be ready to bend on a second line to the first if required.

Equipment

Due to the nature of the mooring arrangements at the loading area, it is imperative that the vessel has a minimum of:

- 7 polypropylene (or other suitable material) mooring ropes of sufficient capacity for aft, all of which must be in good condition and full length
- 7 polypropylene (or other suitable material) mooring ropes of sufficient capacity for forward, all of which must be in good condition and full length

Wire and rope mooring lines must not be mixed in the same service/direction.

The normal fair weather mooring is 3 headlines, 3 stern lines, 4 breast lines, and 4 springs, but additional lines may be deployed according to the vessel and the forecasted weather conditions.

All vessels must be securely moored and maintained in the desired position at all times. The Master is responsible for ensuring that all the vessel's mooring lines are closely monitored and tended regularly to prevent excessive mooring loads on the lines or undue movement of the vessel.

The Master shall ensure that all moorings on self-tensioning winches are secured with winch brakes in locked position. **All use of self-tensioning winches in automatic mode is strictly forbidden.**

While moored alongside the Milne Inlet Port Terminal, vessels must provide and rig emergency towing wires of sufficient length and strength. These are to be placed on the seaward bow and quarter. Wire eyes shall be suspended and the height maintained just above the water level, ready for emergency towing, during the duration of the port stay.

Before finally securing alongside, the Master is to liaise with the port personnel to ensure that the first hold to be loaded is in the correct position relative to the loading arm.

No facility exists to dispose of foreign or Canadian ship waste materials or garbage at the Milne Inlet Terminal. Such materials must be stored onboard in oil tight cans for eventual disposal in accordance with IMO regulations.

Gangway Facilities

Milne Inlet Terminal shall be responsible for deploying and securing of gangway facilities. The Terminal has a shore gangway that will be installed prior to loading commencing. The means of access between the vessel and the berth must be safe and comply with regulations, as applicable. Once deployed the vessel's gangway shall be properly arranged with a safety net securely attached to the inboard and outboard railings and passing underneath the gangway. The gangway must be well illuminated during periods of darkness. A lifebuoy with a heaving line attached must be positioned on deck at the gangway.

Note: a notice shall be displayed on or near the gangway access to the vessel with the words:

No Naked Lights
No Smoking
No Unauthorized Personnel

SECTION 4: CARGO OPERATIONS

PROCEDURES BEFORE COMMENCING CARGO OPERATIONS

The Loading Plan must be prepared in accordance with the provisions of the BLU Code and must be accepted and signed by the Master or his delegated responsible officer and the Terminal Representative 7 days prior to arrival at Milne Inlet Terminal.

Immediately on arrival and before operations commence the Master or delegated responsible officer together with the Terminal Representative shall conduct a meeting in order to complete the Ship / Shore Safety Checklist (See *Appendix 5 – Documents and Certificates*) as required by the BLU Code. They shall jointly:

1. Complete security agreements related to the ISPS code (Milne Inlet Port responsible)
2. Complete and sign the Ship/Shore Check List for Dry Bulk Cargo
3. Evaluate possible deficiencies revealed by the check list and agree on additional precautions which are required. Milne Inlet Port Terminal Representative reserves the right to refuse to load a vessel if the requirements are not met.
4. Evaluate and agree on the checking and sampling of ballast water as required. Milne Inlet Port reserves the right to draw any ballast tank samples considered necessary prior to discharge of ballast.
5. Evaluate and agree on the loading programme including:
    a. Quantities and grades to be loaded
    b. Hold loading or discharging sequence
6. Agree on procedures for emergency shutdown of operations
7. Evaluate and agree on the means of communications to be used during operations.
8. Exchange information on Emergency procedures (Fire Instructions).
9. Ensure that the cargo specification data sheets are processed on board.

Before commencement of loading

- Loading shall not commence until all of the safety checks have been carried out to the satisfaction of the Port Captain, and inspection results agreed upon and signed. Milne Inlet Port reserves the right to inspect the vessel's holds and cargo systems, or anything else that may influence the quality or quantity measurement of the cargo.
- The hatch covers are to be opened by the ship’s crew upon arrival at the berth. All cargo holds are subject to inspection by Port Control prior to loading to ensure their suitability to receive the nominated cargo in accordance with the governing contract or charter party. Due to the nature of the cargo, it will be in the vessel’s interest to ensure that bilge wells are well sealed.
- Prior to commencement of loading, a draft survey will be conducted by the Port Captain and the ship to determine the vessel’s light displacement. If an independent surveyor is not available or required, such draft survey shall be conducted by the Port Captain and ship.

Milne Inlet Port will provide the vessel with communications equipment sufficient for the ship’s personnel to communicate with shore personnel at all times during loading and offloading operations.

LOADING OF IRON ORE

Cargo Characteristics

The moisture content of Milne Inlet produced iron ore is approximately 1% or less for the lump ore, and a maximum moisture limit of 4.5% for the fines. The maximum acceptable for shipment is approximately 7% dependent on grade and type of iron ore loaded.

The moisture content of the iron ore cargo will always be maintained below the Transportable Moisture Limit and certified by shippers or their designated surveyors. Documentation stating the moisture content and transportation moisture limit will be furnished by the shippers prior to the commencement of loading in the form of a Shipper's Declaration in compliance with the provisions of the IMSBC Code.

In any case, Milne Inlet Port will supply to the vessel on arrival copies of moisture certificates attesting to the actual moisture content compared to the TML (Transportable Moisture Limit). Samples of these certificates can be found in ***Appendix 5 – Documents and Certificates***.

Due to the unpredictability of the weather at Milne Inlet Port, it is imperative that during loading the vessel will **at all times** be in a position to vacate the loading area should the need suddenly arise. Vessel's stowage should therefore be carefully planned to factor this in.

Loading Method

Iron ore in lump or fines must be loaded and carried onboard the ship in accordance with the Code of Safe Practice for Solid Bulk Cargoes and the International Maritime Solid Bulk Cargo Code, as recommended by IMO.

The cargo is trucked from the mine site, which is about 100 km from the loading area and stockpiled. All iron ore will have a moisture content within the transportable moisture limit and a stowage factor of about 2.8 mt per cbm.

It is expected that loaders will be able to reach all holds without having to shift the vessel. However in the event shifting is required, please be guided by the following comments.

The vessel's crew should be so organized that, when it comes time to shift from one hatch to another or from one section of the hold to another, they immediately attend to the lines to affect the shift.

The ship's engines will be used to assist in shifting and thus, for the duration of the vessel's stay alongside, they should be kept on stand-by. The cargo will be loaded by conventional conveyor, capable of spreading the cargo within the square of the hatch.

Each of the two shiploaders is able to load a maximum of about 3,000 tonnes per hour, for planning purposes however the rate will likely be closer to a combined 4,500 tph. It is equipped with a scale, however, conveyor scales are prone to error and therefore, a proper draft survey must be carried out in conjunction with the shippers (BoL quantity will be based on the draft survey). Shore personnel have the authority to suspend loading at any time and should regularly check the vessel's draft as the vessel approaches the planned loaded draft. On completion of all cargo operations, the Bill of Lading cargo

figures will be confirmed by means of a draft survey performed by the vessel.

The conveyor will move in an arc across the length of the hold and should result in a reasonably level cargo surface, so that machine trimming is not necessary. It is however vital that the load operation be monitored to ensure the cargo is loaded in accordance with the *Bulkhandling Code* as regards moisture content, distribution of cargo, and trimming.

Notwithstanding the ability of the loader to spread the load, it is incumbent on the Officer of the Watch (OOW) to ensure that cargo is distributed evenly in the hold and to communicate clearly with the loader operator to ensure this is achieved. During the course of loading the OOW should be on deck at all times ensuring that the shore loader is trimming the cargo level, at least to the extent that it is possible with the loading arm.

If uneven loading is discovered the Master shall request the services of a trimming crew to level the cargo before the vessel can proceed to sea. However, **by careful attendance to loading, the need for eventual trimming will be eliminated.**

Below is a loading distribution plan for each cargo hold. This plan will be utilized by shiploader operators.

BAFFINLAND IRON MINES (BIM)			
Milne Inlet Terminal			
STANDARD FOR HOLD CLEANLINESS - Iron Ore Cargoes			
No.	**Cargo Discharged**	**Cargo to be Loaded**	**Cargo Hold Cleaning Standard**
1	BIM Iron Ore (Lump)	BIM Iron Ore (Lump)	Normal Clean - Sweep Only
2	BIM Iron Ore (Fines)	BIM Iron Ore (Fines)	Normal Clean - Sweep Only
3	BIM Iron Ore (Lump)	BIM Iron Ore (Fines)	Normal Clean - Sweep and Washdown
4	BIM Iron Ore (Fines)	BIM Iron Ore (Lump)	Normal Clean - Sweep and Washdown
5	Any Non-BIM Cargo	BIM Iron Ore (Lump)	Grain Clean
6	Any Non-BIM Cargo	BIM Iron Ore (Fines)	Grain Clean

It is suggested that a loading rotation for each hold be discussed with the loader operator prior to commencement. Normally, a quantity of cargo is loaded first in the centre of the hold, thereafter the loader is positioned to load evenly distributed piles in the four corners, and finally, space between the piles are to be filled. The exact amount of cargo for each pour will be a function of the amount of cargo being loaded in each hold. See Appendix 5 – Documents and Certificates for a sample of the loading diagram.

SAFETY INSTRUCTIONS

In addition to *Code of Safe Practice for Solid Bulk Cargoes* published by IMO, Masters should be aware that iron ore is potentially dusty in nature and will require care to be exercised by both deck personnel attending cargo operations, and those in spaces immediately adjacent to the main deck.

When loading these cargoes it is recommended that:

- External ventilation to be shut off; internal recirculation system only to be used.
- A no smoking, eating or drinking rule should be enforced on the weather deck and any other areas exposed to dust from the cargo.
- Galley doors be kept closed and no through passage from outside to be allowed.
- One accommodation space with direct access from the main deck should be designated as a changing room. Working clothes, boots and other protective gear to be stored there prior to entering the accommodation spaces. Wearing deck working gear inside the accommodation should be prohibited.
- No duty mess service will be available for deck personnel on duty.
- Floor, alleyways and corridors are to be adequately protected from dirt and dust.
- VHF sets used on deck to be covered with plastic bags and changed regularly.
- Deck personnel on watch at hatches to stand always on the windward side.
- Hard hats, goggles, face masks, gloves, and boots to be available to and worn by all those working on deck.
- All other precautions and hygiene rules applicable to dusty cargoes to be followed (use of protective ointments on exposed skin surfaces, showering when going off duty, thorough laundering of working clothes separately from other clothing, etc.).
- As strict water pollution regulations are enforced at Milne Inlet, no garbage, whether treated or not, may be disposed of over side.
- No hot work to be performed on deck or inside accommodation or the engine room while loading cargo.

During loading, some dust will no doubt settle on the maindeck and hatchcovers. Although perhaps not regarded as significant quantities, Masters are reminded that dust and cargo residues are to be monitored and, to the extent reasonably possible, contained on the vessel. Deck scuppers should be plugged while in port and while transiting coastal waters to Milne Inlet Port. Consequently, every effort should be made to ensure that any such accumulations be cleaned up and placed inside the holds. Should the quantities reach an unmanageable volume, please immediately contact shore-side personnel so that they can assist or deal with this. Please offer shore-side labour assistance in this regard.

When dry, the ore is relatively dusty and every precaution must be exercised to prevent airborne pollution:

- Hatches not involved in actual loading must be kept closed.
- Loading should be discontinued and hatches closed in the event that high winds result in excessive iron ore dust
- In case of consistent, heavy rain, loading to be suspended and hatches closed after due consultation with Milne Inlet Port site representative.
- Cargo spillage on deck, however small, must not be swept overboard. With deck scuppers properly cemented and plugged, overflowed quantities should be returned to relevant holds either

by hand or mechanical means (i.e., available on board).

- On completion of loading each hold, dust accumulated on cargo hatches, to be thoroughly swept back into the hold prior to closing.
- Should a major spillage occur, cargo must be stopped immediately and the Port Captain, and Port Control informed, and the resulting quantity to be returned to the hold immediately. Cargo flow to be resumed only after normal conditions are restored.

RULES TO BE OBSERVED DURING OPERATIONS

- Cargo and ballast operations will take place according to the agreed loading sequence. Any deviation from the agreed loading sequence must be communicated between the Terminal and vessel without delay.
- During cargo operations, sufficient crew must remain on board under the continuous supervision of a responsible and experienced officer to deal with routine duties and to handle possible emergency situations.
- A responsible crew member with a good command of the English language must remain on deck at all times during loading or discharging.
- The ship's responsible officer shall notify Port Captain / Port Control before the discharge of segregated ballast begins and again when this operation has been completed. If possible, the ballast outlets should be visible and the discharge should be closely monitored visually.
- All vessels alongside must be ready to leave berth at short notice.
- Fednav personnel can always be reached by the UHF radio delivered on board. A responsible crew member with good English language skills must remain on deck at all times during loading or discharging operations.
- If it is not possible to obtain contact on UHF radio, use the appropriate VHF channel used by Milne Inlet Port (VHF 16/06).
- The vessels shall, unless it is an emergency, give a minimum of 10 minutes notice when there is a need to stop the loading in order to clear the conveyor belts.
- Cargo loaded will be calculated according to the shore scale and draft survey.

Precautions in extreme weather conditions

- Vessels in ballast condition are not permitted to berth when the wind force exceeds the following limits:
    - o Vessels 50.000 – 80.000 Dwt: > 16 m/sec
    - o Vessels 80.000 - 120.000 Dwt: > 14 m/sec
- In favourable wind directions, berthing may be permitted at wind forces exceeding 16 m/sec at Pilot's discretion.
- Loading operations shall be stopped if the wind exceeds 25 m/sec. (The ship loader is to be parked and secured at 25 m/sec.)
- During periods of strong winds, more moorings should be deployed and in extreme conditions, tugs may be used for pushing in order to keep the vessel alongside.

Inspection

Representatives of Fednav or Baffinland will be entitled to board the vessel in order to check that the port regulations are being observed and that the loading equipment is in safe and good working order.

Vessel Stability

The Master shall be responsible to ensure the vessel's stability remains positive during all stages of the loading operation and adequate for the intended voyage. The Master shall be responsible to ensure that the bending moments and shear forces on the hull remain within safe limits during all stages of loading taking into consideration simultaneous de-ballasting operations as well as for the intended sea voyage.

PROCEDURES AFTER CARGO OPERATIONS

Documentation

On completion of loading, the vessel will provide to Baffinland Port Captain a **Mate's Receipt** and **Stowage Plan**. A **Statement of Facts** should also be submitted including all relevant events from the time of vessel's arrival up to the time of completion of discharging and / or loading.

The **bills of lading** shall be prepared ashore and weight will be as established by the draft survey as ascertained by the ship's officer responsible for cargo operations. The ship's figure as determined on completion of loading shall be used as the official quantity to be entered on the Bill of Lading. A **letter of authorization** from the Master to Fednav International to sign bills of lading on his behalf shall be prepared prior to the commencement of loading and sent to Fednav.

Refer to ***Appendix 5 – Documents and Certificates*** for samples of these documents.

SECTION 5: APPENDICES

APPENDIX 1 – ICE AND WEATHER INFORMATION

Ice Analysis

Milne Inlet PWOM – Enfotec Technical Services Inc. / Ice section

1. GENERAL WEATHER DATA
2. ICE CONDITIONS IN THE APPROACH TO MILNE INLET
    a. Break-up and open water season
    b. Freeze-up and fall
    c. Ice information products
    d. Radar
3. EXAMPLE OF ICE INFORMATION PRODUCTS
    a. MANICE
    b. Canada's Arctic Ice Regime Shipping System (AIRSS)
    c. AIRSS Pictorial Guide

General weather data

Pond Inlet, Nunavut, is the closest weather station to Milne Inlet. Conditions are representative of those at Milne Inlet and provide an insightful overview of climatic conditions at the approach to the port site.

Table 1. Meteorological data for Pond Inlet, Nunavut. Sources: Environment Canada; timeanddate.com

Date	Mean daily temperature (2004-2014)	Daylight
May 1 to 15	-11.45 °C	24 hrs
May 16 to 31	-4.06 °C	24 hrs
June 1 to 15	1.66 °C	24 hrs
June 16 to 30	5.01 °C	24 hrs
July 1 to 15	7.16 °C	24 hrs
July 16 to 31	7.71 °C	24 hrs
August 1 to 15	7.53 °C	21.5 hrs
August 16 to 31	4.67 °C	17.25 hrs
September 1 to 15	1.60 °C	14.5 hrs
September 16 to 30	-2.65 °C	12 hrs
October 1 to 15	-6.39 °C	9.25 hrs
October 16 to 31	-8.99 °C	6.5 hrs
November 1 to 15	-18.17 °C	2 hrs

Table 2. Wind data for Pond Inlet, Nunavut. Source: Environment Canada

Month	Mean monthly wind speed	Maximum speed	Mean number of hours with >30 kph winds	Mean monthly wind direction
May	8.6 kph	59 kph	20	SSW
June	11.8 kph	52 kph	63	S
July	10.2 kph	59 kph	41	S
August	10.5 kph	56 kph	34	S
September	14.4 kph	57 kph	78	S
October	15.9 kph	59 kph	72	S
November	11.6 kph	61 kph	35	S

Ice terminology

Bergy bit	Piece of glacier ice, 1 to 5 m above sea surface and 5 to 15 m in length.
Beset	A situation where a ship is surrounded with ice and unable to move.
Break-up	Moment when fast ice starts to fracture in late spring or summer.
Close pack	Ice in high concentration, in which pieces are mostly in contact with one another.
Concentration	Ratio expressed in tenths (/10) describing the area of water surface covered by ice as a fraction of the whole area.

Consolidated ice	Ice in a concentration of 10/10, in which pieces are frozen together.
Decayed ice / Decaying ice	Ice that is in the process of melting and clearing away.
Fast ice / Land fast ice	Ice that forms and remains fast along the coast.
First-year ice	Sea ice of not more than one (1) winter's growth; thicker than 30 cm.
Floe	Any relatively flat piece of ice 20 m or more across.
Fracturing	Breaking or rupturing of the ice cover. Applies to very close pack, compact, consolidated or land fast ice.
Freeze-up	Moment when new ice first appears in fall or early winter and the freezing process begins.
Glacial ice	Ice that has broken off from a glacier and has drifted in the sea.
Growler	Smaller piece of glacier ice than a bergy bit, less than 1 m above sea surface and less than 5 m in length.
Iceberg	Massive piece of glacial ice, 5 m or more above sea surface. May be of varying shape and size.
Ice field	A vast area of floating ice, greater than 10 km across, consisting of any floe size and ice type.
Ice-free	Area where ice is not present at all.
Ice-infested waters	Waters where ice is present.
Ice input	Ice that is due to drift from the surroundings and not from local formation.
Ice regime	A region of ice with more or less consistent ice conditions. Takes into account several factors such as concentration, thickness, age, state of decay, roughness.
***In situ* melting**	Part of the clearing process that only concerns the melting component and excludes the drifting component.
Lead	Fracture or passageway through the ice that is navigable by a surface vessel.
Melt pond	A puddle that forms on the surface of the ice due to melt.
Mobile ice / Mobile pack	Ice that is not consolidated and may drift with winds and currents.
Multi-year ice	Old ice which has survived at least two (2) summer's melt.
Old ice	Ice that has survived at least one (1) summer's melt. Can be subdivided into second-year ice and multi-year ice.
Open drift	Ice in low concentration, in which pieces are mostly not in contact with one another.
Open water	Area of freely navigable water in which ice can be seen in concentrations less than 1/10 (traces).
Pack ice	Any area of ice (excluding land fast ice). Normally used for areas with concentration higher than 6/10.
Rotten ice	Ice which has a honey-combed pattern and is in an advanced stage of decay.
Second-year ice	Old ice which has survived only one (1) summer's melt.
Shear zone	Area adjacent to the land fast ice where mobile ice becomes highly ridged and dense due to the pressure of the pack ice against the fast ice edge. The

	shear zone can consolidate and sometimes becomes part of the land fast ice.
Thaw hole	Vertical holes in ice that form when surface puddles melt through to the underlying water.

Ice conditions in the approach to Milne Inlet

Ice prevails over the entire route to Milne Inlet from November to June (8 months). Conditions are highly variable from one year to another, including for dates of break-up, open water and freeze-up. Typically, ice thickness can reach 1.6 m at the peak of winter in Pond Inlet and Milne Inlet. In Baffin Bay, the first-year ice reaches a thickness of 1.4 m and may contain inclusions of old ice (more than 2 m thick) drifting down from the polar cap.

Even though the approaches to Milne Inlet are completely ice covered for a large part of the year, the region opens for navigation during a few weeks in summer. Nonetheless, ice can be seen in various forms and concentrations at all times during the open water shipping window, mainly in Baffin Bay. Mostly, the ice is avoidable if carefully monitored as it typically consists of icebergs, growlers and traces of drifting ice from higher latitudes.

Ice in Baffin Bay

In Baffin Bay, the sea ice pack is not consolidated during winter and spring. The clear-up begins on the eastern side, along the coast of Greenland, and in the northern section in spring. In mid-June, an open water route begins to form along the coast of Greenland due to the warm West Greenland Current, and expands all the way to the approaches to Milne Inlet and Lancaster Sound, in the vicinity of Bylot Island. Western Baffin Bay clears up a few weeks later, and open drift ice regimes can be seen until mid-August. Although there is often lingering ice until late August in central Baffin Bay, in addition to numerous icebergs all summer long, the route is completely open during several weeks, until late September.

Fast ice in Pond and Milne Inlets

In the land fast ice of Navy Board Inlet, Eclipse Sound, Milne Inlet and Pond Inlet (all the channels separating Bylot and Baffin Island), the sequence of clearing events is rapid. First break-up signs generally appear in mid-July and within 3 to 4 weeks everything has melted away. Before break-up, the ice has already been softening and melting at the surface for over a month, and contains many puddles and melt ponds. Break-up marks the transition to free ice drift conditions, a stage that must be monitored carefully in order to ensure safe navigation and the choice of an optimal route. Once clear-up is complete – usually around August 10th at the latest – the channels remain open water until early October.

Figure 1 shows ice conditions in Milne Inlet and its approaches on July 18th 2012, shortly after break-up of the fast ice. At that time, ice concentration is high and floes are large. These ice conditions can be challenging for vessels that do not have icebreaking capability, as interaction between vessel and ice will be inevitable in the narrow passages. Such vessels will be unable to navigate around these floes, and neither can they effectively engage ice of that type. The narrowness of the channels can create choke points that may impede navigation for several days until these blockages clear up.

Figure 2 shows the same area 11 days later: there is almost no ice left in Milne Inlet, Eclipse Sound and Pond Inlet. However, Navy Board Inlet and the southern shore of Lancaster Sound are more packed with ice, likely due to winds and currents pushing the ice towards the shore and into the channel. This sequence is typical of summer conditions in the High Arctic and must be carefully monitored in case the ice drifts towards the vessel's route.

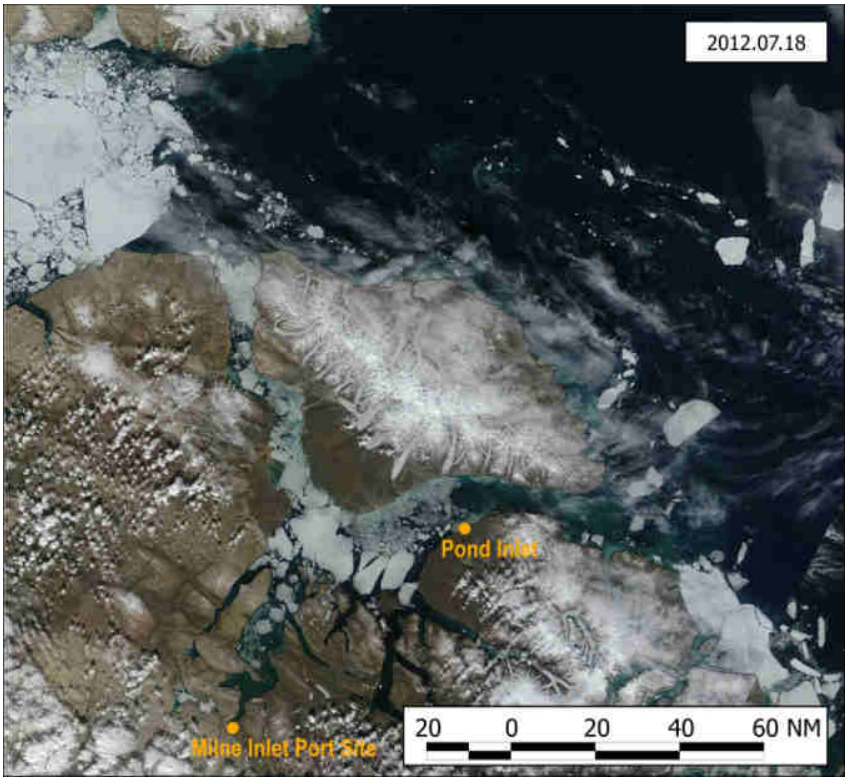


Figure 1 MODIS image on July 18, 2012. Source: Lance

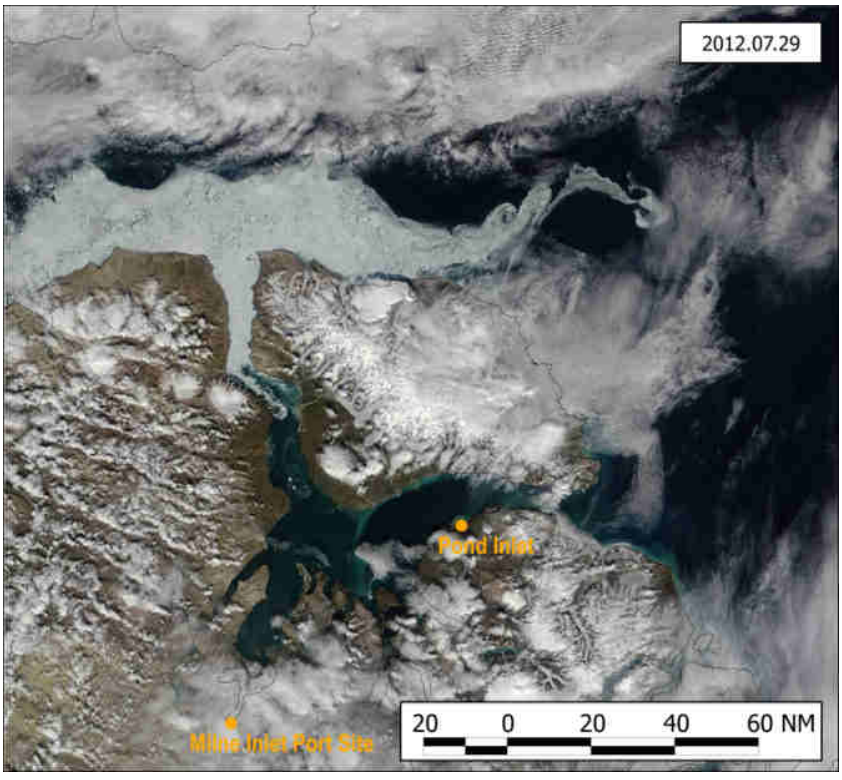


Figure 2 MODIS image on July 29, 2012. Source: LANCE

Table 3 indicates the dates when break-up and open water events occurred in the last decade. This demonstrates the pace of ice clearing in the approaches to Milne Inlet. The appearance of new ice, in fall, marks the end of the open water shipping season.

Table 3 Open water shipping season in the approaches to Milne Inlet for years 2004 to 2015.

Year	Break-up	Open water	New ice (freeze-up)	Season length
2004	July 19	August 12	October 18	67 days
2005	July 22	August 13	October 17	65 days
2006	July 15	July 29	October 23	86 days
2007	July 14	August 7	October 8	62 days
2008	July 20	August 1	October 6	66 days
2009	July 19	August 4	October 12	69 days
2010	July 19	August 8	October 11	64 days
2011	July 11	July 28	October 21	85 days
2012	July 14	August 11	October 15	65 days
2013	July 18	August 2	October 25	83 days
2014	July 25	August 8	October 23	75 days
2015	July 20	August 6	October 18	74 days
Average	*July 18*	*August 5*	*October 16*	*72 days*
Variability	*14 days*	*17 days*	*19 days*	*24 days*

Freeze-up and fall

The sequence of freeze-up events is also very rapid. As air temperature begins to drop below 0°C in the area of Pond Inlet in September, conditions rapidly become favorable to freeze-up. Arctic waters only have a short period of time in summer during which water temperature can rise, therefore it takes little time for the water to cool down enough for ice to form. As such, ice begins to form a few weeks only after air temperatures go under the freezing level.

Table 4 shows the dates when the ice reached various stages of development in the last 12 years along the approaches to Milne Inlet. New ice (less than 10 cm) normally begins to appear in the second week of October and grows rapidly. It turns into grey-white ice (15-30 cm) by the first week of November, and becomes thin first-year ice (30-70 cm) around mid-November. On average, it takes one month for the ice growth process between the first appearance of ice and the moment it thickens to thin first-year ice.

Table 4 Dates of various stages of development along the routes to Milne Inlet.

	New ice < 10 cm	**Grey ice 10-15 cm**	**Grey-white ice 15-30 cm**	**1st year ice > 30 cm**	**Fast ice**
2004	October 18	November 1	November 5	November 8	November 15
2005	October 17	October 17	October 31	November 7	Late December
2006	October 23	November 9	November 13	November 27	November 27
2007	October 8	October 22	October 29	November 12	November 19
2008	October 6	October 27	November 3	November 24	November 24
2009	October 12	November 2	November 5	November 9	November 16
2010	October 11	November 1	November 8	November 22	November 15
2011	October 21	October 24	November 7	November 21	November 14
2012	October 15	October 29	November 5	November 19	November 19
2013	October 25	October 28	November 4	November 18	November 12
2014	October 23	October 30	November 10	November 17	November 28
2015	October 18	October 27	November 2	November 12	November 9
Average	*October 16*	October *28*	*November 5*	*November 16*	*November 18**
Variability	*19 days*	*23 days*	*15 days*	*20 days*	*19 days*

**excl. 2005*

Ice information products

Meteorological and ice information is available for operational purposes and is used to help in route planning. Ice charts and satellite images depict the presence of ice, its concentration, stages of development and form (floe size, consolidation, etc.). Weather data can be used by the Master or Ice Navigator to evaluate how ice conditions are expected to evolve over the next 24 to 48 hours.

Table 5. List of ice information products available for transit to Milne Inlet.

Type of product	**Source**	**Frequency**	**Areas of coverage**	**Other info**
Canadian ice charts	Canadian Ice Service (Environment Canada)	Daily Weekly	Baffin Bay; Approaches to Resolute; Eastern Arctic	Ice concentration. Vector format includes AIRSS Ice Numerals.
Greenland ice charts	Danish Meteorological Institute	Twice weekly	Cape Farewell; West Greenland	Ice concentration including bergs.
Optical satellite images (MODIS)	NASA	Daily	Baffin Bay; Baffin Island	Visibility is subject to cloud cover.
Canadian marine wind prognosis charts	Environment Canada	Twice daily	Baffin Bay	Forecast ranges from 6 hours to 72 hours.
Canadian weather text bulletins (marine, local)	Environment Canada	Twice daily	Canadian waters; Canadian cities and communities	Forecast covers up to 5 days including current day; Includes wave height forecast.
Canadian ice text forecasts	Canadian Ice Service (Environment Canada)	Daily	Canadian waters	Forecast covers up to 2 days including current day.
Greenland sea area forecasts	Danish Meteorological Institute	Twice daily	Greenland waters	Forecast covers up to 2 days including current day.

Radar

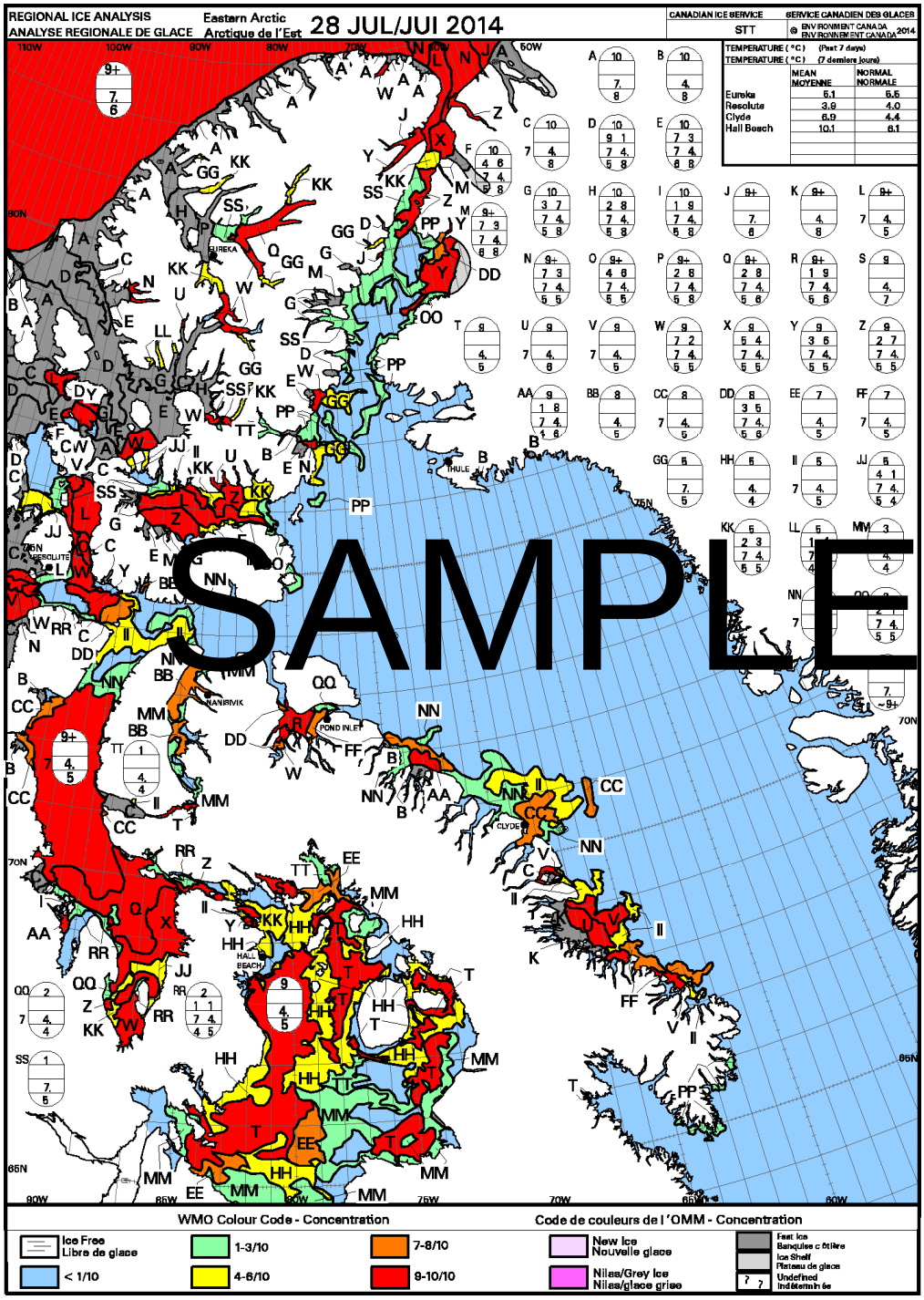
Ice detection capabilities vary according to radar types. While most marine radars can depict some ice features such as protruding icebergs, the image they provide is not suitable for ice analysis or the detection and identification of most ice features such as floes of various size, bergy bits, leads, etc. Thus, marine radar should be limited to the detection of icebergs or, at most, for the detection of the possible presence of sea ice.

The use of an enhanced marine radar for ice detection is a valuable tool when navigating in ice-covered waters, even where ice is only present in partial concentrations. The image generated by such systems is usually represented in shades of grey of varying brightness. The brightness of the different shades of grey is a factor of the strength of the reflection of the radar beam on the water or the ice. For example, brighter areas typically indicate a highly rubbled ice surface, while dark zones can mean open water or level ice. It is also possible to discern ice floes and their characteristics. An experienced user is able to identify ice types and forms with high reliability. Various image enhancement functions (contrast, brightness, scan averaging, etc.) can help optimize the view.

Example of ice information products

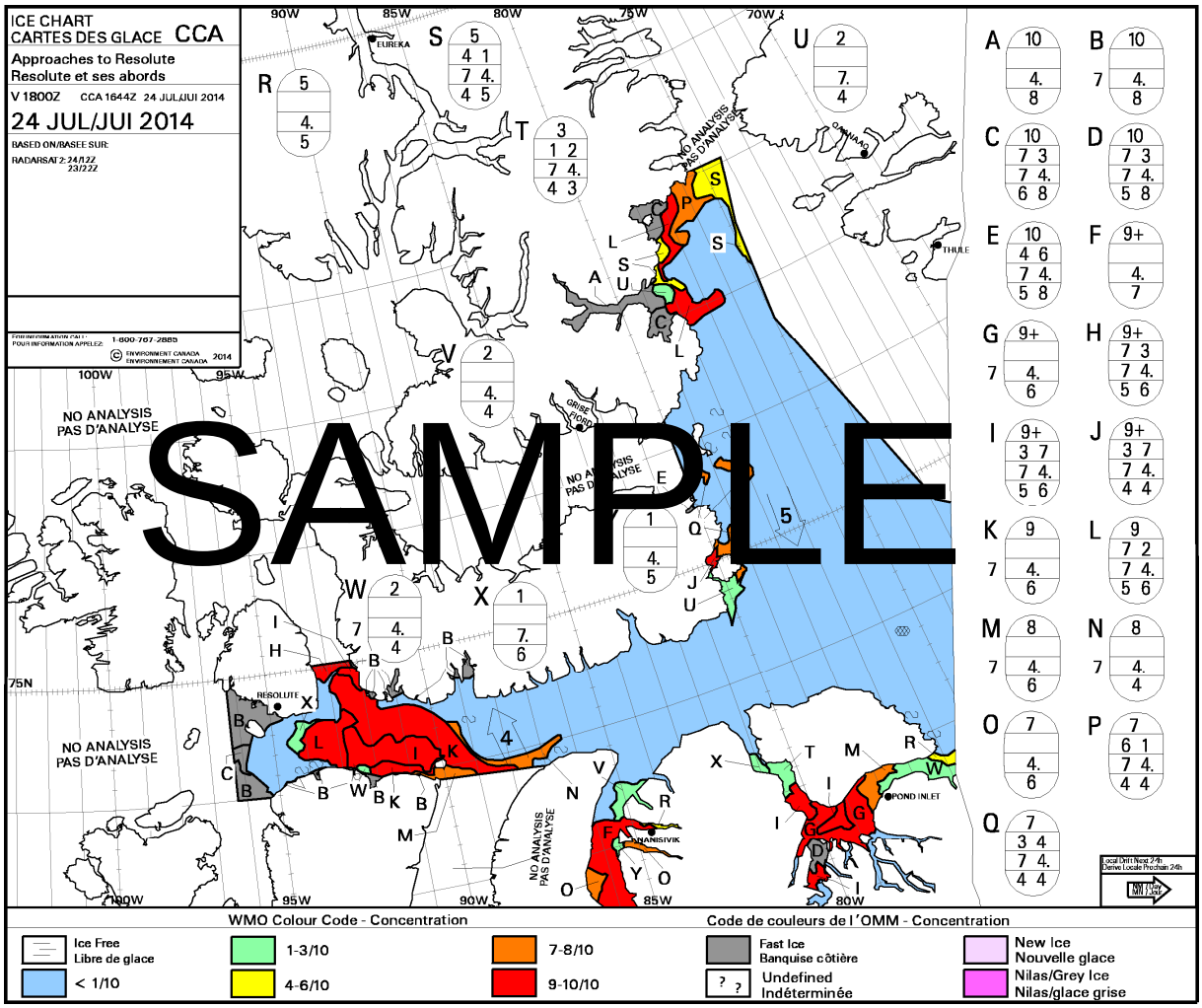
Canadian Weekly Ice Chart

Source: Canadian Ice Service



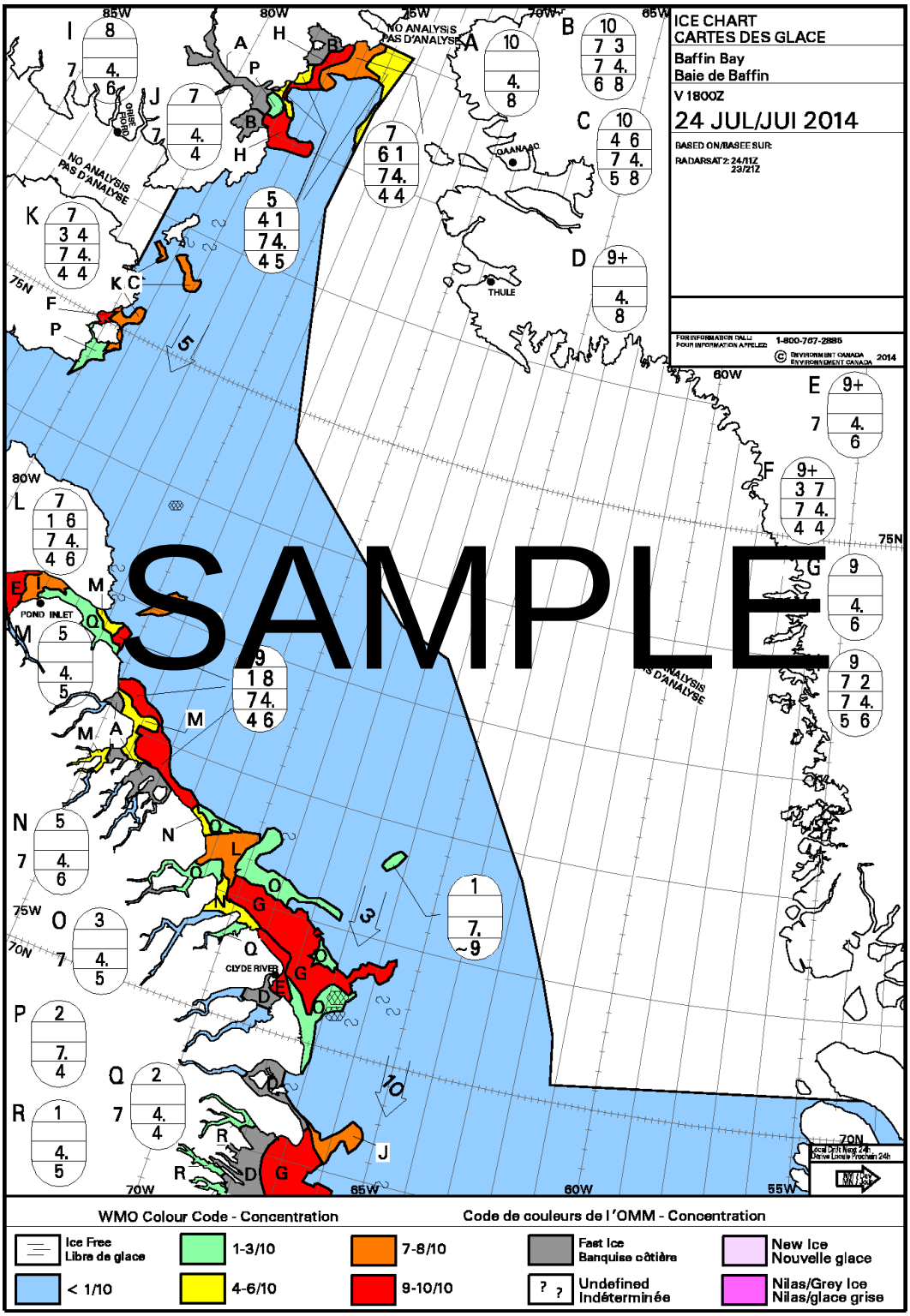
Canadian Daily Ice Chart

Source: Canadian Ice Service



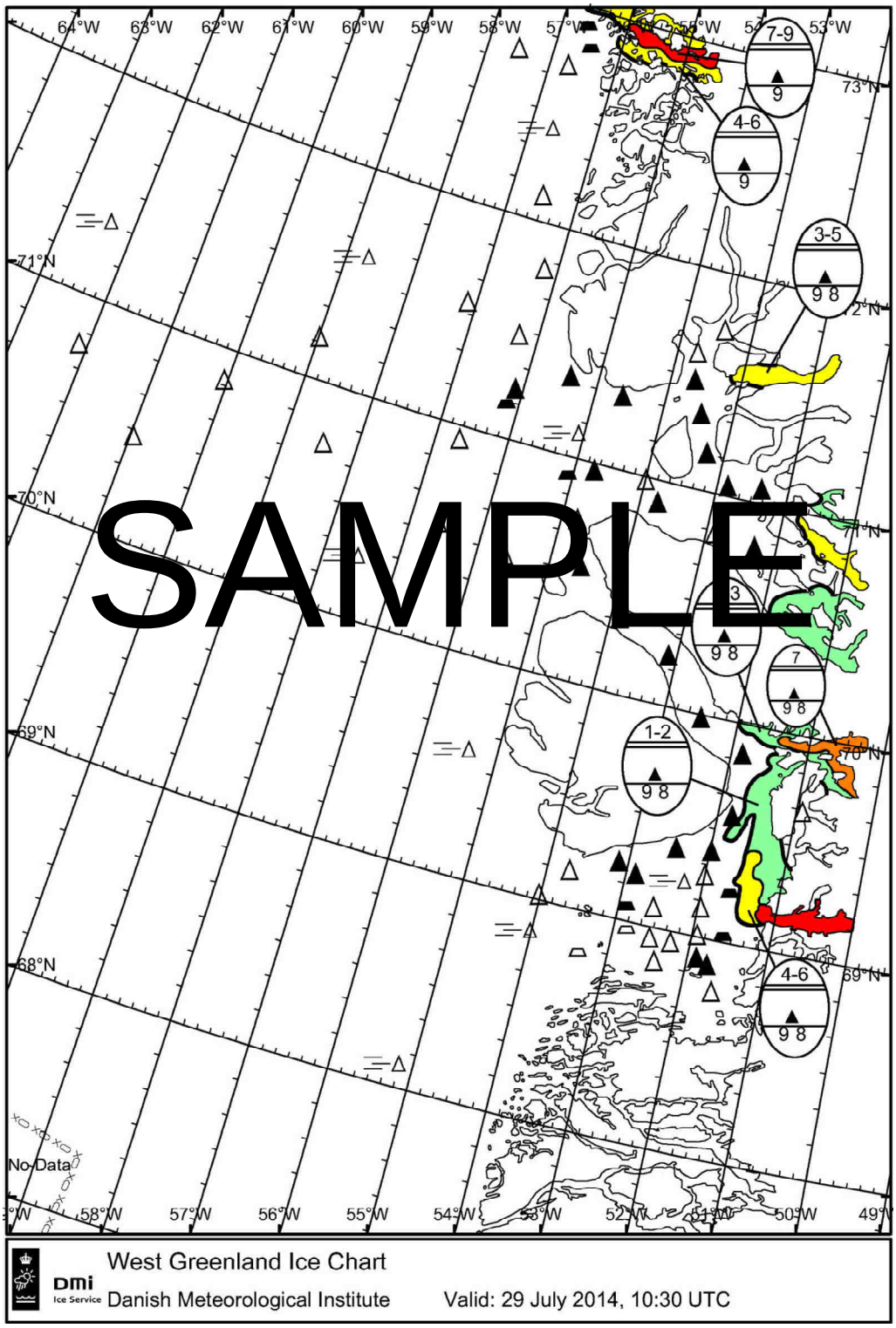
Canadian Daily Ice Chart

Source: Canadian Ice Service



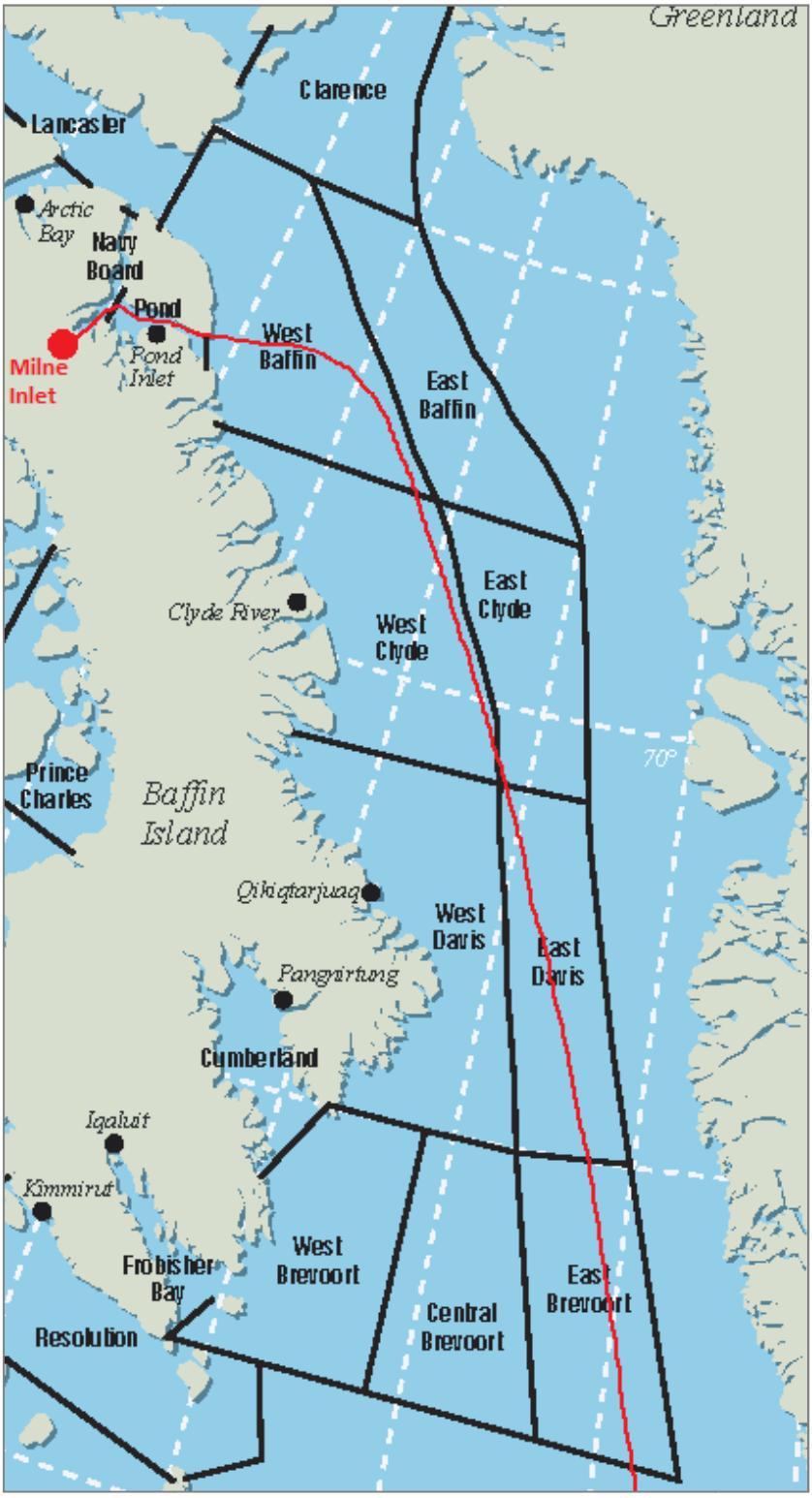
Greenland Bi-Weekly Ice Chart

Source: Danish Meteorological Institute



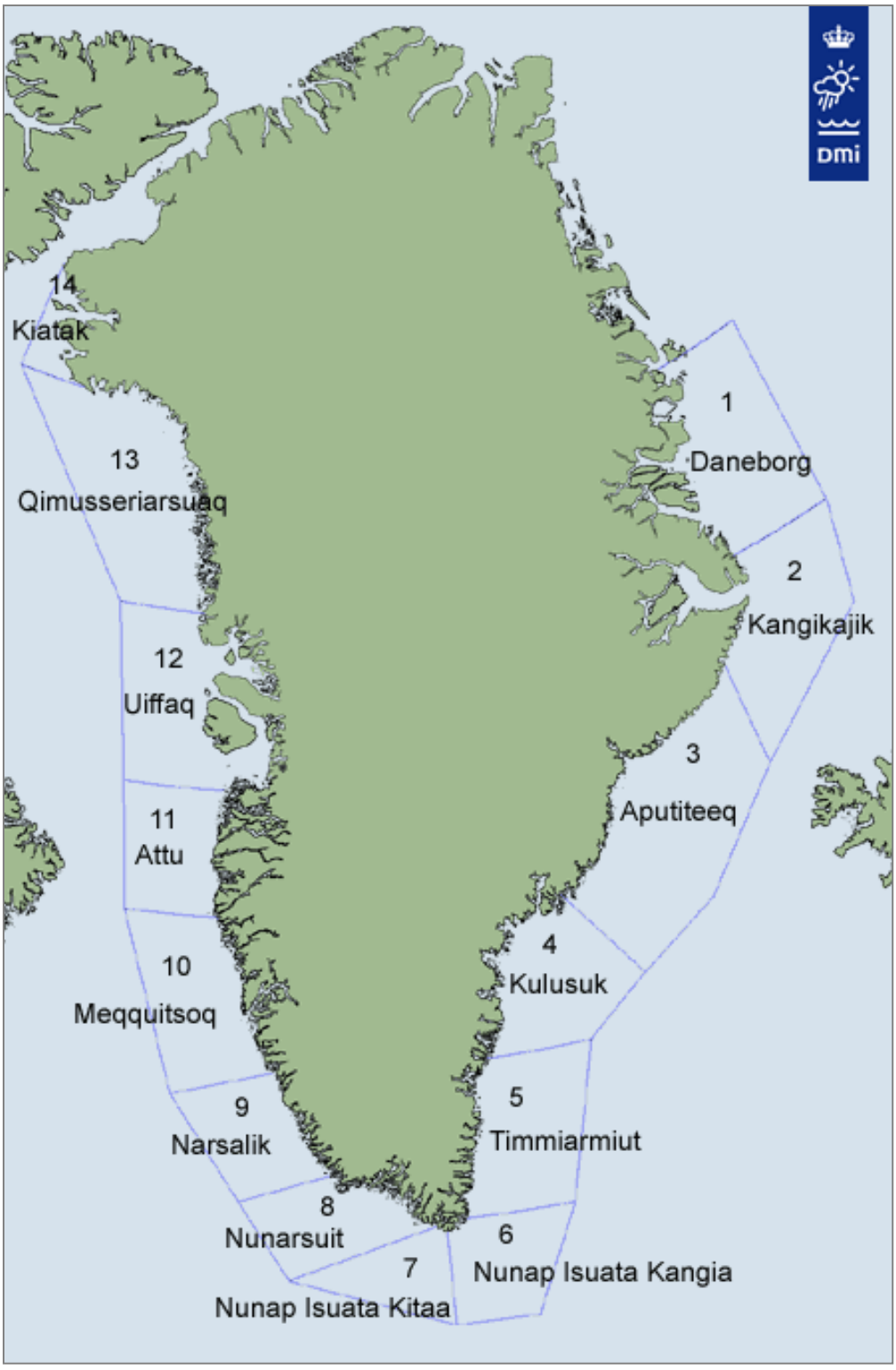
Canada Marine Forecasts

Source: Environment Canada

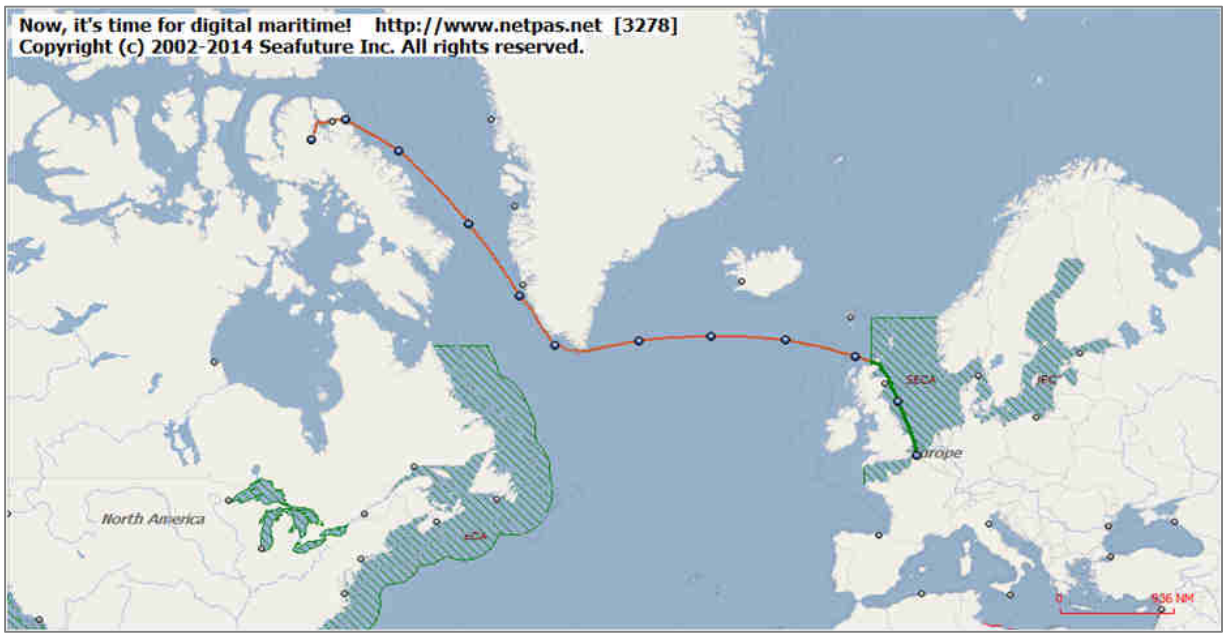


Greenland Sea Area Forecasts

Source: Danish Meteorological Institute



Planned route



MANICE

MANICE is the Manual of Standard Procedures for Observing and Reporting Ice Conditions. It describes the standard procedures of the Canadian Ice Service for observing, recording and reporting ice conditions.

MANICE has been prepared in accordance with internationally recommended terminology and symbology established by the World Meteorological Organization (WMO). It details procedures that are completely compatible with WMO nomenclature (cf. 1), coding and observing practices, along with additional procedures, coding and symbology adapted for Canadian use or, in the case of icebergs, used in conjunction with the International Ice Patrol (IIP).

MANICE is the authoritative document for observing all forms of ice:

- Sea Ice
- Lake and River Ice
- Ice of Land Origin

The most recent version of MANICE (date of revision: June 2005) contains the following sections:

- Introduction
- Table of Content
- Chapter 1: General Terminology
- Chapter 2: Ice observations
- Chapter 3: Observed Ice charts
- Chapter 4: Iceberg Messages
- Chapter 5: Ice Analysis Charts
- Chapter 6: Ice Thickness Measurements and Reports
- Conversion Table
- Key to Ice Symbols

For those interested, the most recent version can be found at the link provided below.
https://ec.gc.ca/glaces-ice/4FF82CBD-6D9E-45CB-8A55-C951F0563C35/MANICE.pdf

Description of Canadian Ice Regime Shipping Control System

Masters of vessels operating in the Canadian Arctic should be aware of the Arctic Ice Regime Shipping System. The system is fully described in Transport Canada publication TP 12259 (and the pictorial guide TP 14044). For those interested, the most recent version can be found at the link provided below:

https://www.tc.gc.ca/media/documents/marinesafety/tp14044e_airss_guide.pdf

The system and its uses are summarized in the following extract from "Ice Navigation in Canadian Waters".

Arctic Ice Regime Shipping System (AIRSS) Standards - TP 12259

Referenced in the *Arctic Shipping Pollution Prevention Regulations* (ASPPR), the *Arctic Ice Regime Shipping System (AIRSS) Standards* have been developed to enhance the safety and efficiency of shipping operations in the Canadian Arctic. The standards have been developed characterize the relative risk which different ice conditions pose to the structure of different ships.

The Zone/Date System is based on rigid controls. The AIRSS emphasizes the **responsibility of the Master** for the safety of the ship. This provides a more flexible framework to assist in decision-making. Both systems are presently working in parallel, allowing operators to navigate outside the Zone/Date limits when ice conditions permit. Operators will continue to be able to use the Zone/Date scheme to generally plan voyages to the Arctic while being encouraged to avoid dangerous ice conditions through the use of the Ice Regime System. The application of the AIRSS will require an Ice Navigator and the use of all available ice information.

The *Arctic Ice Regime Shipping Standards* are based on the concept that ice conditions can be quantified through a simple Ice Numeral calculation which indicates whether or not a given set of ice conditions (regimes) will be safe for a particular vessel. A wide range of ice navigation parameters including visibility, vessel speed, manoeuvrability, the availability of an icebreaker escort and the knowledge and experience of the crew must also be considered when applying the Ice Regime System.

The AIRSS can only be used under the following circumstances:

- If the ship has a set of Ice Multipliers. For **Canadian Arctic Category (CAC) or Type ships**, their Ice Multipliers are listed in the Ice Multiplier Table. For all other ships, Ice Multipliers are assigned on a case-by-case basis supported by the assessed ice strength of the vessel. For information on application of AIRSS in relation to Polar Class vessels, refer to Ship safety Bulletin 04/2009 IACS Unified Requirements for Polar Class Ships - Application in Canadian Arctic Waters.
- If an **Ice Regime Routing Message** is sent to NORDREG Canada.
- If the **Ice Numerals** calculated for the vessel are **zero or positive** for all of the ice regimes that are along the intended route.
- The ship must have an **Ice Navigator** on board.

There are several steps to follow in order to apply the Arctic Ice Regime Shipping System.

1. Obtain the most current ice information for the planned passage and select a desired route.
2. Determine the various ice regimes along the route and calculate the Ice Numerals for your vessel in each regime.
   The ice charts from the Canadian Ice Service are well suited to AIRSS and, based on their scale, they could be used directly to define ice regimes for voyage planning, strategic planning and to a limited extent, tactical navigation. Other forms of information, including satellite imagery, may require more interpretation by an Ice Navigator.
3. If all the Ice Numerals are zero or greater, you must advise NORDREG Canada, through the submission of an **Ice Regime Routing Message**. This message does not constitute a request for permission to proceed; rather it is made for the information of the CCG Icebreaking Superintendent via NORDREG. Based on this information, a NORDREG acknowledgement may be issued for the vessel to proceed along the projected route. This represents an acknowledgement that the planned route appears appropriate - it does not relieve Masters of their responsibility to navigate with due caution and with continuous, careful attention to the local ice conditions.
4. If the Ice Numeral for any ice regime is negative, consider the alternatives, such as selecting another route, waiting for improved in ice conditions or requesting the assistance of an icebreaker. When an icebreaker or other vessel modifies a regime, or there is a change in the ice conditions, giving positive Ice Numerals, you may proceed after advising NORDREG with the updated information.
5. Within 30 days of completing the voyage, you must send an **After Action Report** to Transport Canada.

Ice Regime Routing Message

When the *Arctic Ice Regime Shipping System* is used, the *Arctic Shipping Pollution Prevention Regulations* require that an **Ice Regime Routing Message** be sent to NORDREG. This message can, in general, be very brief, however, if the vessel's route includes areas on ice analysis charts from the Canadian Ice Service with ice concentrations that may have negative Ice Numerals, the message should include additional pertinent information explaining the voyage plan e.g. expectations of changes in conditions and/or other considerations.

This message should be updated if there are any amendments to the ship's original Ice Regime Routing Message and that would include significant changes to the ice conditions. In any event, the ship should provide an update on entering any ice regime that was previously reported as having a negative Ice Numeral. These changes could for efficiency be attached to NORDREG's regular 1600 UTC Report.

The content of the Ice Regime Routing Message is as follows:

To: Regional Ice Operations Superintendent via NORDREG Canada

Facsimile: (867) 979 – 4236 or IQANORDREG@innav.gc.ca

Ice Regime Routing Message

1. the ship's name,
2. the ship's call sign and IMO number
3. the ice strengthening of the ship (Polar Class, Type / CAC / Arctic Class / etc.),
4. the date and UTC time,
5. the ship's current position, course and speed,
6. the anticipated destination,
7. the intended route,
8. a listing of the ice regimes and their associated Ice Numerals,
9. the source(s) of ice information,
10. any other pertinent information / comments,
11. the name of any escorting vessel, and
12. the name(s) of the Ice Navigator(s) on board

Master

After Action Report

When the Arctic Ice Regime Shipping System is used, in accordance with subsection 6(3) of the *Arctic Shipping Pollution Prevention Regulations,* an after action report is required to be submitted within 30 days of leaving the area. The report can be quite brief; however, in cases where the voyage has involved difficulties or unexpected occurrences, it will be valuable to include the information that the Master considers significant. Unlike the routing message, the **After Action Report** is to be sent to the Regional Director, Marine, Prairie & Northern Region, who receives it on behalf of the Minister of Transport. The content of the After Action Report is as follows:

To: Regional Director, Marine
Transport Canada
McDonald Building - Floor: 3
344 Edmonton Street
Winnipeg, Manitoba R3B 2L4
Canada

Telephone: 204-984-1624

Facsimile: 204-984-8417

After Action Report

1. the ship's name,

2. the ice strengthening of the ship (Polar Class, Type / CAC / Arctic Class / etc.),
3. a description of the actual route, including the: ice regimes encountered, transit speeds and the Ice Numerals for each,
4. copies of the ice information used,
5. escort information, if applicable,
    a. duration of the escort,
    b. the ice regime under escort, and,
    c. the characteristics of the track, weather conditions and visibility, and any other important information.

Master

To fulfill the requirements of “d" above, it is suggested that copies of ice analysis charts or imagery used on the voyage be attached to the **After Action Report** and to make reporting easier for ship's officers, the vessel's courses drawn over the ice charts along with brief notations describing the regimes or conditions of concern. This could in essence save a lot of time and writing.

Ice Navigator

Section 26 of the *ASPPR* includes a requirement for an Ice Navigator to be on board vessels in Arctic waters under particular circumstances.

1. No tanker shall navigate within any zone without the aid of an Ice Navigator who is qualified in accordance with subsection (3).
2. No ship other than a tanker shall navigate in any zone set out in the heading to each of columns II to XVII of Schedule VIII
    a. where the words “No Entry" are shown in that column of item 14, and
    b. where a period of time is shown in that column of item 14, except during that period of time, without the aid of an Ice Navigator who is qualified in accordance with subsection (3).
3. The Ice Navigator on a ship shall

    - be qualified to act as master or person in charge of the deck watch in accordance with regulations made pursuant to the *Canada Shipping Act;* and
    - have served on a ship in the capacity of master, or person in charge of the deck watch for a total period of at least 50 days, of which 30 days must have been served in Arctic waters while the ship was in ice conditions that required the ship to be assisted by an icebreaker or to make manoeuvres to avoid concentrations of ice that might have endangered the ship.
4. Despite subsections (1) and (2), a tanker or ship referred to in those subsections may navigate in a zone without the aid of an ice navigator during any part of the transit in open water.

For the purposes of subsection (4), “open water" has the meaning assigned to that term in the Arctic Ice Regime Shipping System (AIRSS) Standards (TP 12259), published by Marine Safety, Transport Canada, in June 1996, as amended from time to time.

To summarize, an Ice Navigator is required:

> i) on all tankers (when carrying oil as cargo) at all times that the tanker is in a Shipping Safety Control Zone,
> ii) when any ship, over 100 gross tons is navigating outside the dates set out in row 14 of Schedule VIII in the ASPPR (the Type E dates from Zone / Date Table), and
> iii) while using the Arctic Ice Regime Shipping System.

Beyond the requirements, having an experienced person guiding the ship when there is the potential for encountering sea ice is always recommended. It is the ship owner's responsibility to ensure that qualified persons are on board for the intended voyage.

Note:
It is the Ice Navigator's responsibility to determine the ice regimes and use them with the Ice Multipliers to determine whether the ship is capable of handling the planned route. It is the master's responsibility to decide whether or not the ship enters the ice regime.

Characterizing the Ice Regime

AIRSS relies upon accurately assessing the ice conditions. The Canadian Ice Service issues ice charts to provide an overview of the ice conditions in different geographic regions. Ice charts are produced using the most current available technology and give an excellent indication of the general ice conditions in an area. As such, ice charts are one of the most useful resources to provide a ship with an overview of the ice conditions in a certain area, in advance of when it is needed. That information can be used successfully for strategic planning and are very useful when the ship is confronted with difficult ice conditions, to help determine alternate routes.

Although ice charts have an important role for vessels traversing ice-covered regions, their importance is no substitute for real-time observations made from the bridge. AIRSS relies upon up-to-date information that is obtained directly from the bridge and integrates that real-time information with the capability of each vessel class. This results in customized routing for each vessel, depending upon its ice-worthiness.

Ice Multiplier

One of the principal concepts behind the Ice Regime System is that every ice type including open water has a numerical value that is dependent on the ice category of the vessel. This number is called the Ice Multiplier (IM). The value of the Ice Multiplier reflects the level of risk or operational constraint that the particular ice type poses to each category of vessel. To find the applicable IM for your ship, refer to the Ice Multiplier Table and highlight the appropriate vertical column based on your ship category. This will

comprise the IM for all the different ice types listed vertically on the left side of the table. If you do not know your ship category refer to your Arctic Pollution Prevention Certificate or Schedule V of the ASPPR.

Table 2: Ice Multipliers for Ship Category

WMO Ice Codes	Ice Types	Thickness	Type E	Type D	Type C	Type B	Type A	CAC 4	CAC 3
7 or 9	Old / Multi-Year Ice (MY)		-4	-4	-4	-4	-4	-3	-1
8	Second-Year Ice (SY)		-4	-4	-4	-4	-3	-2	1
6 or 4	Thick First-Year Ice (TFY)	> 120 cm	-3	-3	-3	-2	-1	1	2
1	Medium First-Year Ice (MFY)	70-120 cm	-2	-2	-2	-1	1	2	2
7	Thin First-Year Ice (FY)	30-70 cm	-1	-1	-1	1	2	2	2
9	Thin First-Year Ice - 2nd Stage	50-70 cm	-1	-1	-1	1	2	2	2
8	Thin First-Year Ice - 1st Stage	30-50 cm	-1	-1	1	1	2	2	2
3 or 5	Grey-White Ice (GW)	15-30 cm	-1	1	1	1	2	2	2
4	Grey Ice (G)	10-15 cm	1	2	2	2	2	2	2
2	Nilas, Ice Rind	<10 cm	2	2	2	2	2	2	2

Table 2: Ice Multipliers for Ship Category

WMO Ice Codes	Ice Types	Thickness	Type E	Type D	Type C	Type B	Type A	CAC 4	CAC 3
1	New Ice (N)	<10 cm	2	2	2	2	2	2	2
	Brash (ice fragments < 2 m)		2	2	2	2	2	2	2
=Δ	Bergy Water		2	2	2	2	2	2	2
⁞⁞⁞	Open Water		2	2	2	2	2	2	2

Calculating the Ice Numeral

The Ice Numeral (IN) is an assessment of an ice regime, in mathematical terms, which is used to determine whether the ship can enter a specific ice regime. In other words, an IN is the sum of the products of the concentration, in 1/10th increments, of each ice type and their respective Ice Multipliers in each regime. For any ice regime, an Ice Numeral (IN) is the sum of the products of:

1. the concentration in tenths of each ice type, and
2. the Ice Multipliers relating to the Type or Class of the ship in question.

where:

- IN: Ice Numeral (refer to the list below - stated in grey in the Ice Multiplier list below)
- Ca: Concentration in tenths of ice type "a" (stated in blue in the Ice Multiplier list below)
- IMa: Ice Multiplier for ice type "a" (stated in red in the Ice Multiplier list below)

Equation: IN = (Ca x IMa) + (Cb x IMb) + ...

The term(s) on the right hand side of the equation (a, b, c, etc.) are repeated for as many ice types and each of their respective concentrations that may be present, including **open water**. Using arithmetic, the Ice Multipliers (IM) for the vessel and the Ice Concentrations (C- in tenths) of each ice type are combined in the following form:

Multi-year (MY) ice

[CMY x IMMY]

Concentration Multi-year ice multiplied by Ice Multiplier for Multi-year ice

Second-year(SY)ice

+ [CSY x IMSY]

Concentration Second-year ice multiplied by Ice Multiplier for Second-year ice

Thick first-year (TFY) ice

+ [CTFY x IMTFY]

Concentration Thick first-year ice multiplied by Ice Multiplier for Thick first-year ice

Grey-white (GW) ice

+ [CGW x IMGW]

Concentration Grey-white ice multiplied by Ice Multiplier for Grey-white ice

Grey (G) ice

+ [CG x IMG]

Concentration Grey ice multiplied by Ice Multiplier for Grey ice

New (N) ice

+ [CN x IMN]

Concentration New ice multiplied by Ice Multiplier for New ice

Open water (OW)

+ [COW x IMGOW]

Concentration Open water ice multiplied by Ice Multiplier for Open water ice

Thin first-year(FY) ice

+ [CFY x IMFY]

Concentration Thin first-year ice multiplied by Ice Multiplier for Thin first-year ice

Medium first-year(MFY) ice

+ [CMFY x IMMFY]

Concentration Medium first-year ice multiplied by Ice Multiplier for Medium first-year ice

IN =

?

The Ice Numeral is therefore unique to the particular ice regime and ship operating within its boundaries. The Ice Numeral for each regime **must be zero or positive** before transiting a regime and any application of AIRSS must be indicated with an Ice Regime Routing Message and an acknowledgement from NORDREG. If the Ice Numeral is NEGATIVE, the vessel should not proceed and an alternate route must be found.

Factors that may affect Ice Multipliers

Decayed Ice

For the purpose of the Ice Regime System, the definition states that decayed ice is multi-year ice, second-year ice, thick first-year ice, or medium first-year ice that has thaw holes formed or is rotten ice. For “decayed Ice" +1 may be added to that ice type's Ice Multiplier. As an example, if a Type B ship encounters decayed thick first-year ice, the Ice Multiplier changes from -2 to -1.

Ridged Ice

Where the total ice concentration in a particular regime is 6/10th's or greater, and at least 3/10th's of the area of an ice type (other than brash ice) is deformed by ridges, rubble or hummocking, the Ice Multiplier for that ice type, shall be decreased by 1. If, as an example a Type E ship finds a regime with ridged thin first-year ice, the Ice Multiplier changes from -1 to -2.

Brash Ice

Brash Ice has been given the same weighting as open water i.e. a +2 Ice Multiplier. Within the AIRSS concept this form of ice is intended to account for the ice predominately found in well-defined icebreaker tracks.

Trace of Old Ice

Traces of ice may be reported in forecasts or labeled on the left side of ice eggs. A trace means less than 1/10th ice concentration and is it not required to be part of the Ice Numeral calculation. If a trace of Old Ice is encountered, caution should be exercised when navigating due to the risk that this ice creates.

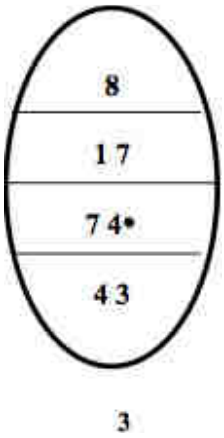
Note:

While doing any Ice Numeral calculation, remember that every regime is composed of an aggregate 10/10th concentration of various ice types. As an example, if an ice “egg" shows a total concentration of 6/10th's, remember that the other 4/10th is open water and should be accounted for in the IN calculation.

Examples of Ice Regimes and their Ice Numeral Calculations

The following examples are realistic Ice Numeral calculations based on ice “eggs" from the Canadian Ice Service Daily Ice Charts. For each case, two different ships were used to illustrate how the Ice Numerals fluctuate for the same ice with structurally different vessels.

Example 1 - Ice Egg



Interpretation: The Ice Regime consists of 8/10ths total ice concentration of which: 1/10th is Old ice and 7/10ths Thick First-Year ice. While doing the calculation remember to incorporate the 2/10ths of Open Water.

Ice Numeral Calculations:

- Type A ship:
  - (1 x -4) + (7 x -1) + (2 x 2 for open water) = -7
  - Negative Regime

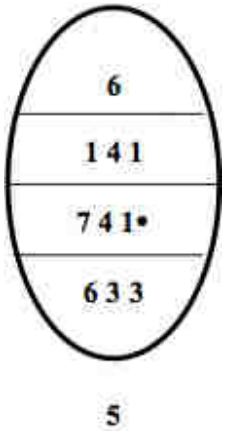
- CAC 4 ship:
  - (1 x -4) + (7 x +1) + (2 x 2 for open water) = +7
  - Positive Regime

With Ridged thick first-year ice the Ice Numeral calculations would be:

- Type A ship:
  - (1 x -4) + (7 x -2) + (2 x 2 for open water) = -14
  - Negative Regime

- CAC 4 ship:
  - (1 x -4) + (7 x 0) + (2 x 2 for open water) = 0
  - Positive Regime

Example 2 - Ice Egg



Interpretation: This July 9th Ice Regime consists of 6/10ths total concentration of ice of which 1/10th is Old ice, 4/10ths is Thick First-Year and 1/10th of Medium First-Year ice.

Ice Numeral Calculations:

- Type **E** ship:
  - (1 x **-4**) + (4 x **-3**) + (1 x **-2**) + (4 x **+2**, open water) = **-10**
  - Negative

- Type **A** ship:
  - (1 x **-4**) + (4 x **-1**) + (1 x **+1**) + (4 x **+2**, open water) = **+1**
  - Positive

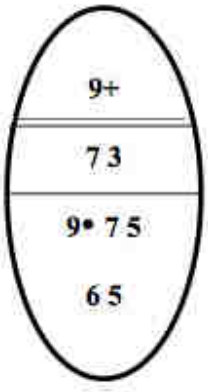
or If this regime happened to be **Decayed** based upon data on an ice chart:

With **Decayed** ice (all Ice Types) the Ice Numeral calculations are:

- Type **E** ship:
  - (1 x **-3**) + (4 x **-2**) + (1 x **-1**) + (4 x **+2**, open water) =**-4**
  - Negative

- Type **A** ship:
  - (1 x **-3**) + (4 x **0**) + (1 x **+2**) + (4 x **+2**, open water) =**+7**
  - Positive

Example 3 - Ice Egg



Interpretation: The Ice Regime consists of 9/10ths plus total concentration1 of ice in which there is a trace of Multi-Year ice, 7/10ths Thin First-Year and 3/10ths of Grey-White ice.

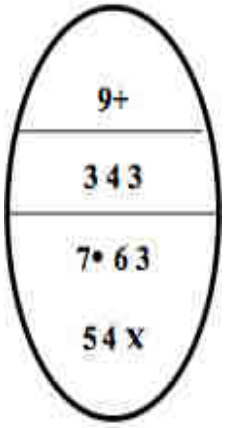
Note: A trace of Multi-Year or Old ice creates a high risk transit.

Ice Numeral Calculations:

- CAC **4** ship:
  - (7 x **2**) + (3 x **2**) = **+20**
  - Positive

- Type **C** ship:
  - (7 x **-1**) + (3 x **1**) = **-4**
  - Negative

Example 4 - Ice Egg



Interpretation: This data that has been interpreted from remote sensing imagery indicates that this regime of 9/10ths plus V ice, consists of: 3/10ths Old ice, 4/10ths of First-Year (considered thick) and 3/10ths of Young ice (considered Grey-White).

Ice Numeral Calculations:

- Type **B** ship:
  - (3 x **-4**) + (4 x **-2**) + (3 x **+1**) = **-17**
  - Negative Regime

- CAC **3** ship:
  - (3 x **-1**) + (4 x **+2)** + (3 x **+2**) = **+11**
  - Positive Regime

Negative Ice Numerals

While using the Ice Regime System, intentional entry into a negative ice regime outside the Zone/Date limits is prohibited. While navigating in the Arctic, the Master or Ice Navigator should consider several options to avoid encountering negative regimes:

1. selecting a safe route composed entirely of positive regimes,
2. obtaining more recent and / or higher quality ice information,
3. waiting for improved weather or ice conditions, or
4. requesting the assistance of an icebreaker by calling NORDERG.

NORDREG and the CCG Icebreaking Superintendent will be able to provide additional information to assist in these circumstances and will have up-to-date knowledge of the positions of icebreakers.

Escorted Operations

When ice conditions prevent, or significantly impede a ship's operations, it may be desirable or necessary to work together with another vessel or be escorted. Escorted operations are specifically allowed for in the Ice Regime System, and must be considered on an individual basis while planning routes and defining local ice regimes. Under some circumstances an escort can be effective in easing the ice conditions along the route, however, if the escort's broken track is too narrow, if the ice is under pressure, the effectiveness of an escort can be severely limited.

The icebreaker will decide whether it is safe to break a track, but the Master of the escorted ship must continue to evaluate the conditions in order to decide whether it is safe to follow, and at what speed. Communications and operating procedures must be established before any escort operation starts and maintained throughout. The following are factors to consider regarding the escort:

- the width of the broken track, in comparison with the following ship's beam,
- the size, thickness, and strength of the ice pieces left in the track, and
- the likelihood of pressure conditions, which may cause the track to close rapidly.

The track of an escort and surrounding conditions should be treated as a separate Ice Regime. Extreme caution must be exercised when working in an icebreaker's track due to the confined aspect of the track.

Early Season Voyage

An early season voyage can be described as a voyage where the vessel intends to enter the Arctic prior to the main onset of melt and expects enter a zone outside of the Zone / Date System. Entry could be possible under the Ice Regime System if there is an indication of positive Ice Numerals. In this case it will be necessary for the vessel to have on board an Ice Navigator and send an Ice Regime Routing Message to NORDREG. Following the voyage an After Action Report must be submitted even though only positive Ice Numerals may have been encountered.

Late Season Voyage

Late season voyages deserve special attention because of the certainty that ice conditions will worsen during the voyage, and the possibility that they will deteriorate rapidly. Severe, late season storms can cause pressure events and move large quantities of Multi-Year ice from high latitudes into the shipping channels.

With these voyages, a vessel may wish to enter a zone outside the Zone / Date System and entry is permitted provided there is an Ice Navigator on board, an Ice Regime Routing Message is sent to NORDREG that illustrates positive ice regimes. On late season voyages this communication with NORDREG is very important considering that the availability of Icebreaker support may be crucial if ice conditions deteriorate rapidly.

The Zone/Date System

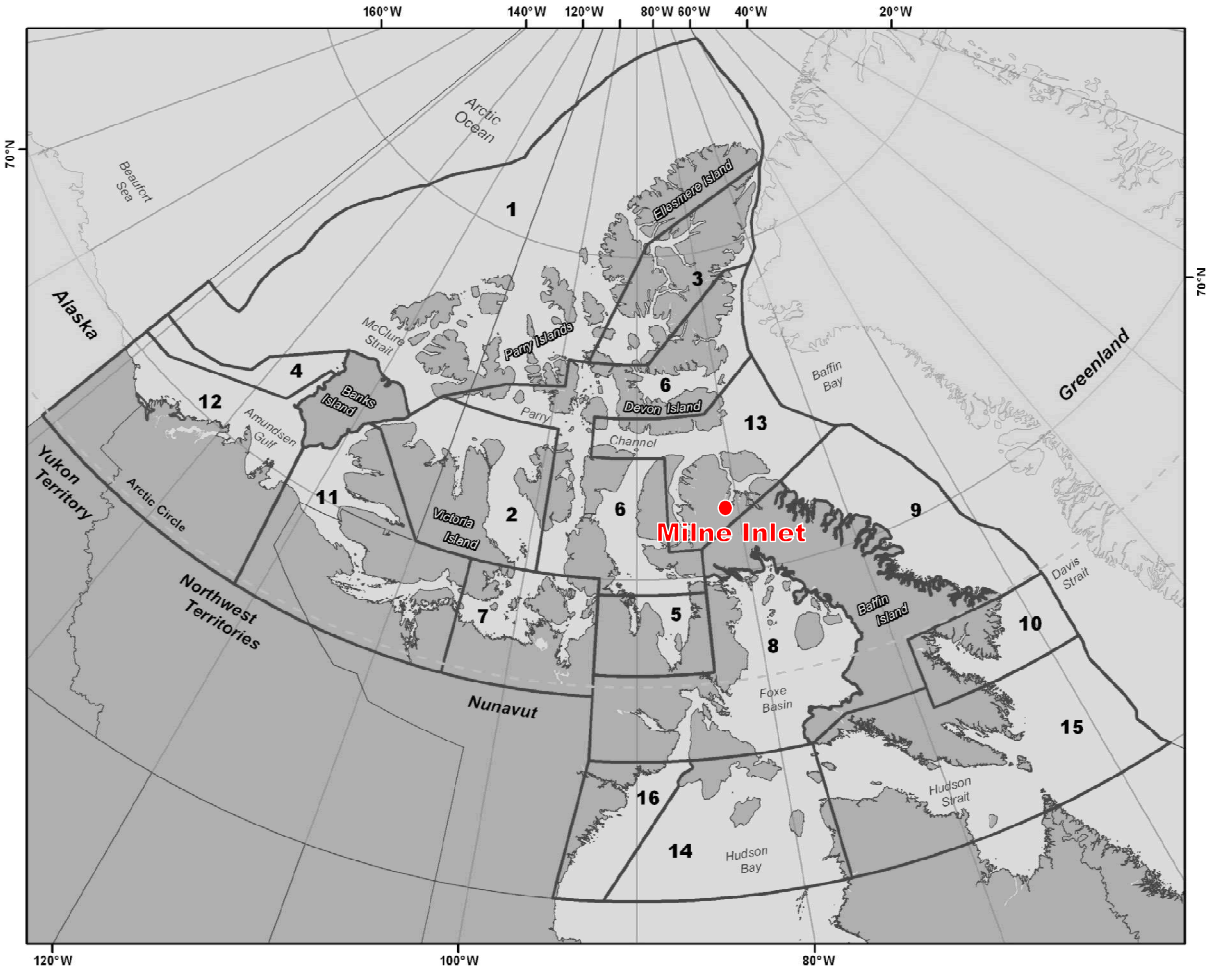
As described in the Arctic Shipping Pollution Prevention Regulations (ASPPR), The Zone/Date System (ZDS) stipulates the opening and closing dates for 16 Shipping Safety Control Zones according to ship construction standards. Refer to the map and table on the following pages for Zones locations, access dates and ship construction standards.

Using the ZDS system is straightforward and much simpler than the Arctic Ice Regime System (AIRSS). Thus, ships transiting to and from Milne Inlet must use the ZDS instead of the AIRSS if the ZDS allows them access to the required zones.
In the event that a vessel is denied access based on the ZDS, but that prevailing ice conditions along the route allow the vessel access according to the AIRSS, the vessel will need to use the AIRSS instead of the ZDS.

The only Zone that all vessels going to or from Milne Inlet must go through regardless of the route taken is Zone 13. Indeed, vessels going to or from Milne Inlet can circumvent Zones 9, 10 and 15 by navigating east of these zones.

Nonetheless, vessels can choose to go through Zones 9, 10 and 15. However, this is only possible if the ZDS or the AIRSS allows the vessel access to these Zones.

The ZDS and the AIRSS are regulatory frameworks only and cannot substitute caution and good judgment, especially while navigating in waters prone to ice hazards such as ice floes, icebergs, bergy bits and icebergs.



Map of Shipping Safety Control Zones

Table of ZDS Access dates according to Type of Ship and Construction Standards

Type of ship (ASPPR)	Access dates				Type of ship equivalencies									
	Zone 15	Zone 13	Zone 10	Zone 9	American Bureau of Shipping	Bureau Veritas	Det Nordke Veritas	Germanish er Lloyd	Loyd's Register of Shipping	Nippon Kaiji Kyokai	Polski Rejestr Statkow	Register of Shipping of the USSR	Registro Italiano Navale	Registrul Naval Roman
Type A	June 25 to Dec. 5	June 25 to Oct. 22	July 25 to Nov. 20	Aug. 1 to Nov. 20	A1 Ⓔ Ice strengthening Class AA AMS or A1 Ⓔ Ice strengthening Class 1AA AMS	1 3/3 E glace I-super or 1 3/3 E Ice Class 1A Super	1 A 1 ICE A* or 1 A 1 ICE 1A*	100 A 4 E 4 MC	100 A 1 Ice Classe 1* LMC or 100 A 1 Ice Classe 1A Super LMC	NS* (Class *1A Super* Ice strengthening) MNS * or NS* Class AA 1 S MNS*	*KM YLA or *KM YL	KM ⍟ ΥΛΑ or KM ⍟ ΥΛ	100A-1.1 RG 1* or 100-1.1 1AS	RNR ⚓ M G 60 CM O or RNR ⚓ M G 50 CM O
Type B	July 1 to Nov. 30	July 15 to Oct. 15	Aug. 1 to Oct. 31	Aug. 10 to Oct. 31	A1 Ⓔ Ice strengthening Class A AMS or A1 Ⓔ Ice strengthening Class 1A AMS	1 3/3 E glace I or 1 3/3 E Ice Class 1A	1 A 1 ICE A or 1 A 1 ICE 1A	100 A 4 E 3 MC	100 A 1 Ice Classe 1 LMC or 100 A 1 Ice Classe 1A LMC	NS* (Class *1A* Ice strengthening) MNS * or NS* Class A 1 S MNS*	*KM L1	KM ⍟ Λ1	100A-1.1 RG 1 or 100-1.1 1A	RNR ⚓ M G 40 CM O
Type C	July 1 to Nov. 25	July 15 to Oct. 10	Aug. 1 to Oct. 25	Aug. 10 to Oct. 25	A1 Ⓔ Ice strengthening Class B AMS or A1 Ⓔ Ice strengthening Class 1B AMS	1 3/3 E glace II or 1 3/3 E Ice Class 1B	1 A 1 ICE B or 1 A 1 ICE 1B	100 A 4 E 2 MC	100 A 1 Ice Classe 2 LMC or 100 A 1 Ice Classe 1B LMC	NS* (Class *1B* Ice strengthening) MNS * or NS* Class B 1 S MNS*	*KM L2	KM ⍟ Λ2	100A-1.1 RG 2 or 100-1.1 1B	RNR ⚓ M G 30 CM O
Type D	July 5 to Nov. 10	July 30 to Sep. 30	Aug. 5 to Oct. 20	Aug. 15 to Oct. 20	A1 Ⓔ Ice strengthening Class C AMS or A1 Ⓔ Ice strengthening Class 1C AMS	1 3/3 E glace III or 1 3/3 E Ice Class 1C	1 A 1 ICE C or 1 A 1 ICE 1C	100 A 4 E 1 MC	100 A 1 Ice Classe 3 LMC or 100 A 1 Ice Classe 1D LMC	NS* (Class *1C* Ice strengthening) MNS * or NS* Class C 1 S MNS*	*KM L3 or *KM L4	KM ⍟ Λ3	100A-1.1 RG 3 or 100-1.1 1C	RNR ⚓ M G 20 CM O
Type E	July 20 to Nov. 5	Aug. 15 to Sept. 20	Aug. 10 to Oct. 20	Aug. 20 to Oct. 15	A1 Ⓔ AMS	1 3/3 E	1 A 1	100 A 4 E MC	100 A 1 LMC	NS* MNS*	*KM	KM ⍟	100A-1.1	RNR ⚓ M CM O

Cold Weather Navigation Checklist (Offered for information purposes only)

[To be logged by Chief Officer on completion of preparations prior to entering zone.]
[Daily log entries to be made in Movement Book while in zone.]

Items highlighted in (Bold Italic) are critical items identified when trading in this area which should be given priority while using the checklist.

Vessel Precautions Before and During Cold Weather :		
01	FIRE LINES: ***Drain the fire-main lines and leave the drains open.*** Leave a hydrant on the lower most exposed deck open. Drain the straight-drops of the fire-line around the accommodation. Drain the anchor-wash lines. Inform E.R. and instruct duty engineer to tag the fire pumps starting panel so that deck-water is not started inadvertently.	☐
02*	***Shut the fresh water line[2] to main deck and drain the line.*** Shut the external fresh water lines to all individual accommodation external decks and drain the lines.	☐
03	Shut the bridge window wash water line and leave drain open, never attempt to start the system in sub-freezing temperatures.	☐
04	***To allow for expansion due to freezing, slack down all ballast tanks*** and ***FW tanks*** which are pressed up. When alongside, if practical, drop ballast tanks to below waterline to hopefully minimize or delay freezing. Pour antifreeze liquid into sounding pipes to prevent freezing of water in the pipe. **MDO tanks Sufficiently slacked down**.	☐
05	***Please ensure that during navigation the bridge is kept at a reasonable temperature (minimum 15 C) in order to avoid frosting of bridge windows and maintaining a proper working condition for the Docking Master(s). Portable space heaters may be required.***	☐
06*	Ensure steam to heating coils in FW tanks is open, if available.	☐
07*	Ensure steam to heating coils around bilge / ballast lines is open, if available.	☐
08*	Ensure power to Electric heater coils around hawse-pipes /air pipes/sounding pipes are switched on and kept on, if available.	☐
09*	Ensure space-heaters[3] in forward stores / under-deck spaces (e.g. bow thruster room, Emergency Fire pump room / steering flat / Emergency Gen room/ all Hydraulic pump rooms are switched on	☐

	and kept on).	
10	The deck air system and lines must be free of humidity. The deck air line must be periodically purged from each valve. Ensure that there is an operational dehumidifier on the deck air System.	☐
11	All exposed electric / air motors (gangways, lifeboats, crane, davits etc.) ***to be securely covered***. (Preferably air motors kept in a warm location & refitted just before use)	☐
12	***Start motors/ pumps of gangways / hoists/ provision cranes/hatch covers/ cargo-handling*** gear well in advance of their use. If practicable (in consultation with Ch. Engineer) keep them running, otherwise perform idling runs at a suitable frequency.	☐
13	***Start the windlass / mooring winches motors / pumps*** well in advance. If practicable (in consultation with Ch. Engineer) leave pumps running and keep the winches turning at slow speed, otherwise perform 30 minutes idling runs every 5-6 hours. (Duration and frequency to be carefully decided under the prevailing conditions)	☐
14*	Ensure all mooring-ropes / wires on the drums are kept securely covered. Other ropes to be kept under deck and brought out shortly before mooring. Mooring ropes to be coiled down on wooden-pallets and covered after berthing.	☐
15	All exposed movable parts (butterfly nuts-bolts, flap hinges, vents, valve spindles, sounding pipe / temperature pipe caps, hydrant wheel spindles, steel door dogs, etc.,) to be kept liberally covered with grease. A bit of anti-freeze mixed into the grease is very effective.	☐
16	Gangway pivots, davit pivots, pulleys, guide-rollers, wires and securing bolts, all to be liberally greased, as stated above.	☐
17*	Monorails, bunker davits to be similarly attended.	☐
18	Pilot hoists / gangways all to be similarly attended.	☐
19*	All hatch-cover side-cleats / top-wedges / eccentric wheels / balancing chain wheels / track ways hydraulic jacks to be liberally covered with grease, as stated above.	☐
20	Windlass, compression-bar on the bow-stoppers, mooring winches, cargo-winches, open gears, engaging clutches pins, operating handles, brake clamping bolt threads - all too liberally covered	☐

	with grease, as stated above. All nipple - points to be greased up.	
21*	**If the vessel has the ability to re-circulate ballast, then please do so.**	
22*	All forward deck fittings to be covered by burlap after coating with grease mixed with Glycol (Forecastle: Windlass/winch moving parts (gears operating levers, bow stopper, air pipes, and butterfly nuts. Main deck: hold cleats, hatch operation controls, air pipes)	☐
23*	All cargo-gear - running rigging - to be liberally greased.	☐
24	Do not use Manila ropes for any lashings on deck, as it becomes stiff and impossible to handle. Polypropylene and some other synthetic ropes are best suited for severe temperature use.	☐
25	***In consultation with Master, and weather permitting, lower the anchors about a foot in the hawse pipes.***	☐
26	Clear the decks and walkways between hatches of ice / snow regularly.	☐
27	Pilot-ladders to be stowed away in sheltered places. They should be rigged shortly before use (allow sufficient time). Ensure that all ladder steps are free of ice and snow before they are put in use. All steps / decks / walkways and passages into and around accommodation to be kept clear of ice / snow by regular shoveling. Street (rock) salt to be liberally sprinkled on deck /walkways / gangway and ladder steps to prevent human slipping accidents. Sufficient hands to be available for this purpose during Docking Master boarding / leaving operations. A sufficient stock of salt to be kept onboard for this purpose.	☐
28*	Ensure individual heating to bridge windows remains ON at all times.	☐
29*	Clear-view screens heaters to remain ON at all times and to be left running throughout.	☐
30*	Ensure whistle / horn heaters remain ON at all times.	☐
31	Gyro repeaters and magnetic standard compasses should be covered, when not needed.	☐
32	Slack down all signal halyards.	☐

33	**Radar scanners to be kept turning at all times (in port, the brilliance control may be set down to a minimum, unless scanner can be rotated in the stand-by mode).**	☐
34	***Keep shovels, crow bars, hammers, spikes, sledge hammers, ice mallets, pick-axe (fire-axe will suffice), grease-pot, blow lamp[4] and sufficient salt handy in convenient sheltered locations near work places.***	☐
35*	***Ballasting / de-ballasting operations to be carried out only after confirming air-pipes are clear. Keep continuously carefully monitoring the ballast pump gauges. When deballasting, it is advisable to strip each tank complete at one go to prevent freezing of the small volume left for later stripping.***	☐
36	Sanitary lines / FW lines / scupper drains which pass through exposed areas or close adjacent to the outer steelwork are liable to freeze in sub-zero temperature. These must be identified and suitably insulated. Additionally, small heaters / cargo clusters may be used in same locations provided it is safe to do so, and they can be rigged safely. Regular traders to maintain a sufficient quantity of fiber glass-wool and fiber-glass tape / cloth rolls.	☐
37	***Ice-accretion on super-structure / containers / deck-cargo / masts can seriously imperil the vessel's stability. Sufficient GM (F) to counteract same must be maintained.*** **Refer to stability manual for specific requirements.**	☐
38*	Cooling water lines to hydraulic motors for mooring winches to be isolated and drained.	☐
39	Inlet valves for draft gauges to be closed.	☐
40	Hold bilges, store bilges, chain lockers to be stripped dry.	☐
41	Steam heating to accommodation 'ON'. Steam to be the primary heating system, Backed up by individual cabin heaters. This helps cocoon the accommodation from the cold and prevents FW pipe bursts.	☐
42	It is advisable to cover porthole and window cavities with polythene or Perspex so as to provide an air buffer insulation. This makes a good contribution towards reducing the formation of ice on the inside surfaces.	☐

43	***In case of very cold conditions whilst in port, the rudder should be moved periodically.***	☐
44	Drain all save alls for tank vents, cargo & bunker manifolds.	☐
45	Wires to be rigged inside deck scupper drain pipes to clear clogs.	☐

APPENDIX 2 – MILNE INLET HOURLY TIDAL HEIGHT PREDICTIONS – SUMMER 2015

Milne Inlet - Hourly Tidal Height Predictions Expressed in Local Time																									
	EDT	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jul-15	25/07/2015	1.2	1.1	1.1	1.2	1.3	1.4	1.5	1.5	1.4	1.3	1.2	1	0.9	0.8	0.8	0.9	1.1	1.3	1.5	1.7	1.8	1.8	1.7	1.5
	26/07/2015	1.3	1.2	1.1	1	1.1	1.2	1.3	1.4	1.4	1.4	1.3	1.2	1	0.9	0.8	0.8	0.9	1.1	1.3	1.6	1.7	1.8	1.8	1.7
	27/07/2015	1.5	1.3	1.1	1	0.9	0.9	1	1.2	1.3	1.4	1.4	1.3	1.2	1	0.9	0.8	0.8	0.9	1.1	1.4	1.6	1.8	1.9	1.9
	28/07/2015	1.8	1.5	1.3	1	0.8	0.7	0.8	0.9	1.1	1.3	1.4	1.4	1.4	1.2	1	0.8	0.7	0.7	0.8	1.1	1.4	1.7	1.9	2
	29/07/2015	2	1.8	1.5	1.1	0.8	0.6	0.5	0.6	0.8	1.1	1.3	1.5	1.5	1.4	1.2	0.9	0.7	0.6	0.6	0.8	1.1	1.5	1.8	2.1
	30/07/2015	2.1	2	1.7	1.3	0.9	0.6	0.4	0.4	0.5	0.8	1.1	1.4	1.5	1.5	1.4	1.1	0.9	0.6	0.5	0.6	0.8	1.2	1.6	2
	31/07/2015	2.2	2.2	2	1.6	1.2	0.7	0.4	0.2	0.3	0.5	0.9	1.2	1.5	1.6	1.6	1.4	1.1	0.8	0.5	0.5	0.6	0.9	1.3	1.8
Aug-15	01/08/2015	2.1	2.2	2.1	1.9	1.4	0.9	0.5	0.2	0.1	0.2	0.6	1	1.4	1.6	1.7	1.6	1.4	1	0.7	0.5	0.5	0.6	1	1.5
	02/08/2015	1.9	2.2	2.2	2.1	1.7	1.2	0.7	0.3	0.1	0.1	0.3	0.7	1.2	1.5	1.7	1.8	1.6	1.3	0.9	0.6	0.5	0.5	0.7	1.1
	03/08/2015	1.6	2	2.2	2.2	1.9	1.6	1	0.5	0.2	0.1	0.1	0.4	0.9	1.3	1.7	1.8	1.8	1.6	1.3	0.9	0.6	0.5	0.6	0.8
	04/08/2015	1.2	1.7	2	2.1	2.1	1.8	1.4	0.9	0.4	0.2	0.1	0.3	0.6	1.1	1.5	1.8	1.9	1.8	1.6	1.3	0.9	0.7	0.6	0.7
	05/08/2015	0.9	1.3	1.7	2	2	1.9	1.6	1.2	0.8	0.4	0.2	0.2	0.4	0.8	1.2	1.6	1.9	1.9	1.8	1.6	1.3	1	0.8	0.7
	06/08/2015	0.8	1	1.4	1.7	1.9	1.9	1.8	1.5	1.1	0.7	0.5	0.3	0.4	0.6	1	1.4	1.7	1.9	1.9	1.8	1.6	1.3	1.1	0.9
	07/08/2015	0.8	0.9	1.1	1.3	1.6	1.7	1.7	1.6	1.4	1.1	0.8	0.6	0.5	0.6	0.8	1.1	1.4	1.7	1.9	1.9	1.9	1.7	1.4	1.2
	08/08/2015	1	0.9	0.9	1.1	1.3	1.4	1.6	1.6	1.5	1.3	1.1	0.9	0.7	0.6	0.7	0.9	1.1	1.4	1.7	1.9	2	1.9	1.8	1.5
	09/08/2015	1.3	1.1	1	0.9	1	1.1	1.3	1.4	1.4	1.4	1.3	1.2	1	0.8	0.8	0.8	0.9	1.1	1.4	1.7	1.9	2	2	1.9
	10/08/2015	1.6	1.4	1.1	0.9	0.8	0.9	1	1.1	1.3	1.4	1.4	1.4	1.3	1.1	0.9	0.8	0.8	0.9	1.1	1.4	1.7	1.9	2.1	2.1
	11/08/2015	1.9	1.7	1.4	1.1	0.8	0.7	0.7	0.9	1.1	1.3	1.4	1.5	1.5	1.3	1.1	0.9	0.8	0.8	0.9	1.1	1.4	1.8	2	2.1
	12/08/2015	2.1	1.9	1.6	1.3	1	0.7	0.6	0.6	0.8	1.1	1.3	1.5	1.6	1.5	1.3	1.1	0.9	0.7	0.7	0.9	1.1	1.5	1.8	2
	13/08/2015	2.2	2.1	1.9	1.5	1.1	0.8	0.6	0.5	0.6	0.8	1.1	1.4	1.6	1.6	1.5	1.3	1	0.8	0.7	0.7	0.9	1.2	1.6	1.9
	14/08/2015	2.1	2.1	2	1.7	1.3	0.9	0.6	0.4	0.4	0.6	0.9	1.3	1.5	1.7	1.7	1.5	1.2	0.9	0.7	0.6	0.7	1	1.3	1.7
	15/08/2015	2	2.1	2.1	1.9	1.5	1.1	0.7	0.4	0.4	0.5	0.8	1.1	1.4	1.7	1.7	1.6	1.4	1.1	0.8	0.6	0.6	0.8	1.1	1.5
	16/08/2015	1.8	2.1	2.1	2	1.7	1.3	0.8	0.5	0.4	0.4	0.6	0.9	1.3	1.6	1.7	1.7	1.6	1.3	0.9	0.7	0.6	0.7	0.9	1.3
	17/08/2015	1.6	1.9	2.1	2	1.8	1.4	1	0.7	0.4	0.4	0.5	0.8	1.2	1.5	1.7	1.8	1.7	1.4	1.1	0.8	0.7	0.6	0.8	1.1
	18/08/2015	1.4	1.8	2	2	1.9	1.6	1.2	0.8	0.5	0.4	0.5	0.7	1	1.4	1.6	1.8	1.7	1.6	1.3	1	0.8	0.7	0.7	0.9
	19/08/2015	1.2	1.6	1.8	1.9	1.9	1.7	1.4	1	0.7	0.5	0.5	0.6	0.9	1.2	1.5	1.7	1.8	1.7	1.5	1.2	1	0.8	0.7	0.8
	20/08/2015	1	1.3	1.6	1.8	1.8	1.7	1.5	1.2	0.9	0.7	0.6	0.6	0.8	1.1	1.4	1.6	1.8	1.8	1.7	1.5	1.2	1	0.9	0.8
	21/08/2015	0.9	1.2	1.4	1.6	1.7	1.7	1.6	1.3	1.1	0.8	0.7	0.7	0.8	1	1.2	1.5	1.7	1.8	1.7	1.6	1.4	1.2	1	0.9
	22/08/2015	0.9	1	1.2	1.4	1.6	1.6	1.6	1.4	1.2	1	0.8	0.8	0.8	0.9	1.1	1.3	1.5	1.7	1.8	1.7	1.6	1.4	1.2	1.1
	23/08/2015	1	1	1	1.2	1.4	1.5	1.5	1.5	1.4	1.2	1	0.9	0.8	0.8	0.9	1.1	1.3	1.5	1.7	1.8	1.7	1.7	1.5	1.3
	24/08/2015	1.1	1	1	1	1.1	1.2	1.4	1.4	1.4	1.3	1.2	1.1	1	0.9	0.9	1	1.1	1.3	1.5	1.7	1.8	1.8	1.7	1.5
	25/08/2015	1.3	1.1	1	0.9	0.9	1	1.1	1.3	1.4	1.4	1.4	1.3	1.2	1	0.9	0.9	0.9	1.1	1.3	1.5	1.7	1.8	1.9	1.8
	26/08/2015	1.6	1.3	1.1	0.8	0.7	0.7	0.8	1	1.2	1.4	1.5	1.5	1.4	1.2	1	0.8	0.8	0.8	1	1.3	1.6	1.8	1.9	1.9
	27/08/2015	1.8	1.6	1.3	0.9	0.7	0.5	0.6	0.7	0.9	1.2	1.4	1.6	1.6	1.4	1.2	0.9	0.7	0.7	0.7	0.9	1.3	1.6	1.9	2
	28/08/2015	2	1.8	1.5	1.1	0.7	0.5	0.4	0.4	0.6	1	1.3	1.6	1.7	1.6	1.4	1.1	0.8	0.6	0.5	0.6	0.9	1.3	1.7	2
	29/08/2015	2.1	2	1.8	1.4	0.9	0.5	0.3	0.2	0.3	0.7	1.1	1.5	1.7	1.8	1.7	1.4	1	0.7	0.5	0.4	0.6	1	1.4	1.8
	30/08/2015	2.1	2.1	2	1.7	1.2	0.7	0.3	0.1	0.1	0.4	0.8	1.3	1.6	1.8	1.9	1.7	1.3	0.9	0.6	0.4	0.4	0.6	1	1.5
	31/08/2015	1.9	2.1	2.1	1.9	1.5	1	0.5	0.2	0	0.2	0.5	1	1.5	1.8	2	1.9	1.7	1.3	0.8	0.5	0.4	0.4	0.7	1.1

Sep-15	01/09/2015	1.6	2	2.1	2	1.8	1.3	0.8	0.3	0.1	0.1	0.3	0.7	1.2	1.7	2	2	1.9	1.6	1.2	0.7	0.5	0.4	0.5	0.8
	02/09/2015	1.3	1.7	2	2.1	1.9	1.6	1.1	0.6	0.3	0.1	0.2	0.5	0.9	1.4	1.8	2	2.1	1.9	1.5	1.1	0.7	0.5	0.5	0.6
	03/09/2015	0.9	1.3	1.7	1.9	1.9	1.8	1.5	1	0.6	0.3	0.2	0.4	0.7	1.1	1.6	1.9	2.1	2	1.8	1.5	1.1	0.8	0.6	0.6
	04/09/2015	0.7	1	1.4	1.7	1.8	1.8	1.6	1.3	1	0.6	0.4	0.4	0.6	0.9	1.3	1.6	1.9	2	2	1.8	1.5	1.2	0.9	0.7
	05/09/2015	0.7	0.8	1.1	1.3	1.6	1.7	1.6	1.5	1.3	1	0.8	0.6	0.6	0.8	1	1.3	1.7	1.9	2	1.9	1.8	1.5	1.3	1
	06/09/2015	0.9	0.8	0.9	1	1.3	1.4	1.5	1.5	1.4	1.3	1.1	0.9	0.8	0.8	0.9	1.1	1.4	1.6	1.8	1.9	1.9	1.8	1.6	1.4
	07/09/2015	1.2	1	0.9	0.9	1	1.1	1.3	1.4	1.4	1.4	1.4	1.2	1.1	0.9	0.9	1	1.1	1.3	1.6	1.8	1.9	1.9	1.9	1.7
	08/09/2015	1.5	1.2	1	0.9	0.8	0.9	1	1.2	1.3	1.4	1.5	1.5	1.3	1.2	1	0.9	0.9	1	1.2	1.5	1.7	1.9	2	1.9
	09/09/2015	1.8	1.5	1.2	1	0.8	0.7	0.8	0.9	1.1	1.4	1.5	1.6	1.6	1.4	1.2	1	0.9	0.9	1	1.2	1.5	1.7	1.9	2
	10/09/2015	1.9	1.7	1.5	1.1	0.9	0.7	0.6	0.7	0.9	1.2	1.5	1.6	1.7	1.6	1.4	1.2	0.9	0.8	0.8	1	1.2	1.5	1.8	2
	11/09/2015	2	1.9	1.6	1.3	1	0.7	0.6	0.6	0.7	1	1.3	1.6	1.7	1.7	1.6	1.3	1	0.8	0.7	0.8	1	1.3	1.6	1.9
	12/09/2015	2	2	1.8	1.5	1.1	0.8	0.6	0.5	0.6	0.8	1.2	1.5	1.7	1.8	1.7	1.5	1.2	0.9	0.7	0.6	0.8	1	1.4	1.7
	13/09/2015	1.9	2	1.9	1.6	1.3	0.9	0.6	0.5	0.5	0.7	1	1.4	1.7	1.8	1.8	1.6	1.3	1	0.7	0.6	0.6	0.8	1.2	1.5
	14/09/2015	1.8	2	1.9	1.7	1.4	1	0.7	0.5	0.4	0.6	0.9	1.2	1.6	1.8	1.9	1.8	1.5	1.2	0.8	0.6	0.6	0.7	0.9	1.3
	15/09/2015	1.7	1.9	1.9	1.8	1.5	1.2	0.8	0.5	0.4	0.5	0.7	1.1	1.5	1.7	1.9	1.8	1.6	1.3	1	0.7	0.6	0.6	0.8	1.1
	16/09/2015	1.4	1.7	1.9	1.8	1.7	1.3	1	0.7	0.5	0.5	0.7	1	1.3	1.6	1.9	1.9	1.8	1.5	1.2	0.9	0.6	0.6	0.6	0.9
	17/09/2015	1.2	1.6	1.8	1.8	1.7	1.5	1.2	0.8	0.6	0.5	0.6	0.8	1.2	1.5	1.8	1.9	1.9	1.7	1.4	1.1	0.8	0.6	0.6	0.8
	18/09/2015	1	1.3	1.6	1.7	1.7	1.6	1.3	1	0.7	0.6	0.6	0.8	1	1.3	1.7	1.9	1.9	1.8	1.6	1.3	1	0.8	0.7	0.7
	19/09/2015	0.9	1.1	1.4	1.6	1.7	1.6	1.4	1.2	0.9	0.7	0.7	0.7	0.9	1.2	1.5	1.7	1.9	1.9	1.7	1.5	1.3	1	0.8	0.8
	20/09/2015	0.8	1	1.2	1.4	1.6	1.6	1.5	1.3	1.1	0.9	0.8	0.8	0.9	1	1.3	1.5	1.7	1.8	1.8	1.7	1.5	1.2	1	0.9
	21/09/2015	0.8	0.9	1	1.2	1.4	1.5	1.5	1.4	1.3	1.1	1	0.9	0.9	1	1.1	1.3	1.5	1.7	1.8	1.8	1.7	1.5	1.3	1.1
	22/09/2015	0.9	0.8	0.9	1	1.1	1.3	1.4	1.4	1.4	1.3	1.2	1.1	1	1	1	1.1	1.3	1.5	1.7	1.8	1.8	1.7	1.5	1.3
	23/09/2015	1.1	0.9	0.8	0.8	0.9	1	1.2	1.3	1.4	1.4	1.4	1.3	1.2	1	1	1	1	1.2	1.4	1.6	1.8	1.8	1.7	1.6
	24/09/2015	1.3	1.1	0.9	0.7	0.6	0.7	0.9	1.1	1.3	1.5	1.6	1.5	1.4	1.2	1	0.9	0.9	0.9	1.1	1.4	1.6	1.8	1.9	1.8
	25/09/2015	1.6	1.3	1	0.7	0.5	0.5	0.6	0.8	1.1	1.4	1.6	1.7	1.6	1.5	1.2	1	0.8	0.7	0.8	1	1.4	1.7	1.9	1.9
	26/09/2015	1.9	1.6	1.3	0.9	0.6	0.4	0.4	0.5	0.8	1.2	1.5	1.8	1.8	1.7	1.5	1.1	0.8	0.6	0.6	0.7	1	1.4	1.7	1.9
	27/09/2015	2	1.9	1.5	1.1	0.7	0.4	0.2	0.3	0.5	0.9	1.4	1.7	1.9	1.9	1.8	1.4	1	0.7	0.4	0.4	0.6	1	1.4	1.8
	28/09/2015	2	2	1.8	1.4	0.9	0.5	0.2	0.1	0.3	0.6	1.1	1.6	1.9	2.1	2	1.7	1.3	0.8	0.5	0.3	0.4	0.6	1.1	1.5
	29/09/2015	1.9	2	2	1.7	1.2	0.7	0.3	0.1	0.1	0.4	0.8	1.4	1.8	2.1	2.2	2	1.6	1.2	0.7	0.4	0.3	0.4	0.7	1.2
	30/09/2015	1.6	1.9	2	1.9	1.5	1.1	0.6	0.2	0.1	0.2	0.6	1	1.6	2	2.2	2.2	1.9	1.5	1	0.6	0.3	0.3	0.4	0.8
Oct-15	01/10/2015	1.3	1.7	1.9	1.9	1.7	1.4	0.9	0.5	0.2	0.2	0.4	0.8	1.3	1.8	2.1	2.2	2.1	1.8	1.4	1	0.6	0.4	0.4	0.6
	02/10/2015	0.9	1.3	1.7	1.8	1.8	1.6	1.3	0.9	0.5	0.3	0.4	0.6	1	1.4	1.9	2.1	2.2	2	1.8	1.4	0.9	0.6	0.5	0.5
	03/10/2015	0.7	1	1.4	1.6	1.7	1.7	1.5	1.2	0.9	0.6	0.5	0.6	0.8	1.1	1.5	1.9	2.1	2.1	2	1.7	1.3	1	0.7	0.6
	04/10/2015	0.6	0.8	1	1.3	1.5	1.6	1.6	1.4	1.2	1	0.8	0.7	0.8	1	1.3	1.6	1.8	2	2	1.9	1.7	1.4	1.1	0.9
	05/10/2015	0.7	0.7	0.8	1	1.2	1.4	1.5	1.5	1.4	1.3	1.1	1	0.9	0.9	1.1	1.3	1.5	1.7	1.9	1.9	1.8	1.7	1.4	1.2
	06/10/2015	1	0.8	0.8	0.8	1	1.2	1.3	1.4	1.5	1.5	1.4	1.3	1.1	1	1	1.1	1.3	1.5	1.6	1.8	1.8	1.8	1.7	1.5
	07/10/2015	1.3	1	0.9	0.8	0.8	0.9	1.1	1.3	1.4	1.6	1.6	1.5	1.4	1.2	1.1	1	1.1	1.2	1.4	1.6	1.7	1.8	1.8	1.7
	08/10/2015	1.5	1.3	1	0.8	0.7	0.8	0.9	1.1	1.3	1.5	1.7	1.7	1.6	1.4	1.2	1.1	1	1	1.1	1.3	1.5	1.7	1.8	1.8
	09/10/2015	1.7	1.5	1.2	0.9	0.8	0.7	0.7	0.9	1.2	1.4	1.7	1.8	1.8	1.6	1.4	1.2	1	0.9	0.9	1.1	1.3	1.5	1.7	1.8

APPENDIX 3 – REPORTING PROCEDURES

NORDREG

Vessel Traffic Reporting Arctic Canada Traffic Zone (NORDREG)
http://www.ccg-gcc.gc.ca/eng/MCTS/Vtr_Arctic_Canada

The purpose of this notice is to describe to shipboard personnel the ship reporting procedures to be followed by vessels when within or intending to enter the waters of Arctic Canada.

Northern Canada Vessel Traffic Services Zone (NORDREG) includes the shipping safety control zones prescribed by the Shipping Safety Control Zones Order, the waters of Ungava Bay, Hudson Bay and Kugmallit Bay that are not in a shipping safety control zone, the waters of James Bay, the waters of the Koksoak River from Ungava Bay to Kuujjuaq, the waters of Feuilles Bay from Ungava Bay to Tasiujaq, the waters of Chesterfield Inlet that are not within a shipping safety control zone, and the waters of Baker Lake, and the waters of the Moose River from James Bay to Moosonee.

NORDREG objectives:

The Northern Canada Vessel Traffic Services Zone Regulations formally establish the Northern Canada Vessel Traffic Services (NORDREG) Zone and, consistent with international law regarding ice-covered areas, implement the requirements for vessels to report information prior to entering, while operating within and upon exiting Canada's northern waters. The Regulations replace the informal NORDREG Zone (i.e. Arctic Canada VTS zone) and the voluntary reporting system that has existed in Canada's northern waters, enhancing the effectiveness of the official NORDREG Zone and Canada's ability to facilitate the safe and efficient movement of marine traffic. The Regulations will enhance the safety of vessels, crew and passengers, and will safeguard the unique and fragile Arctic marine environment. The Regulations are designed to ensure that the most effective services are available to accommodate current and future levels of marine traffic.

The Northern Canada Vessel Traffic Services Zone regulations apply to:

1. vessels of 300 gross tonnage or more;
2. vessels that are engaged in towing or pushing another vessel, if the combined gross tonnage of the vessel and the vessel being towed or pushed is 500 gross tonnage or more; and
3. vessels that are carrying as cargo a pollutant or dangerous goods, or that are engaged in towing or pushing a vessel that is carrying as cargo a pollutant or dangerous goods.

Reports required:

Type of report

Every report required by any of sections below must begin with the term "NORDREG" and be followed by whichever of the following two letters corresponds to the report:

1. "SP", in the case of a sailing plan report;
2. "PR", in the case of a position report;
3. "FR", in the case of a final report;
4. "DR", in the case of a deviation report.

Sailing plan report

1. A sailing plan report must be provided

1. when a vessel is about to enter the NORDREG Zone;
2. more than one hour but not more than two hours before a vessel departs from a berth within the NORDREG Zone, unless the vessel is moving to another berth in the same port; and
3. immediately before a vessel gets underway within the NORDREG Zone, if the vessel
    1. has been stranded,
    2. has stopped as a result of a breakdown in the main propulsion or steering system, or
    3. has been involved in a collision.

Position report

1. A position report must be provided
    1. immediately after a vessel enters the NORDREG Zone; and
    2. daily at 1600 Coordinated Universal Time (UTC), if a vessel is underway within the NORDREG Zone, unless the information required by regulation 19-1, Long-range identification and tracking of ships, of Chapter V of SOLAS, is being transmitted in accordance with that regulation.

Additional position report

1. A position report must also be provided as soon as feasible after a vessel's master becomes aware of any of the following, if the vessel is within or about to enter the NORDREG Zone:
    1. another vessel in apparent difficulty;
    2. any obstruction to navigation;
    3. an aid to navigation that is not functioning properly or is damaged, out of position or missing;
    4. any ice or weather conditions that are hazardous to safe navigation; and
    5. a pollutant in the water.

Final report

1. A final report must be provided
    1. on the arrival of a vessel at a berth within the NORDREG Zone; and
    2. immediately before a vessel exits the NORDREG Zone.

Deviation report

1. A deviation report must be provided when
    1. a vessel's position varies significantly from the position that was expected based on the sailing plan report; or
    2. a vessel's intended voyage changes from the sailing plan report.

Address of report

Every report must be addressed to NORDREG CANADA and be provided to one of the Marine Communications and Traffic Services Centres that is designated by the Canadian Coast Guard to receive the report.

Please forward your information to Iqaluit MCTS via radio, facsimile, email, telex or telephone.

Iqaluit MCTS
P.O. Box 189
Iqaluit, NU
X0A 0H0
Telephone: 867-979-5269
Fax: 867-979-4264

NORDREG
Iqaluit MCTS
P.O. Box 189
Iqaluit, NU
X0A 0H0
Telephone: 867-979-5724
Fax: 867-979-4264

Email: iqaNordreg@innav.gc.ca

Telex (telefax): 063-15529
Telegraphic Identifier - NORDREG CANADA

ICE ROUTING REPORT FOR NORDREG CANADA

Example

A. Vessel name	ARCTIC
B. Vessel call sign	VCLM 7517507
C. Vessel type and ice class	OBO / Arctic class 3 enhanced / CAC 4 equivalent
D. Assigned ice multipliers	MY ice -2, 2nd year ice -1, thick 1st year ice +1, all others +2
E. Report date	May 01, 2015 – 1400 UTC
F. Position, heading and average speed	5607N 5400W / 328° T / 13.5 kts
G. Destination	Deception Bay, Quebec
H. ETA destination	May 04, 2015 – 0800 UTC
I. ETA entrance into NORDREG waters	May 02, 2015 – 0200 UTC
J. Planned routing from 60°N to destination	From present position to 6100N 6002W to 6112N 6111W to 6110N 6310W to 6112N 6500W […] and thence to destination, through Deception Bay.
K. Description of ice regimes to be transited and associated Ice Numeral	*See attached ice chart for proposed routing. 1) open water (IN +20) 2) 5/10 thick 1st year ice with trace of old ice in medium floes (IN +16) 3) 9/10 thick, medium and thin 1st year ice in small and medium floes (IN +16) 4) … 5) …
L. Ice information products used for route planning and navigation	CIS ice charts, satellite imagery and weather information provided by Enfotec Technical Services Inc. (Fednav) Ice radar (IceNav)
M. Use of icebreaker escort	No escort
N. Crew members qualified for ice navigation	John Smith, Master (25 years of experience) Paul Johnson, C/O (10 years of experience) Sue Williams, Ice Navigator (12 years of experience)

For the full description of requirements refer to the following pages.

CANADA

CONSOLIDATION

CODIFICATION

Northern Canada Vessel Traffic Services Zone Regulations

Règlement sur la zone de services de trafic maritime du Nord canadien

SOR/2010-127

DORS/2010-127

Current to April 27, 2015

Last amended on July 1, 2010

À jour au 27 avril 2015

Dernière modification le 1 juillet 2010

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http://lois-laws.justice.gc.ca

OFFICIAL STATUS OF CONSOLIDATIONS

Subsections 31(1) and (3) of the *Legislation Revision and Consolidation Act*, in force on June 1, 2009, provide as follows:

Published consolidation is evidence

31. (1) Every copy of a consolidated statute or consolidated regulation published by the Minister under this Act in either print or electronic form is evidence of that statute or regulation and of its contents and every copy purporting to be published by the Minister is deemed to be so published, unless the contrary is shown.

...

Inconsistencies in regulations

(3) In the event of an inconsistency between a consolidated regulation published by the Minister under this Act and the original regulation or a subsequent amendment as registered by the Clerk of the Privy Council under the *Statutory Instruments Act*, the original regulation or amendment prevails to the extent of the inconsistency.

NOTE

This consolidation is current to April 27, 2015. The last amendments came into force on July 1, 2010. Any amendments that were not in force as of April 27, 2015 are set out at the end of this document under the heading "Amendments Not in Force".

CARACTÈRE OFFICIEL DES CODIFICATIONS

Les paragraphes 31(1) et (3) de la *Loi sur la révision et la codification des textes législatifs*, en vigueur le 1er juin 2009, prévoient ce qui suit :

Codifications comme élément de preuve

31. (1) Tout exemplaire d'une loi codifiée ou d'un règlement codifié, publié par le ministre en vertu de la présente loi sur support papier ou sur support électronique, fait foi de cette loi ou de ce règlement et de son contenu. Tout exemplaire donné comme publié par le ministre est réputé avoir été ainsi publié, sauf preuve contraire.

[...]

Incompatibilité — règlements

(3) Les dispositions du règlement d'origine avec ses modifications subséquentes enregistrées par le greffier du Conseil privé en vertu de la *Loi sur les textes réglementaires* l'emportent sur les dispositions incompatibles du règlement codifié publié par le ministre en vertu de la présente loi.

NOTE

Cette codification est à jour au 27 avril 2015. Les dernières modifications sont entrées en vigueur le 1 juillet 2010. Toutes modifications qui n'étaient pas en vigueur au 27 avril 2015 sont énoncées à la fin de ce document sous le titre « Modifications non en vigueur ».

TABLE OF PROVISIONS

TABLE ANALYTIQUE

Registration
SOR/2010-127 June 10, 2010

CANADA SHIPPING ACT, 2001

Northern Canada Vessel Traffic Services Zone Regulations

P.C. 2010-732 June 10, 2010

Her Excellency the Governor General in Council, on the recommendation of the Minister of Transport, pursuant to paragraphs 136(1)(*a*)[a], (*b*)[a] and (*i*)[a] of the *Canada Shipping Act, 2001*[b], hereby makes the annexed *Northern Canada Vessel Traffic Services Zone Regulations*.

[a] S.C. 2005, c. 29, s. 18
[b] S.C. 2001, c. 26

Enregistrement
DORS/2010-127 Le 10 juin 2010

LOI DE 2001 SUR LA MARINE MARCHANDE DU CANADA

Règlement sur la zone de services de trafic maritime du Nord canadien

C.P. 2010-732 Le 10 juin 2010

Sur recommandation du ministre des Transports et en vertu des alinéas 136(1)*a*)[a], *b*)[a] et *i*)[a] de la *Loi de 2001 sur la marine marchande du Canada*[b], Son Excellence la Gouverneure générale en conseil prend le *Règlement sur la zone de services de trafic maritime du Nord canadien*, ci-après.

[a] S.C. 2005, c. 29, s. 18
[b] L.C. 2001, ch. 26

NORTHERN CANADA VESSEL TRAFFIC SERVICES ZONE REGULATIONS

INTERPRETATION

Definitions

1. The following definitions apply in these Regulations.

"Act" « *Loi* »
"Act" means the *Canada Shipping Act, 2001*.

"berth" « *poste d'amarrage* »
"berth" includes a wharf, a pier, an anchorage and a mooring buoy.

"dangerous goods" « *marchandises dangereuses* »
"dangerous goods" means the substances, materials and articles covered by the *International Maritime Dangerous Goods Code*.

"NORDREG Zone" « *zone NORDREG* »
"NORDREG Zone" means the Northern Canada Vessel Traffic Services Zone established under section 2.

"oil" « *hydrocarbures* »
"oil" has the same meaning as in section 165 of the Act.

"pollutant" « *polluant* »
"pollutant" has the same meaning as in section 185 of the Act.

"SOLAS" « *SOLAS* »
"SOLAS" means the International Convention for the Safety of Life at Sea, 1974, and the Protocol of 1988 relating to the Convention, as amended from time to time.

NORTHERN CANADA VESSEL TRAFFIC SERVICES ZONE

Prescribed zone

2. The Northern Canada Vessel Traffic Services Zone is established. It consists of

(*a*) the shipping safety control zones prescribed by the *Shipping Safety Control Zones Order*;

(*b*) the waters of Ungava Bay, Hudson Bay and Kugmallit Bay that are not in a shipping safety control zone;

(*c*) the waters of James Bay;

RÈGLEMENT SUR LA ZONE DE SERVICES DE TRAFIC MARITIME DU NORD CANADIEN

DÉFINITIONS

Définitions

1. Les définitions qui suivent s'appliquent au présent règlement.

« hydrocarbures » "oil"
« hydrocarbures » S'entend au sens de l'article 165 de la Loi.

« Loi » "Act"
« Loi » La *Loi de 2001 sur la marine marchande du Canada*.

« marchandises dangereuses » "dangerous goods"
« marchandises dangereuses » S'entend des substances, des matières et des objets qui sont visés dans le *Code maritime international des marchandises dangereuses*.

« polluant » "pollutant"
« polluant » S'entend au sens de l'article 185 de la Loi.

« poste d'amarrage » "berth"
« poste d'amarrage » S'entend notamment d'un quai, d'une jetée, d'un poste de mouillage ou d'une bouée d'amarrage.

« SOLAS » "SOLAS"
« SOLAS » La Convention internationale de 1974 pour la sauvegarde de la vie humaine en mer et le Protocole de 1988 relatif à la Convention, avec leurs modifications successives.

« zone NORDREG » "NORDREG Zone"
« zone NORDREG » La zone de services de trafic maritime du Nord canadien créée en vertu de l'article 2.

ZONE DE SERVICES DE TRAFIC MARITIME DU NORD CANADIEN

Zone de services de trafic maritime

2. La zone de services de trafic maritime du Nord canadien est créée par le présent article et est composée des zones et des eaux suivantes :

a) les zones de contrôle de la sécurité de la navigation prescrites par le *Décret sur les zones de contrôle de la sécurité de la navigation*;

b) les eaux de la baie d'Ungava, de la baie d'Hudson et de la baie Kugmallit

(*d*) the waters of the Koksoak River from Ungava Bay to Kuujjuaq;

(*e*) the waters of Feuilles Bay from Ungava Bay to Tasiujaq;

(*f*) the waters of Chesterfield Inlet that are not within a shipping safety control zone, and the waters of Baker Lake; and

(*g*) the waters of the Moose River from James Bay to Moosonee.

d) les eaux de la rivière Koksoak, de la baie d'Ungava à Kuujjuaq;

e) les eaux de la baie Feuilles, de la baie d'Ungava à Tasiujaq;

f) les eaux de la baie Chesterfield qui ne sont pas situées dans une zone de contrôle de la sécurité de la navigation et les eaux du lac Baker;

g) les eaux de la rivière Moose, de la baie James à Moosonee.

PRESCRIBED CLASSES OF VESSELS

Subsections 126(1) and (3) of the Act

3. The following vessels are prescribed as classes of vessels for the purposes of subsections 126(1) and (3) of the Act in respect of the NORDREG Zone:

(*a*) vessels of 300 gross tonnage or more;

(*b*) vessels that are engaged in towing or pushing another vessel, if the combined gross tonnage of the vessel and the vessel being towed or pushed is 500 gross tonnage or more; and

(*c*) vessels that are carrying as cargo a pollutant or dangerous goods, or that are engaged in towing or pushing a vessel that is carrying as cargo a pollutant or dangerous goods.

CATÉGORIES RÉGLEMENTAIRES DE BÂTIMENTS

Paragraphes 126(1) et (3) de la Loi

3. Les bâtiments ci-après constituent des catégories réglementaires pour l'application des paragraphes 126(1) et (3) de la Loi à l'égard de la zone NORDREG :

a) les bâtiments d'une jauge brute de 300 ou plus;

b) les bâtiments qui remorquent ou poussent un autre bâtiment lorsque les jauges brutes combinées du bâtiment et du bâtiment remorqué ou poussé sont de 500 ou plus;

c) les bâtiments qui transportent, comme cargaison, un polluant ou des marchandises dangereuses, ou les bâtiments qui remorquent ou poussent un bâtiment qui transporte, comme cargaison, un polluant ou des marchandises dangereuses.

OBLIGATION

Master

4. The master of a vessel of a class prescribed by section 3 must ensure that the

OBLIGATION

Capitaine

4. Le capitaine d'un bâtiment faisant partie d'une catégorie réglementaire prévue à l'article 3 veille à ce que les exigences

requirements of sections 5 to 10 are met in respect of the vessel.

REPORTS

Type of report

5. (1) Every report required by any of sections 6 to 9 must begin with the term "NORDREG" and be followed by whichever of the following two letters corresponds to the report:

(*a*) "SP", in the case of a sailing plan report;

(*b*) "PR", in the case of a position report;

(*c*) "FR", in the case of a final report;

(*d*) "DR", in the case of a deviation report.

Content of report

(2) The report must include the applicable designators required by sections 6 to 9 and set out in column 1 of the schedule, followed by the information that is about the subject set out in column 2 and that is specified in column 3.

Sailing plan report

6. (1) A sailing plan report must be provided

(*a*) when a vessel is about to enter the NORDREG Zone;

(*b*) more than one hour but not more than two hours before a vessel departs from a berth within the NORDREG Zone, unless the vessel is moving to another berth in the same port; and

(*c*) immediately before a vessel gets underway within the NORDREG Zone, if the vessel

(i) has been stranded,

(ii) has stopped as a result of a breakdown in the main propulsion or steering system, or

des articles 5 à 10 soient respectées à l'égard du bâtiment.

COMPTES RENDUS

Types de compte rendu

5. (1) Tout compte rendu exigé aux articles 6 à 9 commence par la mention « NORDREG », suivie d'une des combinaisons de deux lettres ci-après correspondant à celui-ci :

a) « SP », dans le cas du plan de route;

b) « PR », dans le cas du compte rendu de position;

c) « FR », dans le cas du compte rendu final;

d) «DR », dans le cas du compte rendu de déviation.

Contenu des comptes rendus

(2) Le compte rendu comprend les indicatifs applicables exigés par les articles 6 à 9 et prévus à la colonne 1 de l'annexe, suivis des renseignements portant sur les sujets prévus à la colonne 2 et qui sont précisés à la colonne 3.

Compte rendu du plan de route

6. (1) Un compte rendu du plan de route est présenté :

a) quand un bâtiment est sur le point d'entrer dans la zone NORDREG;

b) plus d'une heure, mais au plus deux heures, avant qu'un bâtiment quitte un poste d'amarrage dans la zone NORDREG, sauf s'il se rend à un autre poste d'amarrage dans le même port;

c) immédiatement avant de faire route dans la zone NORDREG si le bâtiment :

(i) s'est échoué,

(ii) s'est arrêté en raison d'une panne des systèmes principaux de propulsion ou d'un appareil à gouverner,

(iii) a été impliqué dans un abordage.

(iii) has been involved in a collision.

Designators

(2) The sailing plan report must include

(*a*) in the circumstances set out in paragraph (1)(*a*), the designators A, B, either C or D, E, F, G, H, I, L, O, P, Q, S, T, W and X;

(*b*) in the circumstances set out in paragraph (1)(*b*), the designators A, B, either C or D, H, I, L, O, P, Q, S, T, W and X; and

(*c*) in the circumstances set out in paragraph (1)(*c*), the designators A, B, either C or D, I, L, O, P, Q, S, T, W and X.

Indicatifs

(2) Le compte rendu du plan de route comprend :

a) dans les circonstances prévues à l'alinéa (1)*a*), les indicatifs A, B, C ou D, selon le cas; E, F, G, H, I, L, O, P, Q, S, T, W et X;

b) dans les circonstances prévues à l'alinéa (1)*b*), les indicatifs A, B, C ou D, selon le cas; H, I, L, O, P, Q, S, T, W et X;

c) dans les circonstances prévues à l'alinéa (1)*c*), les indicatifs A, B, C ou D, selon le cas; I, L, O, P, Q, S, T, W et X.

Exception to paragraph (2)(*a*)

(3) If the vessel is about to enter the NORDREG Zone directly from the Eastern Canada Vessel Traffic Services Zone and has obtained a clearance issued under paragraph 126(3)(*a*) of the Act with respect to that zone, the designators O, Q and T do not need to be included.

Exception à l'alinéa (2)*a*)

(3) Si le bâtiment est sur le point d'entrer dans la zone NORDREG directement à partir de la zone de services de trafic maritime de l'Est du Canada et a obtenu une autorisation de mouvement donnée en vertu de l'alinéa 126(3)*a*) de la Loi à l'égard cette zone, les indicatifs O, Q et T n'ont pas à être indiqués.

Exception to paragraphs (2)(*b*) and (*c*)

(4) In the case of a report required by paragraph (1)(*b*) or (*c*), the designators O, P, Q, S, T, W and X do not need to be included if the corresponding information specified in column 3 of the schedule has not changed since the previous sailing plan report.

Exception aux alinéas (2)*b*) et *c*)

(4) Dans le cas d'un compte rendu exigé aux alinéas (1)*b*) ou *c*), les indicatifs O, P, Q, S, T, W et X n'ont pas à être indiqués si les renseignements qui correspondent à ces indicatifs et qui sont précisés à la colonne 3 de l'annexe n'ont pas changé depuis le précédent compte rendu du plan de route.

Position report

7. (1) A position report must be provided

(*a*) immediately after a vessel enters the NORDREG Zone; and

(*b*) daily at 1600 Coordinated Universal Time (UTC), if a vessel is underway within the NORDREG Zone, unless the information required by regulation 19-1, Long-range identification and tracking of ships, of Chapter V of SOLAS, is be-

Compte rendu de position

7. (1) Un compte rendu de position est présenté :

a) immédiatement après que le bâtiment entre dans la zone NORDREG;

b) quotidiennement à 16 h 00 Temps universel coordonné (UTC), si le bâtiment fait route dans la zone NORDREG, à moins que les renseignements exigés par la règle 19-1 du chapitre V de SOLAS (Identification et suivi des navires à

ing transmitted in accordance with that regulation.

grande distance) ne soient transmis conformément à cette règle.

Additional position report

(2) A position report must also be provided as soon as feasible after a vessel's master becomes aware of any of the following, if the vessel is within or about to enter the NORDREG Zone:

(*a*) another vessel in apparent difficulty;

(*b*) any obstruction to navigation;

(*c*) an aid to navigation that is not functioning properly or is damaged, out of position or missing;

(*d*) any ice or weather conditions that are hazardous to safe navigation; and

(*e*) a pollutant in the water.

Compte rendu de position supplémentaire

(2) Un compte rendu de position est présenté dès que possible après que le capitaine du bâtiment est au courant de l'une ou l'autre des circonstances ci-après, si le bâtiment est sur le point d'entrer dans la zone NORDREG ou s'y trouve :

a) un autre bâtiment est apparemment en difficulté;

b) il y a un obstacle à la navigation;

c) une aide à la navigation ne fonctionne pas de manière appropriée, est endommagée, n'est plus à sa position ou est manquante;

d) les conditions de glace ou les conditions climatiques compromettent la sécurité de la navigation;

e) un polluant est présent dans l'eau.

Designators

(3) The position report must include the following designators:

(*a*) A, B, either C or D, E, F and S; and

(*b*) X, in the case of a position report required by subsection (2).

Indicatifs

(3) Le compte rendu de position comprend les indicatifs suivants :

a) A, B, C ou D, selon le cas, E, F, S;

b) X, dans le cas d'un compte rendu exigé au paragraphe (2).

Final report

8. (1) A final report must be provided

(*a*) on the arrival of a vessel at a berth within the NORDREG Zone; and

(*b*) immediately before a vessel exits the NORDREG Zone.

Compte rendu final

8. (1) Un compte rendu final est présenté :

a) à l'arrivée du bâtiment à un poste d'amarrage dans la zone NORDREG;

b) immédiatement avant que le bâtiment sorte de la zone NORDREG.

Designators

(2) The final report must include the designators A and K.

Indicatifs

(2) Le compte rendu final comprend les indicatifs A et K.

Deviation report

9. (1) A deviation report must be provided when

(*a*) a vessel's position varies significantly from the position that was expected based on the sailing plan report; or

Compte rendu de déviation

9. (1) Un compte rendu de déviation est présenté dans les cas suivants :

a) la position du bâtiment varie de façon significative de la position qui était pré-

(*b*) a vessel's intended voyage changes from the sailing plan report.

b) un changement est effectué au voyage du bâtiment qui était prévu dans le plan de route.

vue d'après le compte rendu du plan de route;

Designators

(2) The deviation report must include

(*a*) the designators A, B, and either C or D; and

(*b*) the other designators included in the sailing plan report, if the corresponding information specified in column 3 of the schedule has changed since that report.

(2) Le compte rendu de déviation comprend :

a) les indicatifs A, B, et C ou D, selon le cas;

b) les autres indicatifs compris dans le compte rendu du plan de route dont les renseignements correspondants précisés à la colonne 3 de l'annexe ont changés depuis ce compte rendu.

Indicatifs

Address of report

10. Every report must be addressed to NORDREG CANADA and be provided to one of the Marine Communications and Traffic Services Centres that is designated by the Canadian Coast Guard to receive the report.

10. Tout compte rendu est adressé à NORDREG CANADA et présenté à l'un des centres des Services de communication et de trafic maritimes désignés par la Garde côtière canadienne pour recevoir les comptes rendus.

Adresse des comptes rendus

COMING INTO FORCE

ENTRÉE EN VIGUEUR

July 1, 2010

11. These Regulations come into force on July 1, 2010.

11. Le présent règlement entre en vigueur le 1er juillet 2010.

1er juillet 2010

SCHEDULE
(Subsections 5(2), 6(4) and 9(2))
NORDREG INFORMATION

Item	Column 1 Designator	Column 2 Subject	Column 3 Information
1.	A	Vessel	The vessel's name, the name of the state whose flag the vessel in entitled to fly and, if applicable, the vessel's call sign, International Maritime Organization ship identification number and Maritime Mobile Service Identity (MMSI) number.
2.	B	Date and time corresponding to the vessel's position under designator C or D given in Coordinated Universal Time (UTC)	A 6-digit group followed by a Z, the first 2 digits giving the day of the month, the next two digits giving the hour and the last two digits giving the minutes.
3.	C	Vessel's position by latitude and longitude	A 4-digit group giving the latitude in degrees and minutes suffixed with N, and a 5-digit group giving the longitude in degrees and minutes suffixed with W.
4.	D	Vessel's position by geographical name of place	If the vessel is at a known place, the name of the place. If the vessel is not at a known place, the name of a known place followed by the vessel's true bearing (3-digits) and distance in nautical miles from the place.
5.	E	Vessel's course	The true course. A 3-digit group.
6.	F	Vessel's speed	The speed in knots. A 2-digit group.
7.	G	Vessel's last port of call	The name of the port of call.
8.	H	Vessel's entry into the NORDREG Zone or departure from a berth within the NORDREG Zone	The estimated date and time that the vessel will enter the NORDREG Zone or depart the berth within the NORDREG Zone, as appropriate, with the date and time expressed as for designator B and the entry or departure position expressed as for designator C or D.
9.	I	Vessel's destination and expected time of arrival	The name of the destination followed by the expected time of arrival, expressed as for designator B.

ANNEXE
(paragraphes 5(2), 6(4) et 9(2))
RENSEIGNEMENTS NORDREG

Article	Colonne 1 Indicatif	Colonne 2 Sujets	Colonne 3 Renseignements
1.	A	Bâtiment	Le nom du bâtiment, le nom de l'État sous le pavillon duquel le bâtiment est habilité à naviguer et, le cas échéant, l'indicatif d'appel radio, le numéro d'identification du navire attribué par l'Organisation maritime internationale et le numéro d'identification du service maritime mobile (ISMM) du bâtiment.
2.	B	Date et heure correspondant à la position sous l'indicatif C ou D donné en Temps universel coordonné (UTC)	Un groupe de six chiffres suivi de la lettre Z, les deux premiers chiffres donnant le jour du mois, les deux chiffres suivants donnant l'heure et les deux derniers chiffres donnant les minutes.
3.	C	Position du bâtiment selon la latitude et la longitude	Un groupe de quatre chiffres donnant la latitude en degrés et minutes, suivi de la lettre N, et un groupe de cinq chiffres donnant la longitude en degrés et minutes, suivi de la lettre W.
4.	D	Position du bâtiment selon le nom géographique de l'endroit	Si le bâtiment se trouve à un endroit connu, le nom de cet endroit ou, si le bâtiment se trouve à un endroit qui n'est pas connu, le nom d'un endroit connu, suivi de l'azimut vrai (trois chiffres) du bâtiment et de la distance en milles marins du bâtiment à partir de cet endroit.
5.	E	Cap du bâtiment	Route vraie. Un groupe de trois chiffres.
6.	F	Vitesse du bâtiment	Vitesse en nœuds. Un groupe de deux chiffres.
7.	G	Dernier port d'escale du bâtiment	Le nom du dernier port d'escale.
8.	H	Entrée du bâtiment dans la zone NORDREG ou de départ d'un poste d'amarrage dans cette zone	La date et l'heure estimatives de l'entrée d'un bâtiment dans la zone NORDREG ou du départ d'un poste d'amarrage dans cette zone, selon le cas. La date et l'heure exprimées de la manière prévue selon l'indicatif B et la position exprimée de la manière prévue selon l'indicatif C ou D.
9.	I	Destination du bâtiment et heure prévue d'arrivée	Le nom de la destination, suivi de l'heure prévue d'arrivée, exprimée de la manière prévue selon l'indicatif B.

Item	Column 1 Designator	Column 2 Subject	Column 3 Information
10.	K	Vessel's exit from the NORDREG Zone or arrival at the vessel's destination.	The date and time that the vessel exits the NORDREG Zone or arrives at its berth within the NORDREG Zone, with the exit date and time expressed as for designator B and the exit or arrival position expressed as for designator C or D.
11.	L	Vessel's intended route	A brief description of the intended route through the NORDREG Zone.
12.	O	Vessel's maximum present static draught	A 4-digit group giving metres and centimetres.
13.	P	Vessel's cargo	A brief description of the vessel's cargo and the cargo of any vessel being towed or pushed. The description must include (*a*) in the case of a dangerous good, the class and quantity; and (*b*) in the case of a pollutant, the technical name and quantity.
14.	Q	Defects, damage and deficiencies, as well as circumstances adversely affecting the vessel's normal navigation	Brief details regarding any defects, damage or deficiencies of the vessel or its machinery, equipment, or charts and nautical publications, and any circumstances that adversely affect normal navigation.
15.	S	Weather and ice	A brief description of the prevailing weather and ice conditions.
16.	T	Vessel's authorized representative, agent or owner	The name and contact information of (*a*) in the case of a Canadian vessel, its authorized representative; (*b*) in the case of a foreign vessel, its Canadian or American agent or its owner; and (*c*) in the case of a pleasure craft that is not a Canadian vessel, the pleasure craft's owner.
17.	W	Persons on board the vessel	The number of persons.

Article	Colonne 1 Indicatif	Colonne 2 Sujets	Colonne 3 Renseignements
10.	K	Sortie du bâtiment de la zone NORDREG ou arrivée du bâtiment à destination	La date et l'heure à laquelle le bâtiment sort de la zone NORDREG ou arrive à son poste d'amarrage dans cette zone. La date et l'heure de sortie de la zone NORDREG sont exprimées de la manière prévue selon l'indicatif B, et les positions de sortie ou d'arrivée sont exprimées de la manière prévue selon l'indicatif C ou D.
11.	L	Route prévue du bâtiment	Brève description de la route prévue dans la zone NORDREG.
12.	O	Tirant d'eau statique maximum du bâtiment	Un groupe de quatre chiffres exprimé en mètres et centimètres.
13.	P	Cargaison du bâtiment	Brève description de la cargaison du bâtiment et de la cargaison à bord de tout bâtiment remorqué ou poussé. Cette description comprend: *a*) dans le cas de marchandises dangereuses, la classe et la quantité; *b*) dans le cas d'un polluant, l'appellation technique et la quantité.
14.	Q	Défectuosités, dommages et lacunes, ainsi que les circonstances qui nuisent à la navigation normale du bâtiment	Brefs détails de toute défectuosité, de tout dommage ou de toute lacune touchant le bâtiment, ses machines, son équipement ou ses cartes marines et ses publications nautiques, et toute circonstance qui nuise à la navigation normale.
15.	S	Conditions climatiques et conditions de glace	Brève description des conditions climatiques et des conditions de glace existantes.
16.	T	Représentant autorisé, mandataire ou propriétaire du bâtiment	Le nom et les coordonnées des personnes suivantes: *a*) dans le cas d'un bâtiment canadien, le représentant autorisé du bâtiment; *b*) dans le cas d'un bâtiment étranger, le mandataire canadien ou américain de celui-ci ou son propriétaire; *c*) dans le cas d'une embarcation de plaisance qui n'est pas un bâtiment canadien, le propriétaire de l'embarcation de plaisance.
17.	W	Personnes à bord du bâtiment	Nombre de personnes.

Item	Column 1 Designator	Column 2 Subject	Column 3 Information
18.	X	(*a*) In the case of a sailing plan report, (i) the amount of oil on board that is for use as fuel or carried as cargo; (ii) if the vessel's owner or master holds an arctic pollution prevention certificate in respect of the vessel, the certificate; (iii) the vessel's ice class, if applicable; and (iv) if the report is referred to in paragraph 6(1)(*c*) of the Regulations, the applicable incident referred to in that paragraph. (*b*) In the case of a position report referred to in subsection 7(2) of the Regulations, the applicable matter referred to in that subsection.	(*a*) The following information: (i) the total amount of oil, expressed in cubic metres; (ii) the certificate's expiry date and the name of its issuing authority; (iii) the vessel's ice class and the name of the classification society that assigned the ice class; and (iv) a brief description of the applicable incident. (*b*) A brief description of the applicable matter.

Article	Colonne 1 Indicatif	Colonne 2 Sujets	Colonne 3 Renseignements
18.	X	*a*) Dans le cas d'un compte rendu du plan de route : (i) la quantité d'hydrocarbures à bord, comme carburant ou cargaison, (ii) si le propriétaire du bâtiment ou son capitaine est titulaire d'un certificat de prévention de la pollution dans l'Arctique à l'égard de ce bâtiment, ce certificat, (iii) la cote de glace de ce bâtiment, le cas échéant, (iv) si ce compte rendu est visé à l'alinéa 6(1)*c*) du présent règlement, l'incident applicable visé à cet alinéa. *b*) Dans le cas d'un compte rendu de position visé au paragraphe 7(2) du présent règlement, la matière applicable visée à ce paragraphe.	*a*) Les renseignements suivants : (i) la quantité totale d'hydrocarbures, exprimée en mètres cubes, (ii) la date d'expiration de ce certificat et le nom de l'autorité qui a délivré le certificat, (iii) la cote de glace de ce bâtiment et le nom de la société de classification qui a attribué la cote de glace, (iv) une brève description de l'incident visé. *b*) Une brève description de la matière visée.

Ballast Water Exchange

Vessels proceeding into Canadian waters must send the necessary forms to the address below:

- iganordreg@innav.gc.ca

Pre-arrival Information

The 72 hours ETA (Local time and date Milne Inlet Port) shall contain the following pre-arrival information which must correlate to the below line numbers:

All Ships:

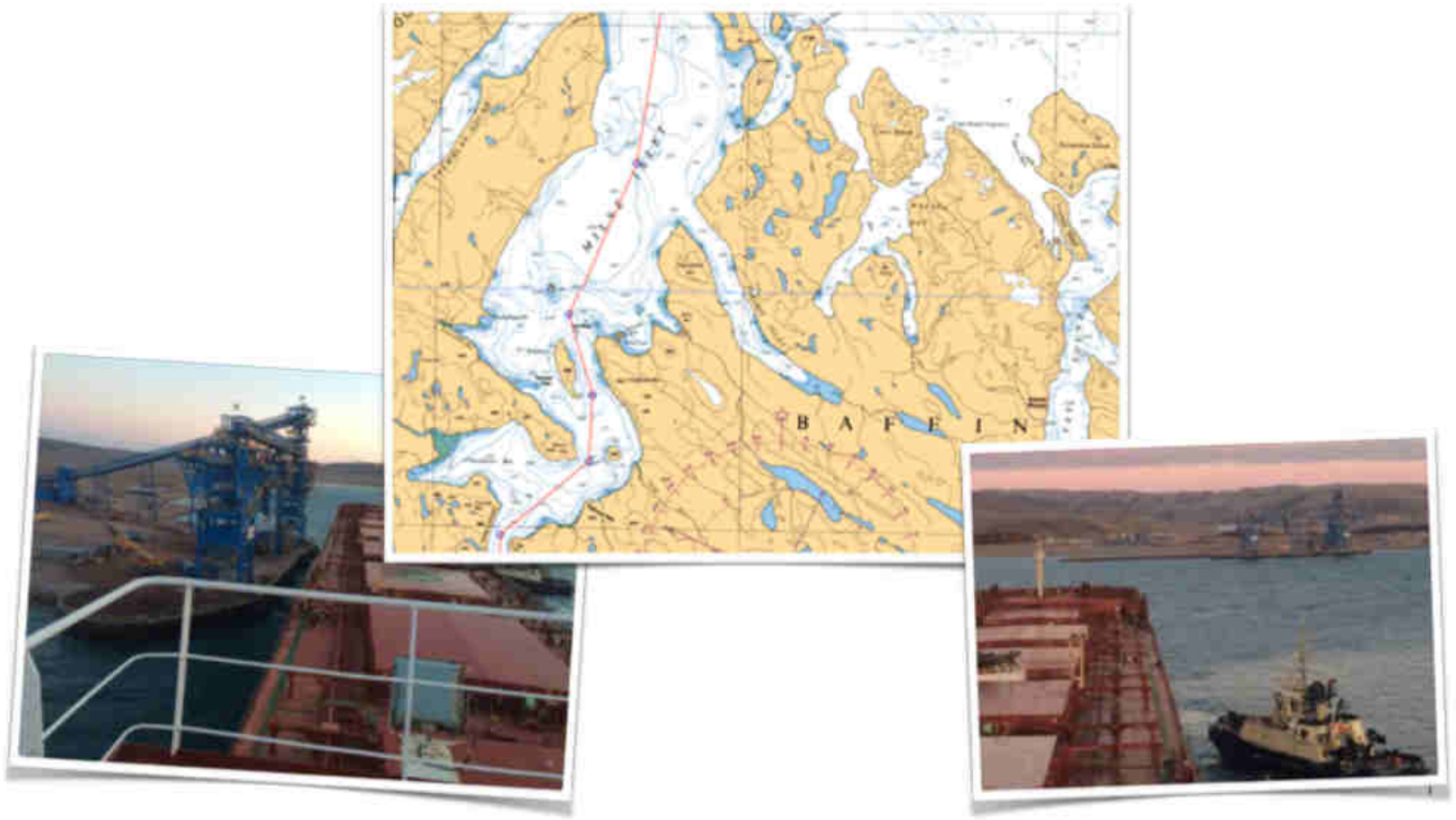
1. Name of ship, port of registry and flag
2. Call sign and IMO Number
3. Name of Master
4. Vessel LOA/Beam/Light Displacement/Summer Draft/SDWT/GRT/NRT
5. Number of cargo holds
6. Name and address of responsible ship owner
7. Name and telephone number of contact person on board
8. ISSC number
9. Status regarding ISPS – certification and security level
10. Crew list
11. Last 10 ports of call
12. Arrival and estimated sailing drafts
13. Grade(s) and quantities to be loaded
14. Holdwise Stowage Plan
15. BLU Code Loading Plan with hold loading sequence for two shiploaders
16. The last cargo
17. Time required for de-ballasting
18. Distance from waterline to top of hatcover in open position
19. Distance from end hatch #1 to aft end of aft most hatch
20. Number and kind of mooring lines

APPENDIX 4 – NAVIGATION INFORMATION

Milne Inlet Route Information

Milne Inlet Route Information

Photographs and Chart Captures



Notes

1. This shows the inbound route followed by MV Golden Ice on August 11, 2015
2. Ice conditions: bergy water and less than 1/10 sea ice.
3. All charts are north up.
4. Two bergs bearing down on the ship while at the terminal required diverting by use of a tug.

Acknowledgements

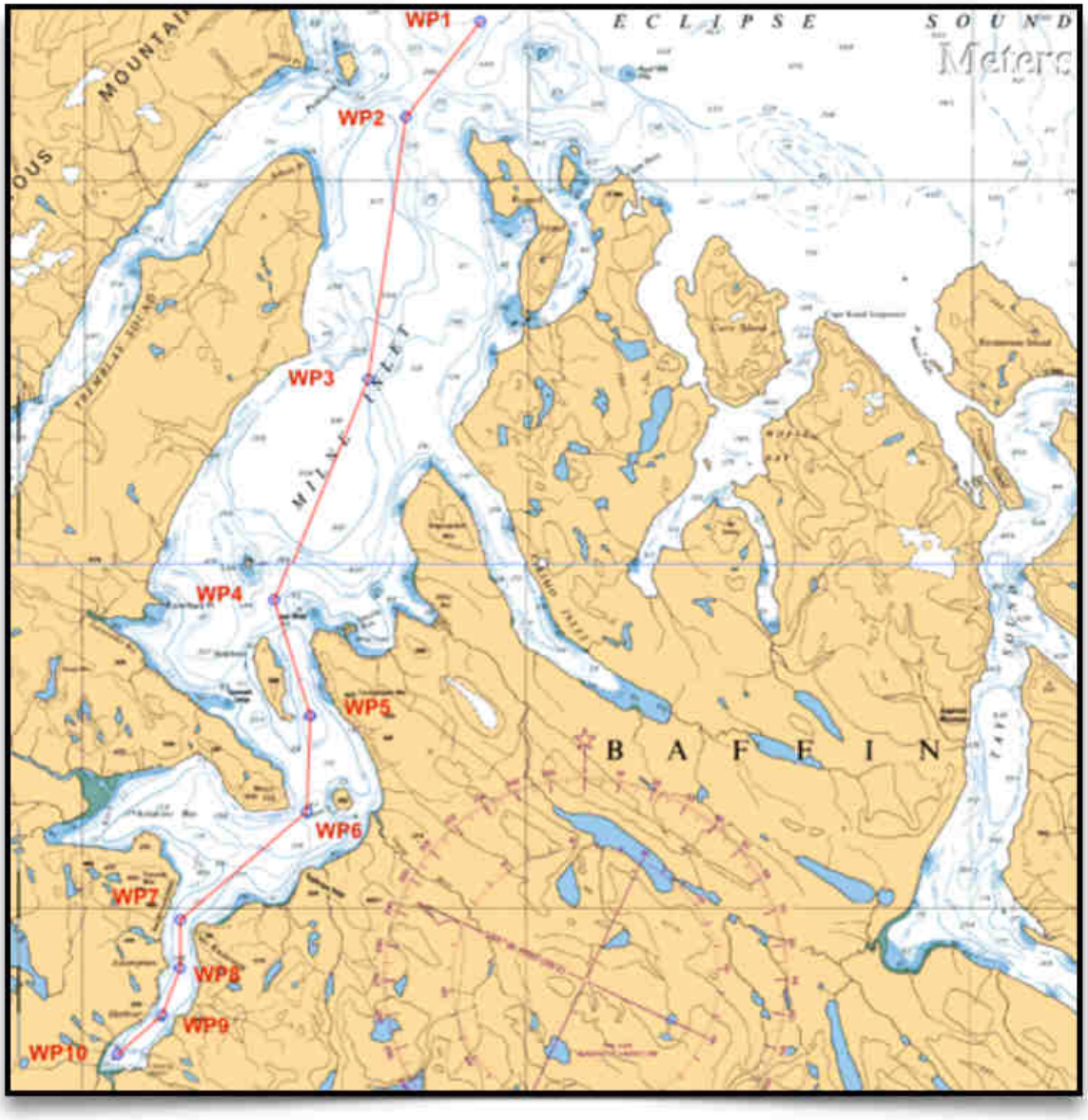
- Compiled by Capt. David Fowler, Ice Navigator, MV Golden Ice
- With thanks to Capt. Rosbillo Bilbao, Officers and Crew of MV Golden Ice
- Photographs by:
    - Capt. Rosbillo Bilbao and Officers, MV Golden Ice
    - Capt. Philip Grandy, Ice Navigator, MV Nordic Odin
    - Capt. John F. Cowan, June 2013, Fednav publication
    - Capt. David Fowler, Ice Navigator, MV Golden Ice

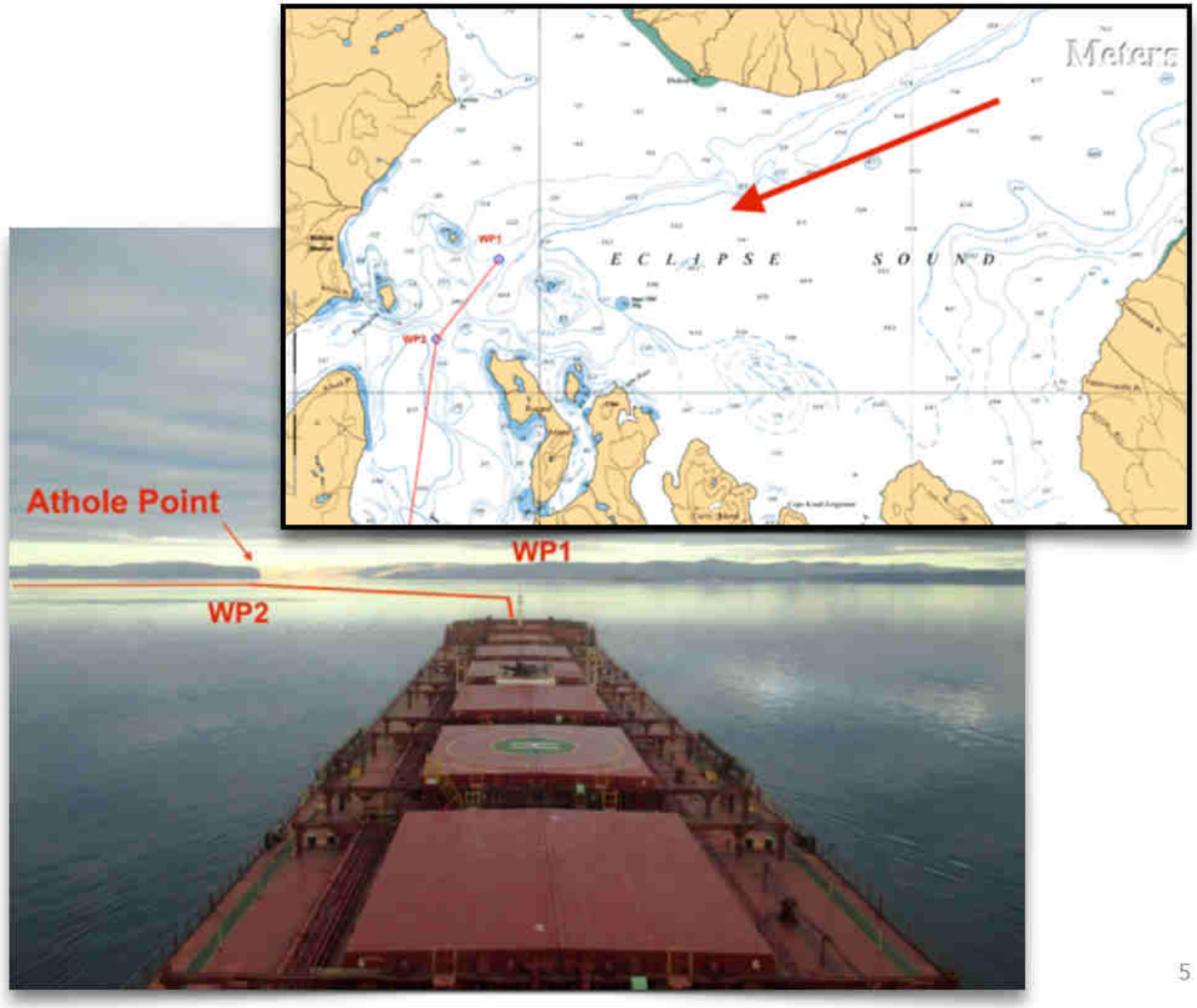
Route Followed

Milne Inlet

Waypoints

Leg	To Waypoint	Distance	Bearing	Latitude	Longitude	ETE	Speed	Course
---	WP1 Milne Entrance			72 36.6 N	080 06.1 W	Start	9.00	218 Deg...
1	WP2 Ragged Island	5.05 NMi	218 Deg. T	72 32.6 N	080 16.5 W	00 H 33 M	9.00	188 Deg...
2	WP3 Eskimo Inlet	10.81 NMi	188 Deg. T	72 21.9 N	080 21.5 W	01 H 45 M	9.00	202 Deg...
3	WP4 Lone Shoal	9.84 NMi	202 Deg. T	72 12.8 N	080 33.8 W	02 H 51 M	9.00	163 Deg...
4	WP5 Stephens Island South	5.02 NMi	163 Deg. T	72 08.0 N	080 29.0 W	03 H 24 M	9.00	182 Deg...
5	WP6 Bruce Head	4.00 NMi	182 Deg. T	72 04.0 N	080 29.5 W	03 H 51 M	9.00	229 Deg...
6	WP7 Cape Kwaunang	6.91 NMi	229 Deg. T	71 59.5 N	080 46.5 W	04 H 37 M	9.00	180 Deg...
7	WP8 Assomption Hbr	2.00 NMi	180 Deg. T	71 57.5 N	080 46.5 W	04 H 50 M	9.00	201 Deg...
8	WP9 Terminal Approach	2.15 NMi	201 Deg. T	71 55.5 N	080 49.0 W	05 H 05 M	9.00	228 Deg...
9	WP10 Anchorage	2.47 NMi	228 Deg. T	71 53.9 N	080 54.9 W	05 H 21 M	9.00	----


WP1
WP2
WP3
WP4
WP5
WP6
WP7
WP8
WP9
WP10
ECLIPSE SOUND
Meters
MILNE INLET
BAFFIN



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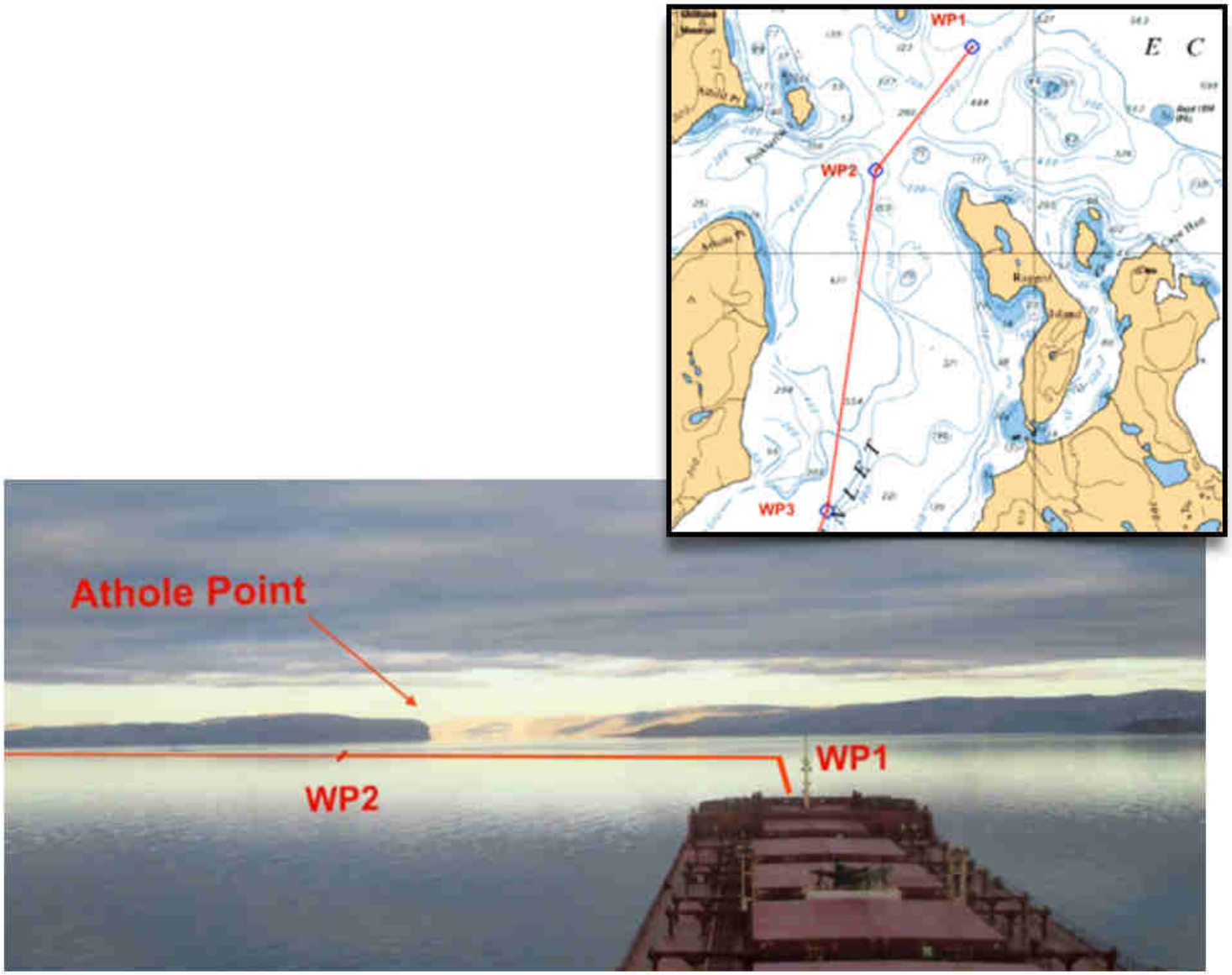
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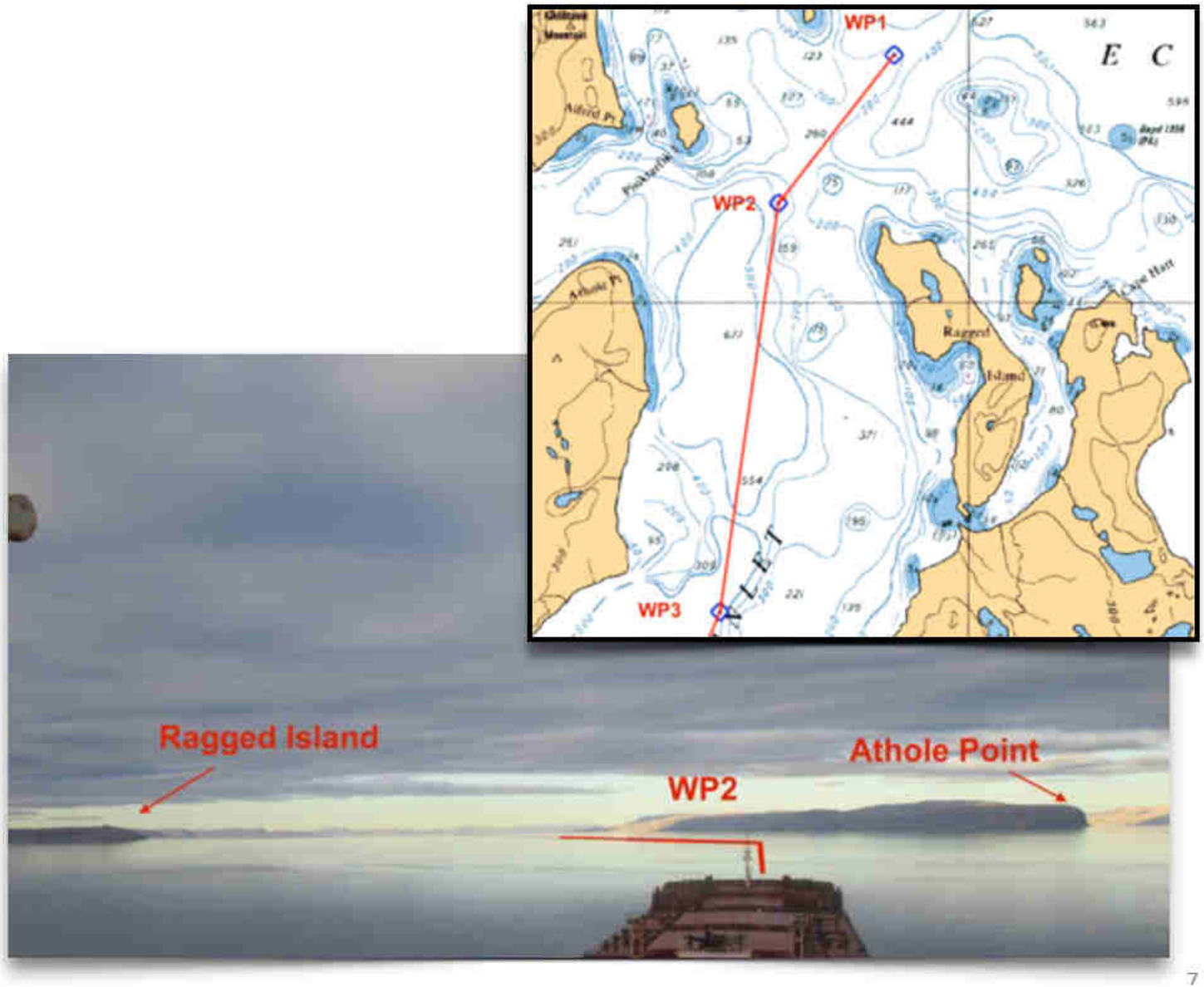
WP2
WP3
Athole Point
WP2
WP1



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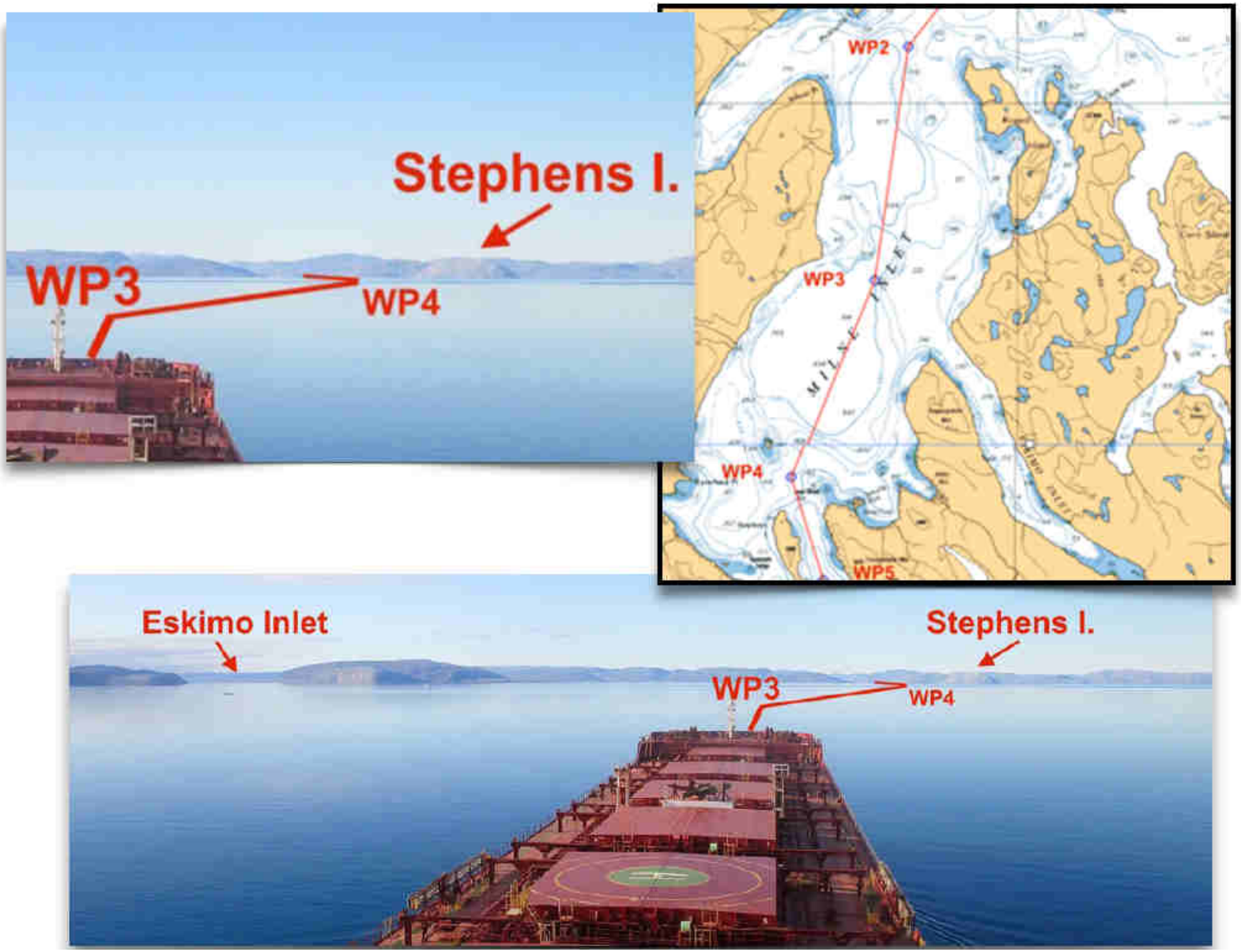
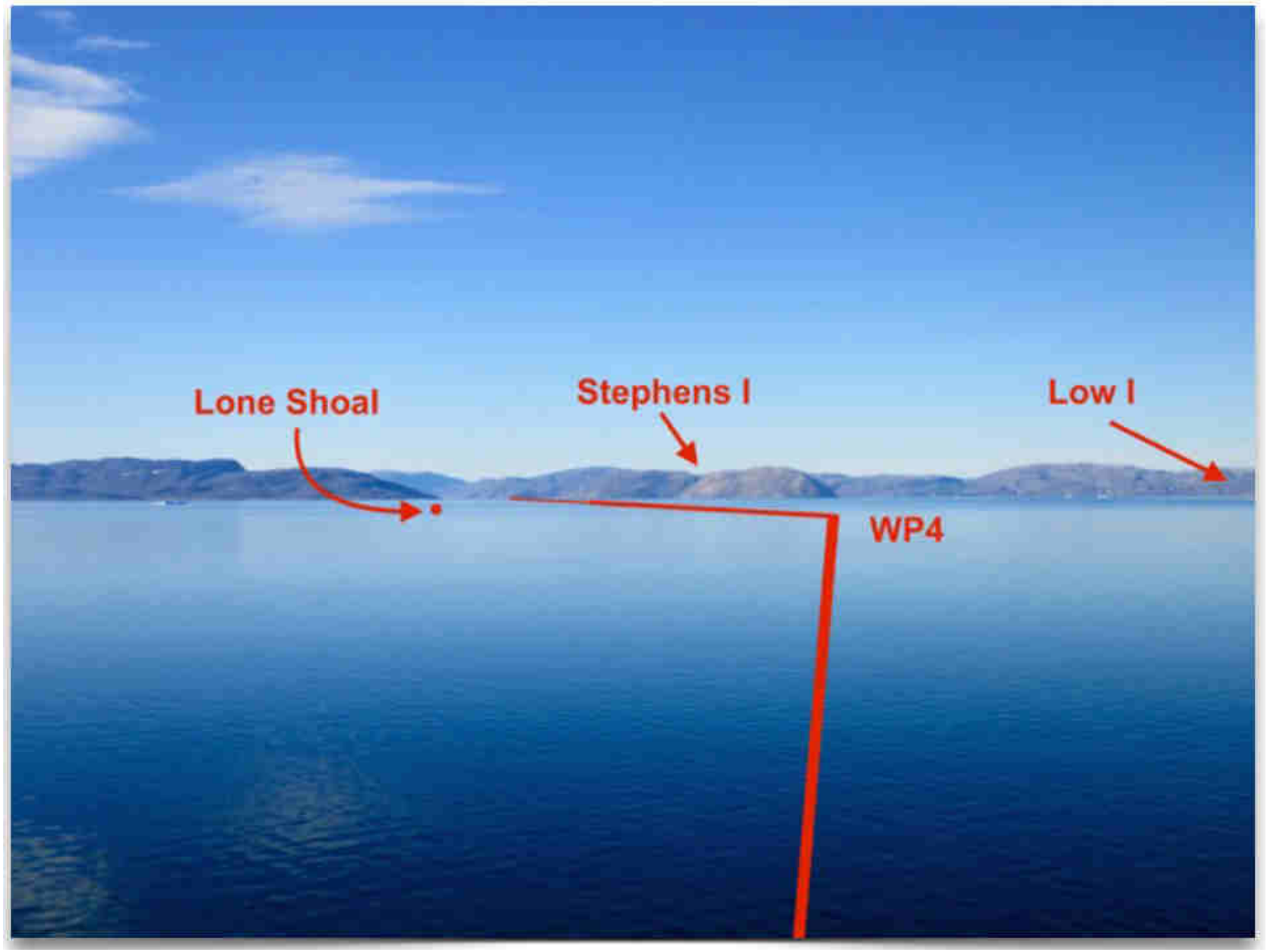
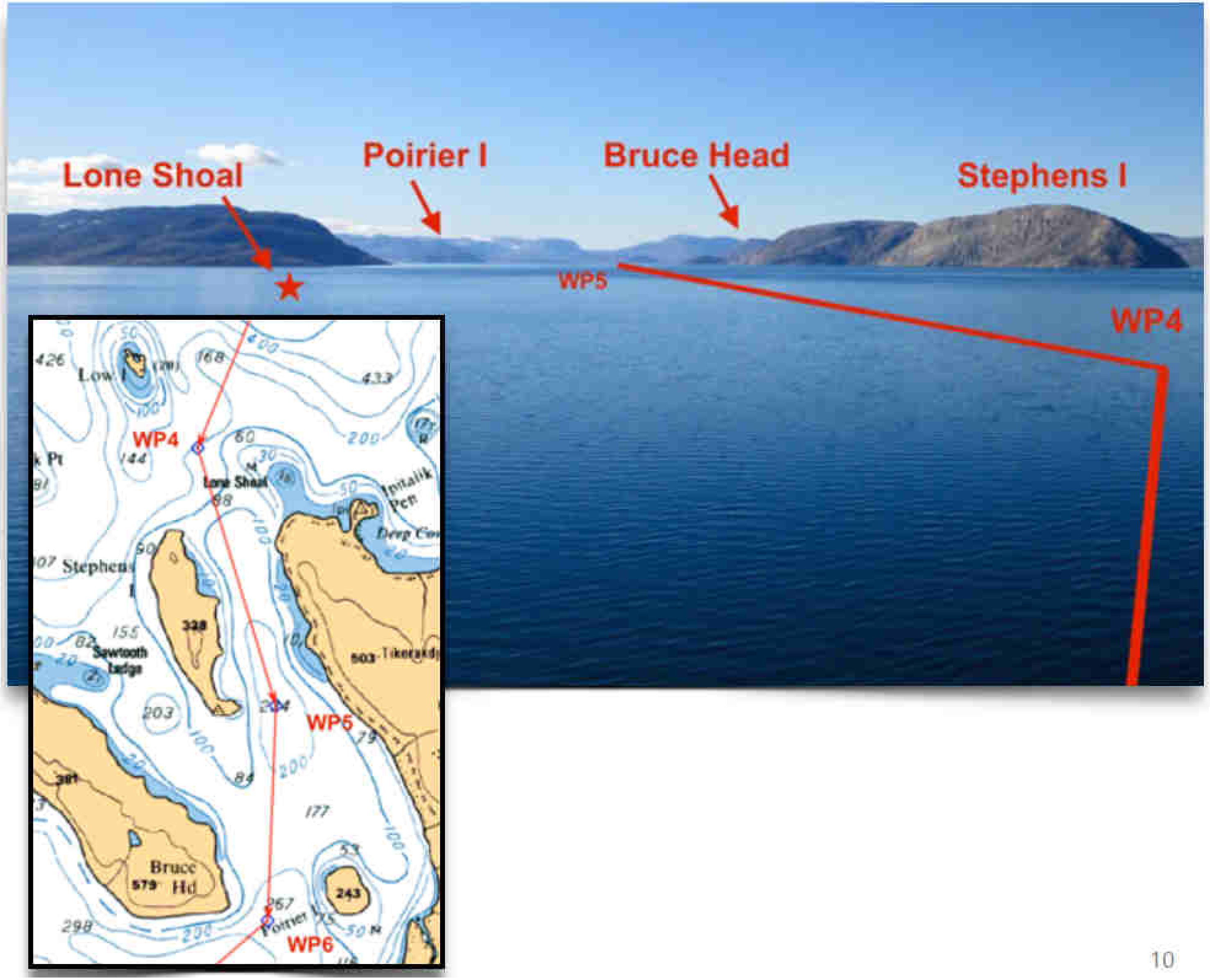

Stephens I.
WP3
WP4
WP2
WP3
MILNE INLET
WP4
WP5
Eskimo Inlet
Stephens I.
WP3
WP4


Lone Shoal
Stephens I
Low I
WP4


Lone Shoal
Poirier I
Bruce Head
Stephens I
WP5
WP4
WP4
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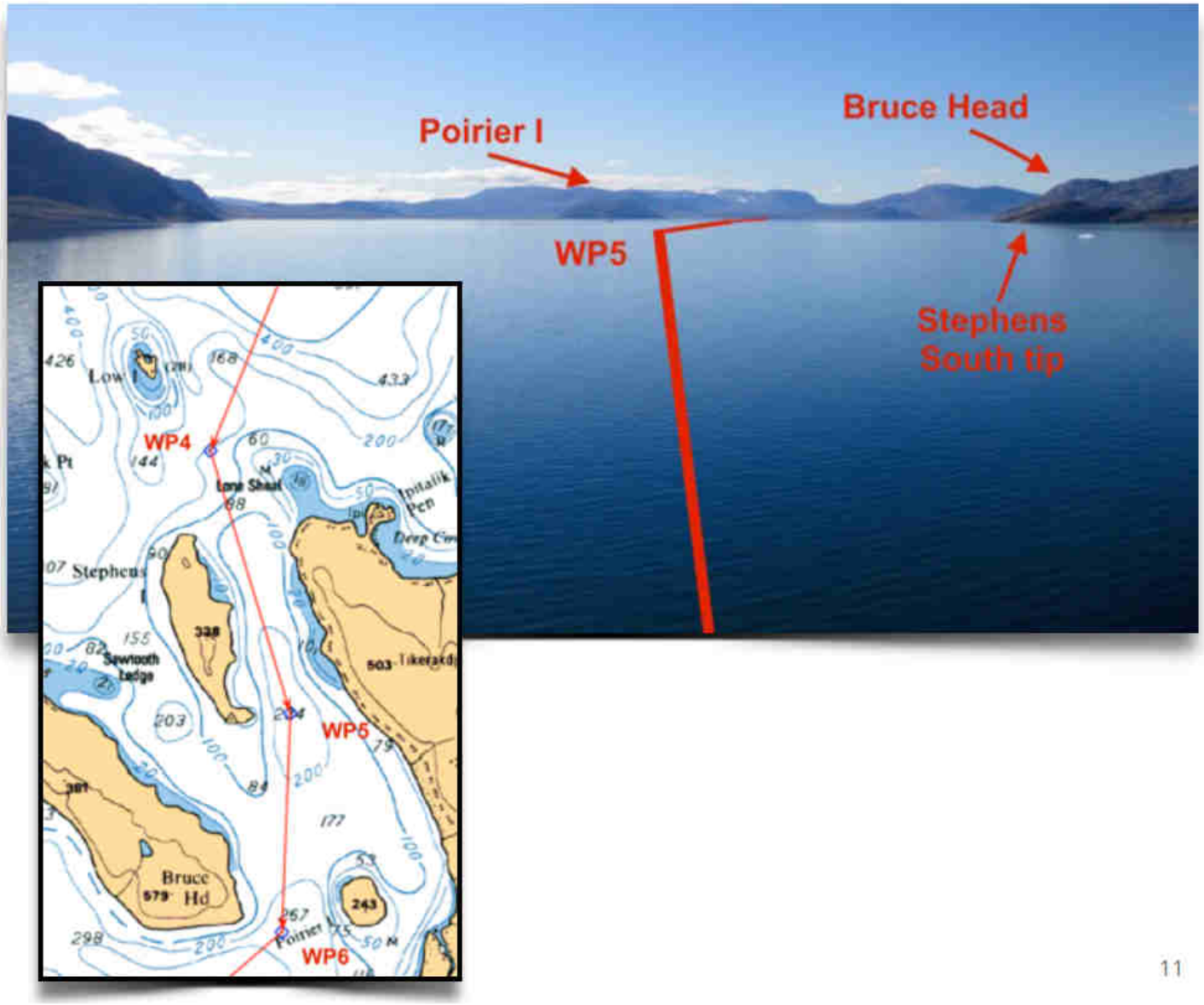
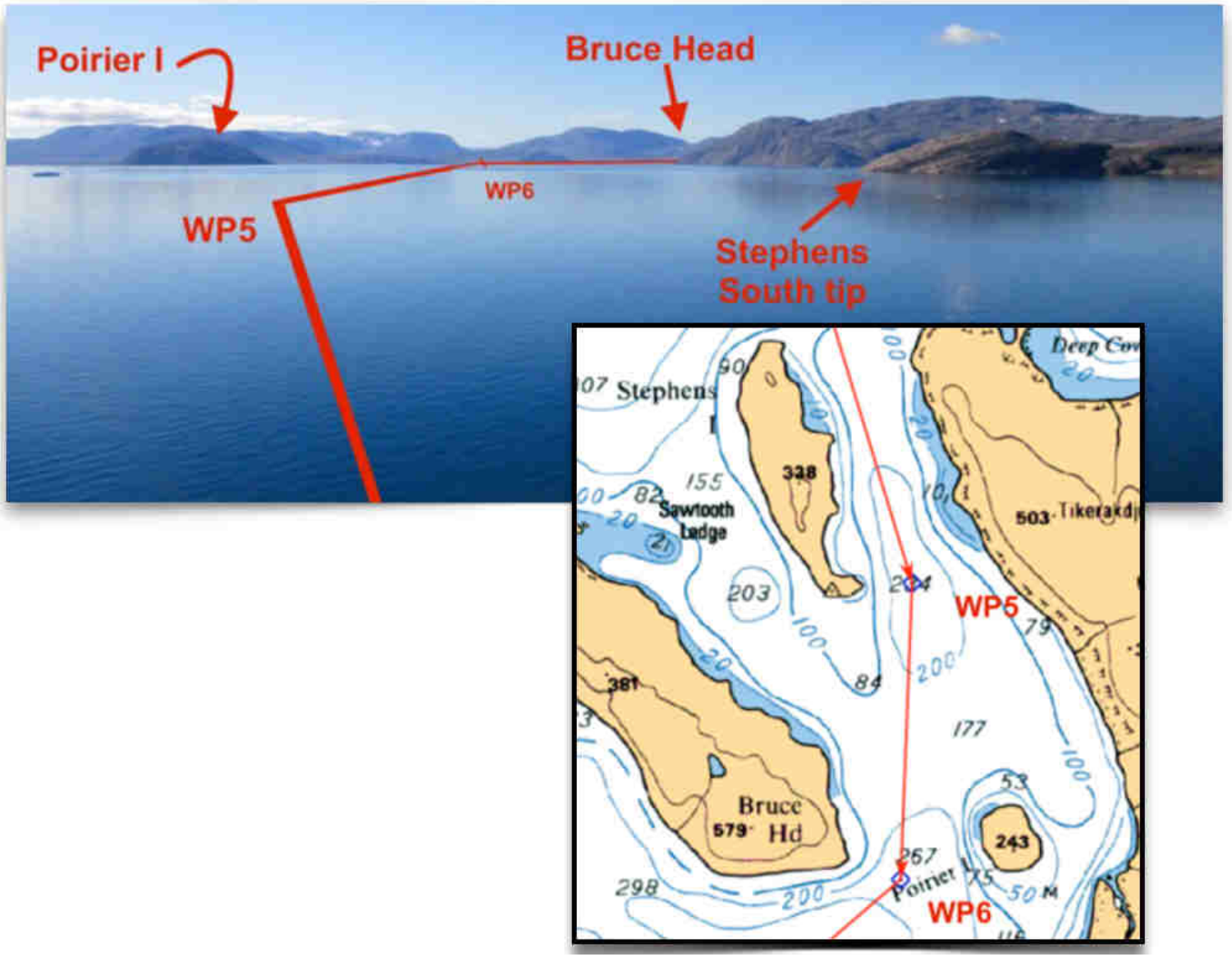
Lone Shoal
Stephens
Sawtooth Ledge
WP5
Bruce
Hd
WP6

10


Poirier I
Bruce Head
WP5
Stephens
South tip
WP4
WP5
WP6
Bruce
Hd
Stephens
Sawtooth
Ledge
Low I
Pt
Lone Shoal
Ipitalik
Pen
Deep Cove
Ikerasak
11


Poirier I
Bruce Head
WP6
WP5
Stephens
South tip
Stephens
338
Sawtooth
Ledge
503
203
WP5
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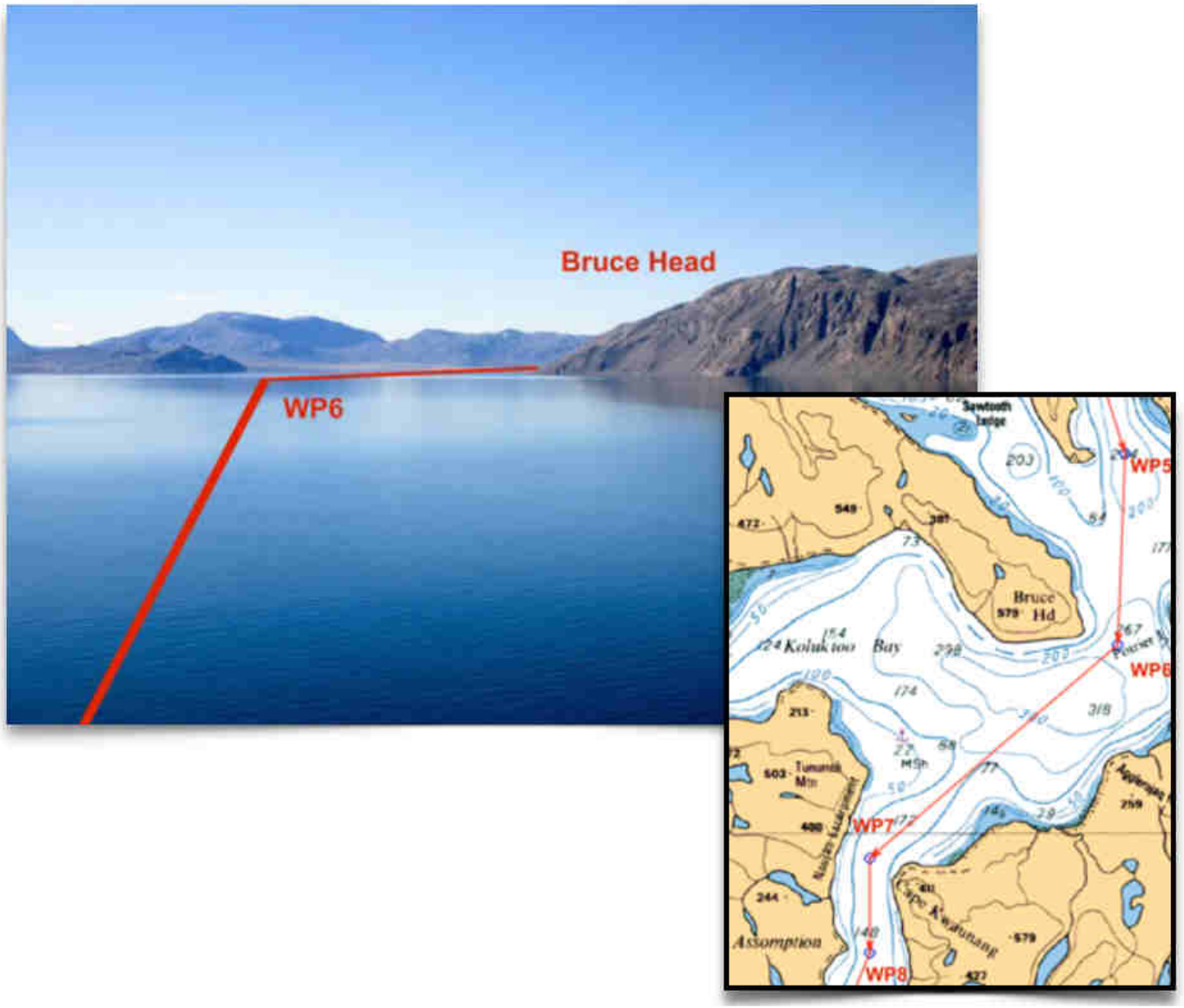
Bruce
579
Hd
243
267
Poirier
WP6
298
200
177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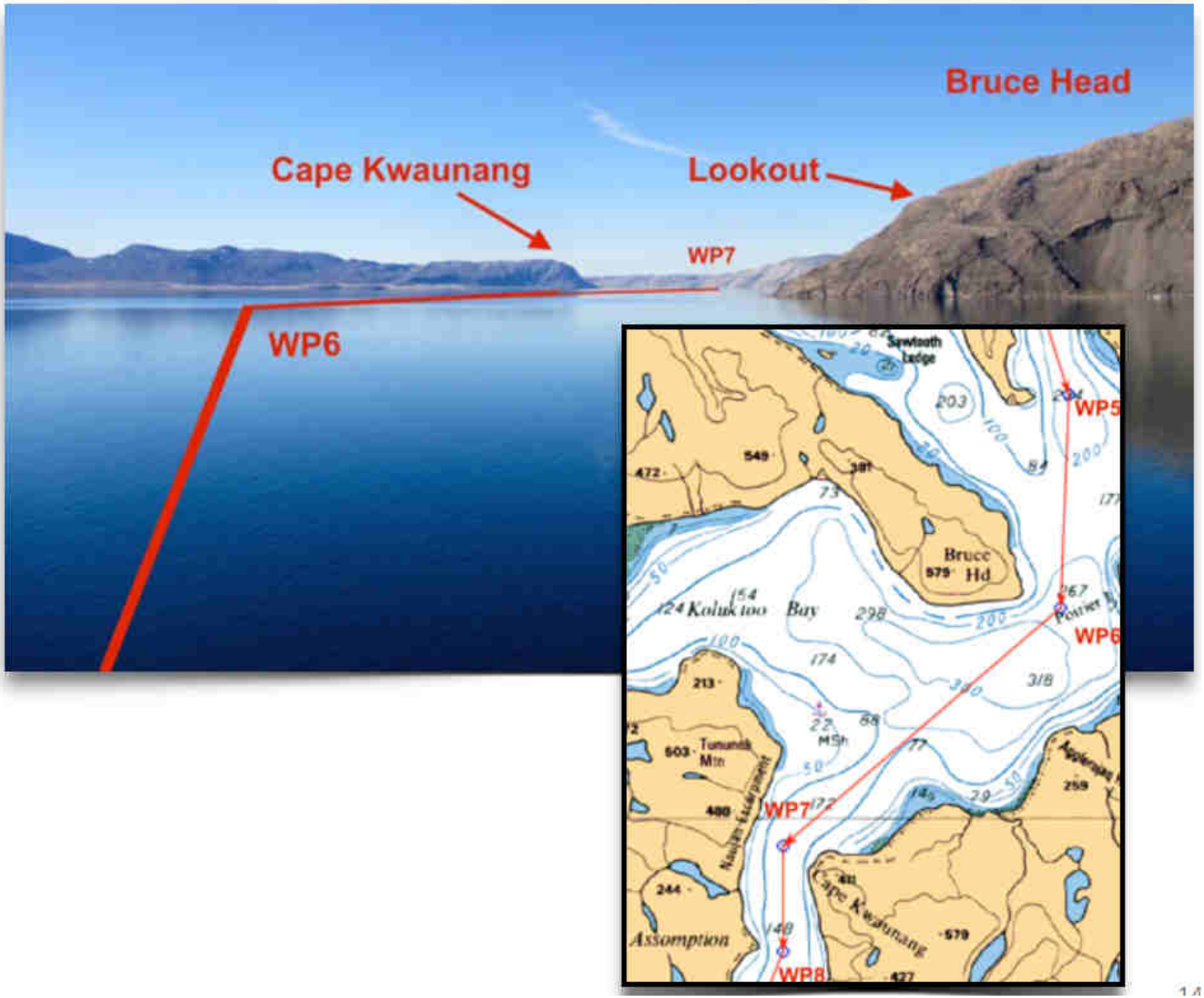
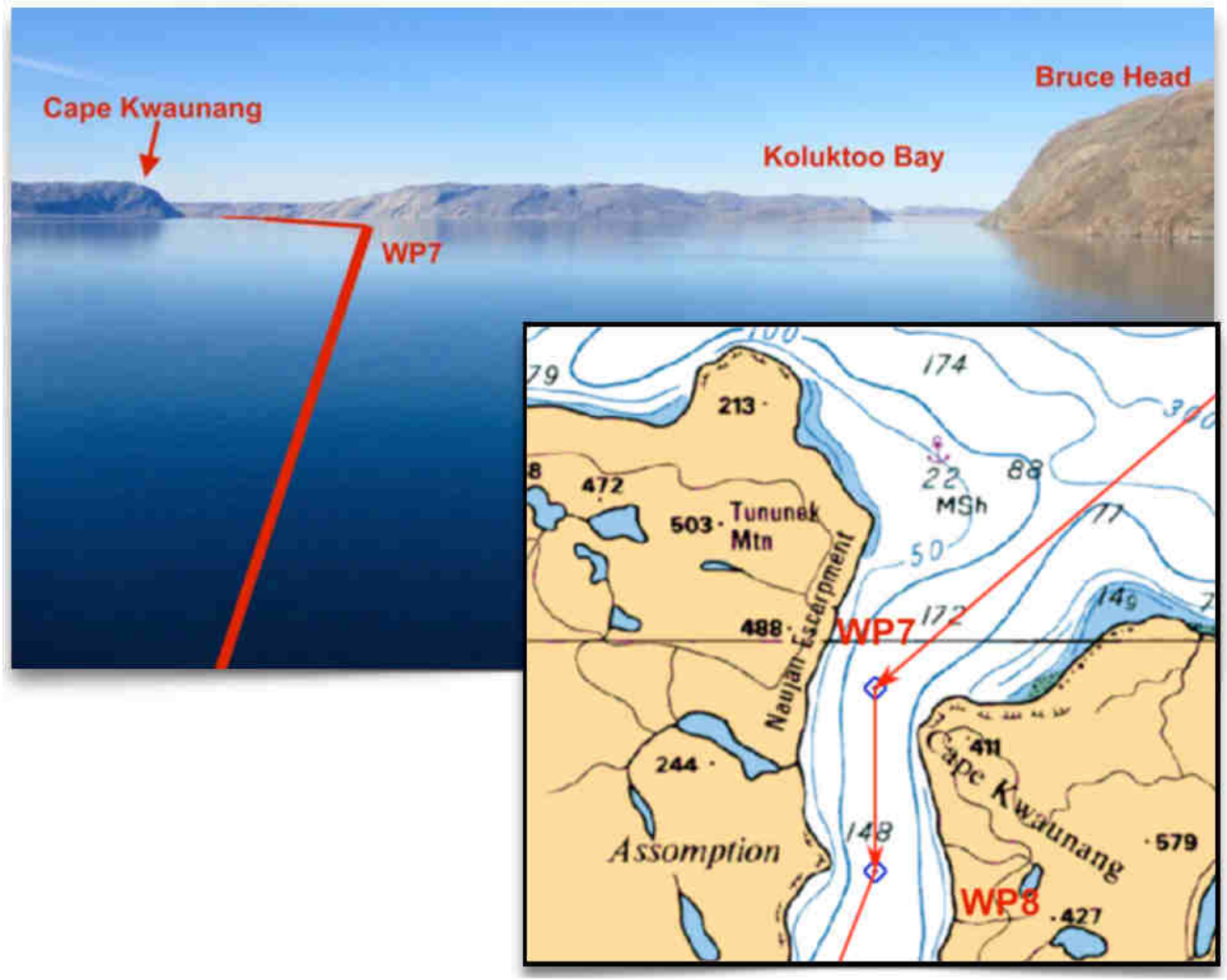
WP6
WP5
WP6
WP7
WP8
Bruce Hd
Bay
Assomption


Bruce Head
Cape Kwaunang
Lookout
WP7
WP6
WP5
WP6
WP7
WP8
Bruce Hd
Assomption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Bruce Head
Koluktoo Bay
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503
Tununek Mtn
488
Naujan Escarpment
WP7
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Assomption
148
411
Cape Kwaunang
579
WP8
427
174
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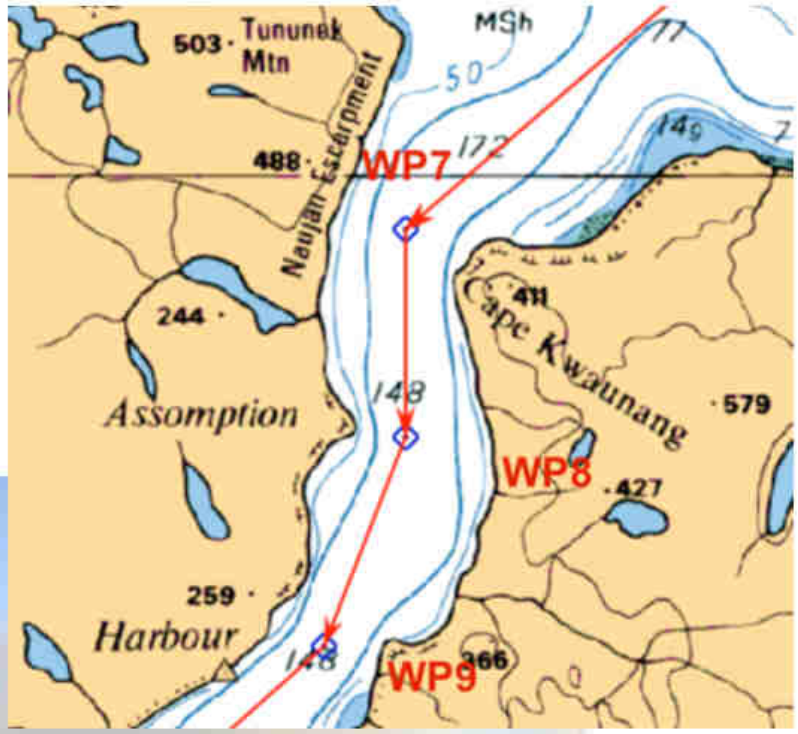
MSh
88
77
50
172
149


503 · Tununek Mtn
MSh
50
77
488 ·
WP7
172
149
Naujan Escarpment
411
244 ·
Cape Kwaunang
Assomption
148
579
WP8
427
259 ·
Harbour
148
366
WP9


Cape Kwaunang

16


Cape Kwaunang
WP7
WP8
Assomption
Cape Kwaunang
Tununek Mtn
213
472
503
488
244
411
579
174
149
MSh

17


WP7
WP8
WP9
WP10
Assomption
Harbour
Cape Kwatunang
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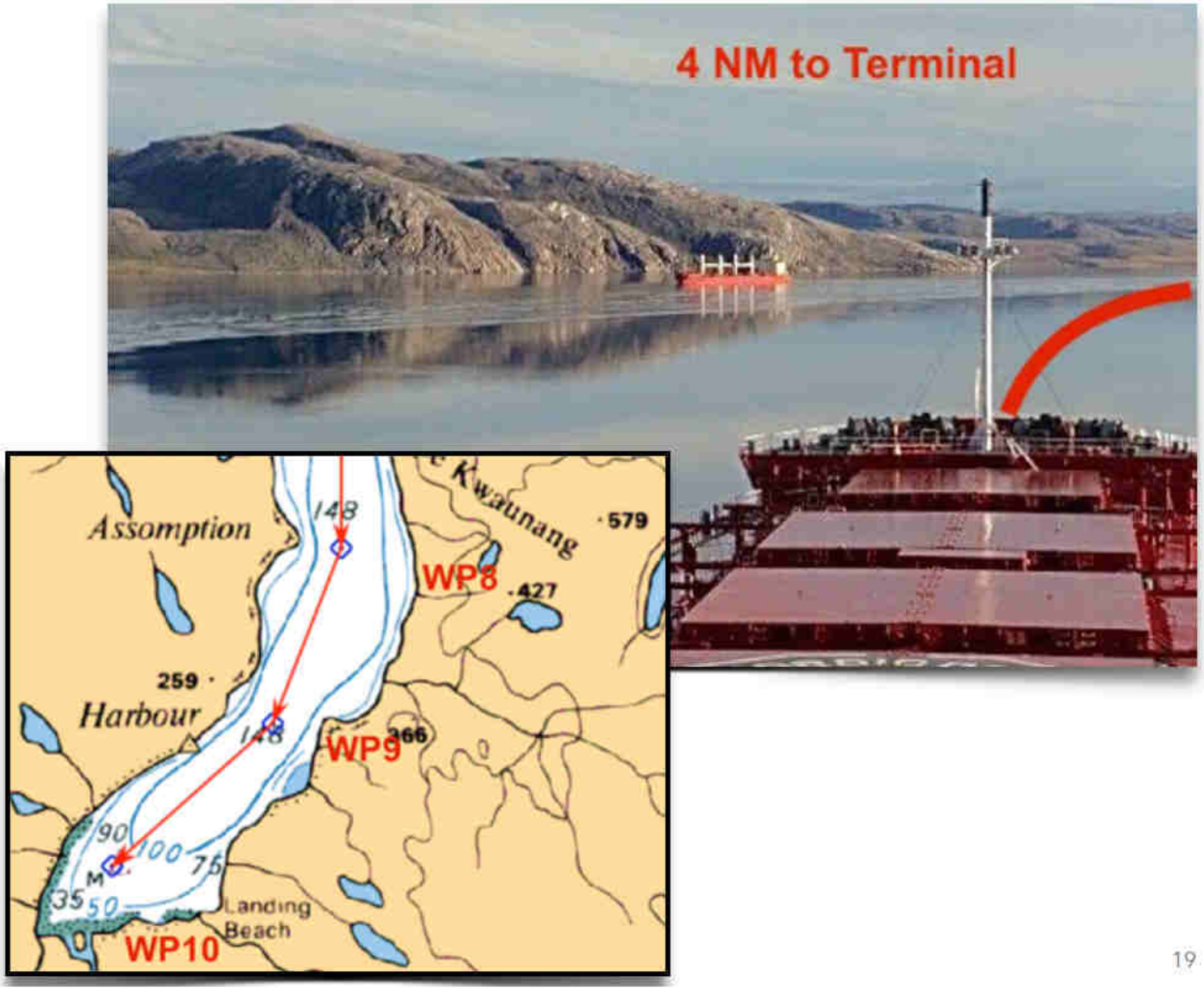
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148
Kwaunang
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Harbour
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WP9
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35
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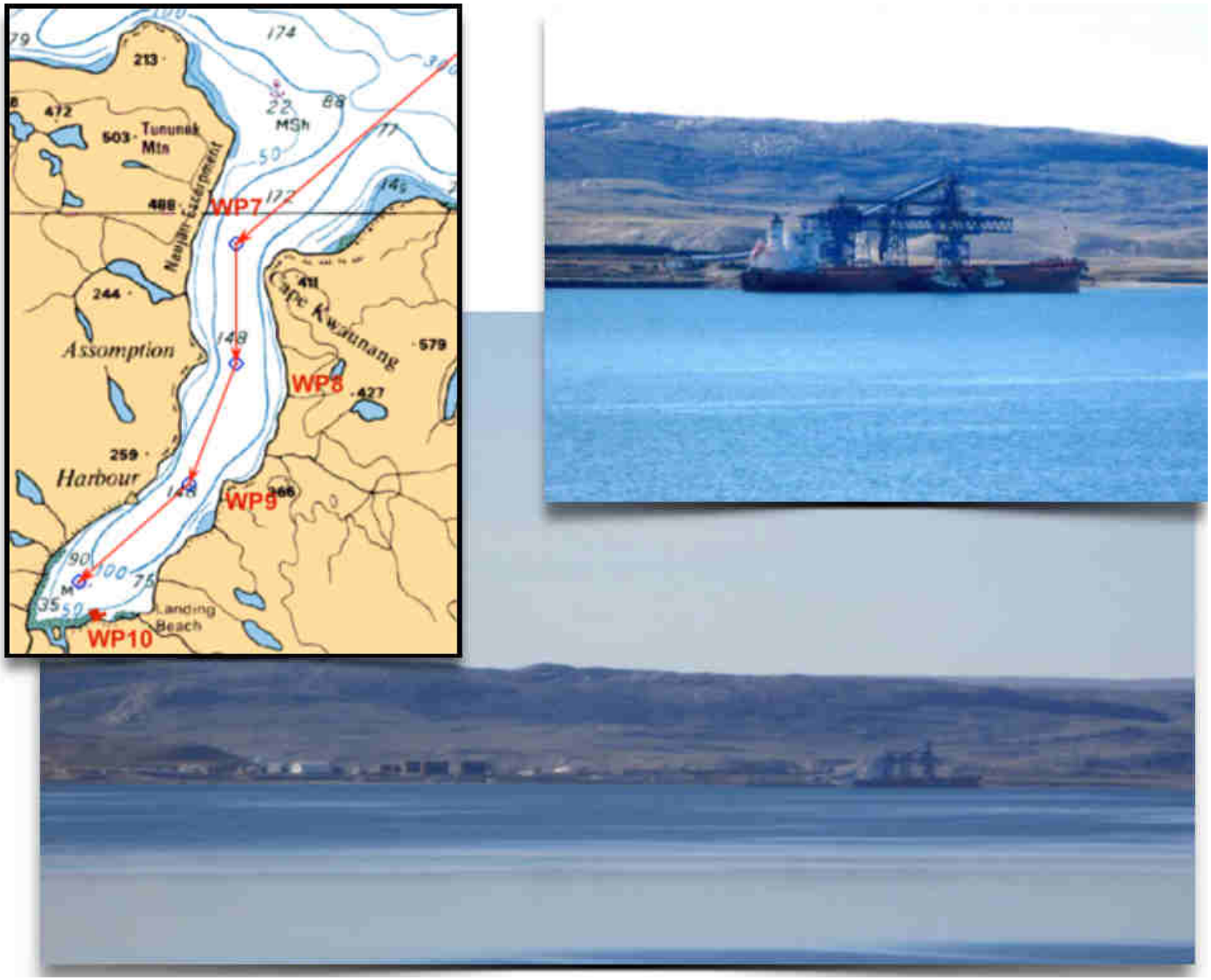
Landing
Beach
WP10
19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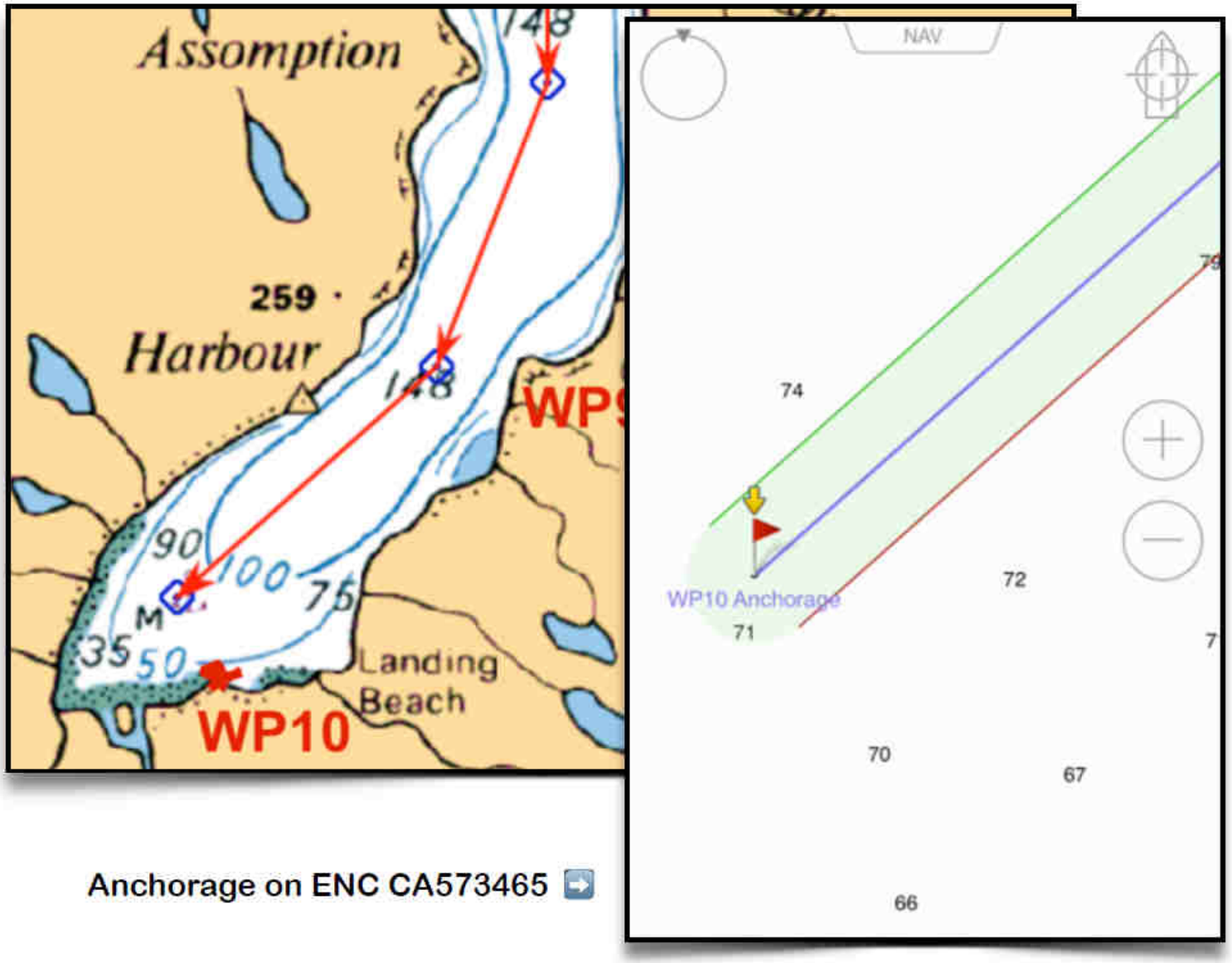
Harbour
WP9
Landing Beach
WP10



Anchorage on ENC CA573465 ➡️


Finland

Ice Navigators' Condensed Voyage Reports for Voyage to Milne Inlet 2015

Communications:

Poor communications connectivity or no connectivity can be experienced between southern Greenland and Milne Inlet, making it difficult to download ice imagery and other published weather information. Therefore it is important that owners contact their service provider to ensure they have a proper connection in these areas.

Maps/Charts:

Recommend to have onboard, the large scale Danish Charts for the west coast of Greenland, as well as all relevant and up-to-date Canadian charts.

The vessels are to have onboard all necessary and required publications and regulatory guidance to ensure compliance with Canadian Regulations.

Owners should ensure all navigation equipment is in full working order for the duration of the voyages.

Ice charts and information to be accessed include

- CIS Daily Baffin Bay
- CIS Daily Davis
- CIS Daily Approaches to Resolute
- CIS Imagery Analysis as available
- Imagery as available
- EC Surface Analysis
- EC Sea Surface Temperature
- EC Surface Winds Forecast

Equipment:

Searchlights should be readied and available for use in hours of darkness while in ice infested waters.

Good quality binoculars are required on board in order to spot sea ice at a distance.

Navigating:

The main hazard during this voyage is glacial ice. Icebergs are relatively easy to detect but bergy bits and growlers are not. These small but extremely hard pieces of ice are very difficult to detect by radar when in fog and during hours of darkness, particularly when sea conditions are moderate or worse. With sea clutter on the radar, it is hard or perhaps impossible to see these small pieces of ice. Similarly, precipitation clutter on the radar decreases the ability of the navigator to detect this dangerous ice.

Although it is inevitable that some of the vessels trading to Milne Inlet will at some point encounter growlers or bergy bits, there are ways to minimize the risk.

First, all vessels should proceed at a reduced speed in poor visibility and during the hours of darkness unless sea conditions are calm and detection of small targets is possible within 2 miles of the vessel. The detection of these small targets by radar can be assessed by observing the growlers and bergy bits near icebergs. Bergs almost always have small pieces of ice near them. If you cannot detect these by radar due to clutter, then there is a higher risk. Observing and plotting sea birds is a very good indicator of the level of radar effectiveness, as shown in Figure 8. A slower speed will also exponentially reduce impact damage should a piece of ice not be detected in time. The use of trails can help detect ice in some conditions. Figures 6 through 9 show some examples from a voyage.

Second, searchlights must be used at night in non-fog conditions. Although the visibility out to the sides will be reduced, the searchlights will illuminate small pieces of ice directly ahead of the vessel that could be missed by radar. The effective range of searchlights should be at least one mile ahead of the vessel.

Finally, a good lookout must be kept at all times both in bad visibility and good visibility. In good visibility with the vessel heading towards the sun, reflection on the water can make spotting ice impossible. If this is the case, you must alter course slightly so that the sun is not directly ahead. Good quality binoculars are required, especially for spotting sea ice at a distance. The usual radar detection range for sea ice is about 5 or 6 miles. In good visibility, you can detect sea ice at a range of well over 10 miles with good binoculars.

The portion of the voyage between the south end of Greenland and Milne Inlet is unique in a few respects. Navigation is dangerous due to sea ice and a large number of icebergs with the associated bergy bits and growlers. It is very remote and lacks ports and tugs. The small communities that dot the coastline have very little infrastructure. Communication systems on the vessels can work poorly or not at all at the high latitudes. All of these factors would present a challenge to a vessel experiencing damage, mechanical breakdown, personnel issues like sickness or injury, or other problems. The highest likelihood of damage is collision with glacial ice. Despite all precautions, it is possible for glacial ice to go undetected and come into contact with one of the vessels involved in this operation.

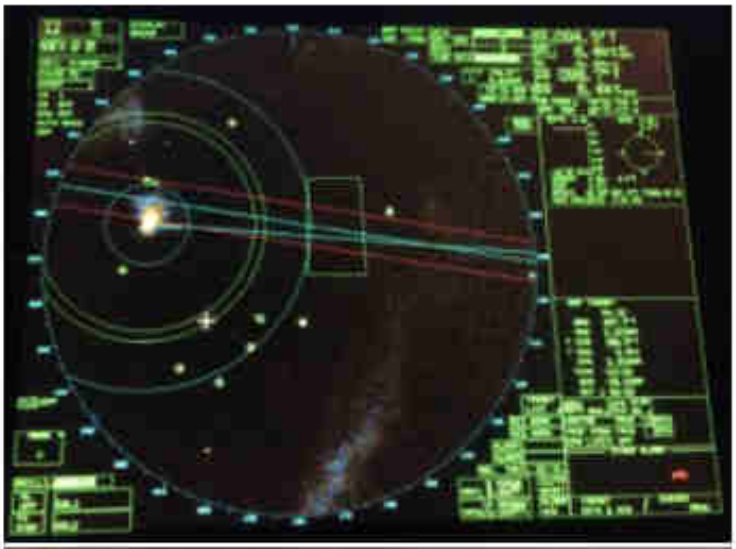


Fig. 6: All targets are icebergs, bergy bits or growlers. Note the use of guard zones, and range rings at 2 and 8 miles. Small pieces of ice need to be picked up between 2 and 8 miles before getting into sea clutter. Note precipitation SE of the vessel. The use of trails in precipitation is not effective because trails from the precipitation mask trails from other targets.

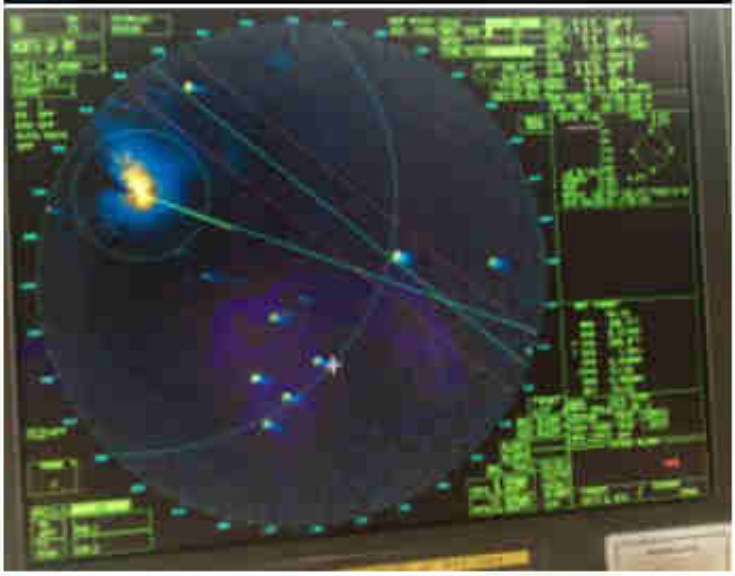


Fig. 7: Note the trails on all targets. Some of the small targets can only be noted by the presence of trails. Trails are set to Relative Motion 3:00 minutes.

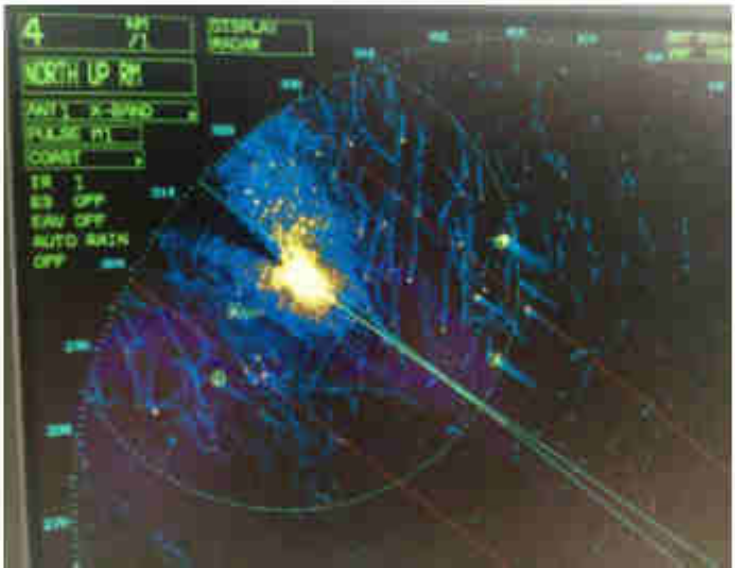


Fig. 8: Trails set to Relative Motion 3:00 minutes. Note the small targets within the 2 mile range showing movement that is not parallel to the vessel. These targets are birds.

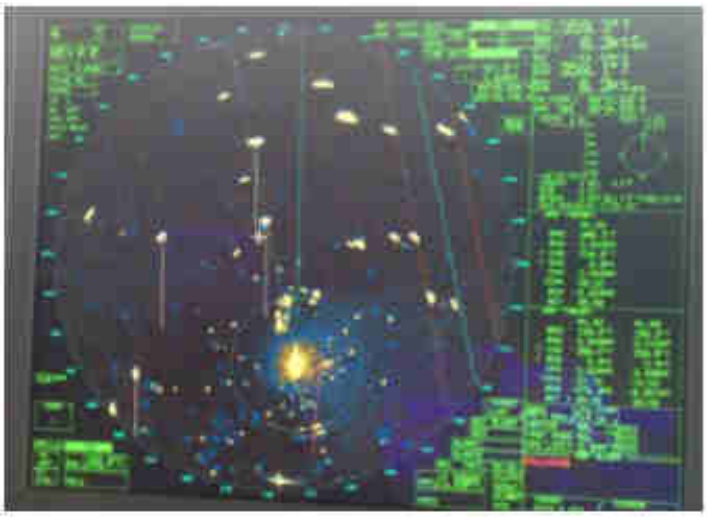


Fig. 8: Although the 10 cm band is good for precipitation, poorer discrimination than 3 cm radar makes it harder to distinguish between the sea ice on the port bow and the glacial ice. Notice also the numerous sea birds as obvious by the trails.

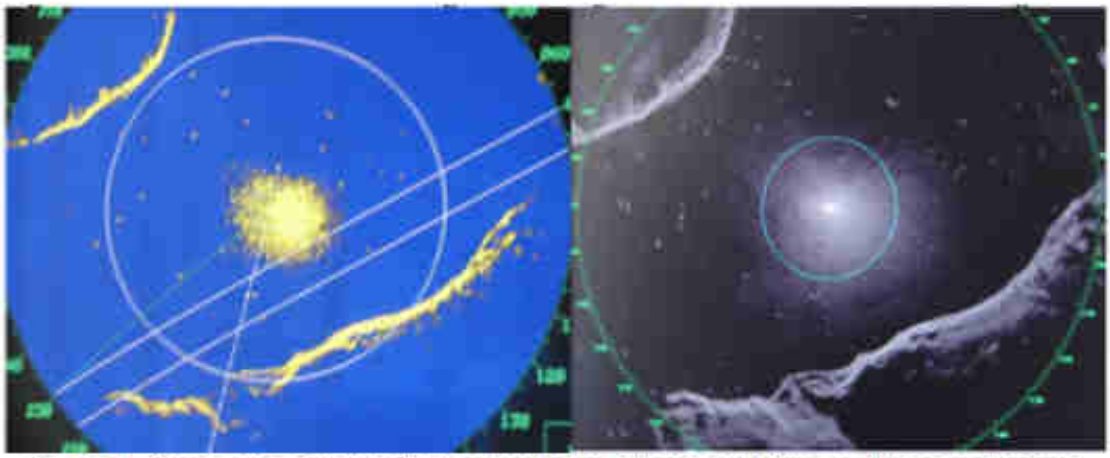


Fig. 10: Left - Standard marine 3cm radar; Right - enhanced radar. Enhanced radar shows bergy bits and growlers much better than standard radar. (Source: CCG - Ice Navigation in Canadian Waters)

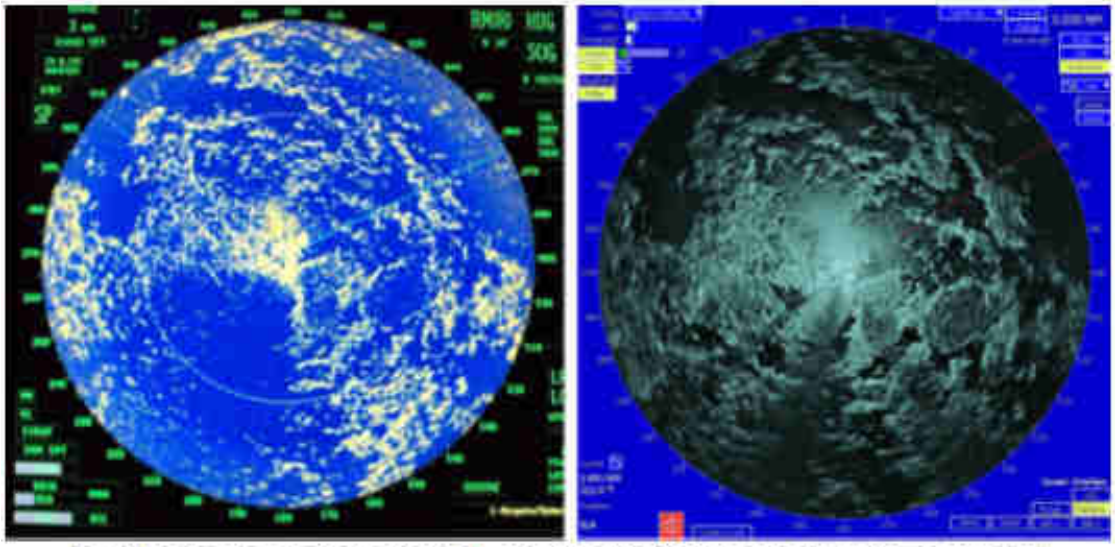


Fig. 11: Left - Standard marine 3cm radar; Right - enhanced radar. Enhanced radar shows ice much more clearly. (Source: CCG - Ice Navigation in Canadian Waters)

A Few Navigational Notes - Inbound to Milne Inlet

(John F. Cowan. June 2013)

Note: The comments and observations contained in this brief report are based upon my own experience in transiting much of the area over a number of years and also my observations taken during the visit of Federal Hunter to Milne Inlet in September 2008. These notes are not comprehensive and are provided only to present some aspects of navigating to and from Milne Inlet through Pond Inlet and Eclipse Sound.

==========

The last area to clear of pack ice enroute to Milne Inlet is typically Eclipse Sound where the winter ice forms as shorefast ice. Although some pack ice remnants can still be found out in Baffin Bay well into August, that ice is more usually small localised areas of old ice and it tends to lie offshore and to the south eastward of the entrance to Pond Inlet/Eclipse Sound.

Although pack ice may not be present enroute, there will always be icebergs, and these are to be found in higher numbers as a vessel closes with the coast of Baffin and Bylot Islands. The vast majority of these icebergs are calved from the extensive glaciers of Greenland's Melville Bay with significant numbers also drifting south through Nares Strait between Greenland and Ellesmere Island. The counter-clockwise current running across the top of Baffin Bay carries these bergs southward and across the eastern approaches to Pond Inlet.

From my own experience, it is best to approach almost directly from the eastward from a point about 50 to 60 miles off the entrance to Pond Inlet. The larger number of south-drifting bergs and their associated bergy bits and growlers lie closer inshore with only a few beyond 50 miles. Similarly, I have in the past preferred to leave Pond Inlet and head east for 50 to 60 miles before altering to the SSE. There is a temptation to alter to the south at less distance offshore, but not only does this keep the ship in more likely iceberg concentrations, but it may also result in the ship transiting numbers of grounded bergs in the area north of and adjacent to Cape Christian south of the entrance to Pond Inlet. That area of relatively shallow water extends about 30-50 miles offshore from Baffin Island.

Berg at Entrance to Pond Inlet

Few icebergs if any, will enter Pond Inlet from Baffin Bay due to a general outflow of current from Pond Inlet and Eclipse Sound. However, some bergs enter Lancaster Sound from Baffin Bay and some of these are carried towards the south shore and into Navy Board Inlet which separates western Bylot Island from Baffin Island. These are the bergs which are seen in Eclipse Sound and occasionally down into Milne Inlet. From my personal experience these intrusions down Navy Board Inlet appear to be limited to smaller bergs and this no doubt is at least partly due to larger bergs grounding and breaking in the relatively shallow water and shoals at the northern entrance to Navy Board Inlet.

When a vessel is approaching the entrance to Pond Inlet/Eclipse Sound from the eastwards, iceberg frequency will generally increase as the coast is approached. Care should be taken, and particularly so in the vicinity of the entrance due to an increased likelihood of the presence of growlers and bergy bits in addition to icebergs. An area of relatively shallow water extends eastwards from the Bylot Island southeast coast just to the north of Cape Graham Moore. Noticeable numbers of bergs ground in that area, and they inevitably calve bergy bits and growlers. Winds and currents most often will take these smaller pieces of glacial ice southwards and across the entrance to Pond Inlet.

Grounded Bergs off Cape Graham Moore, Bylot Island

In summary, the bergs found within Eclipse Sound and Pond Inlet predominately are small in size and not of great numbers. However, in addition to the icebergs, there are always some bergy bits and growlers. Because of their smaller size and extremely low freeboard, growlers are often difficult to detect in even moderate sea conditions. Typical bergs can be seen in some of the photos included in this report, and it will be noted that during m.v. Federal Hunter's visit in 2008, one very small berg came to within about a mile from the ship whilst she was anchored and loading cargo. The prevailing winds are from a northerly direction, and it will be this effect rather than currents which carry these smaller bergs into the narrow stretches of the inlet.

The eastern approaches to Pond Inlet are free of navigational hazards (other than ice), as is the transit through Pond Inlet and Eclipse Sound. The Baffin Island coast to the east of the hamlet of Pond Inlet is high and often precipitous with deep water very close inshore. At, and westwards of the hamlet, the south shore becomes generally lower and more rolling, bur rising to higher elevations inland.

Baffin Island Coast (About 15 miles east of Pond Inlet Hamlet)

On the north side is Bylot Island it is mountainous, rugged and steep-to with a number of receding glaciers.

South Eastern Coast of Bylot Island, Pond Inlet

Wide glacial valley in southwestern part of Bylot Island, Eclipse Sound

Elevations fall off further towards the western end of Bylot Island, with more rounded mountains and wider glacial valleys.

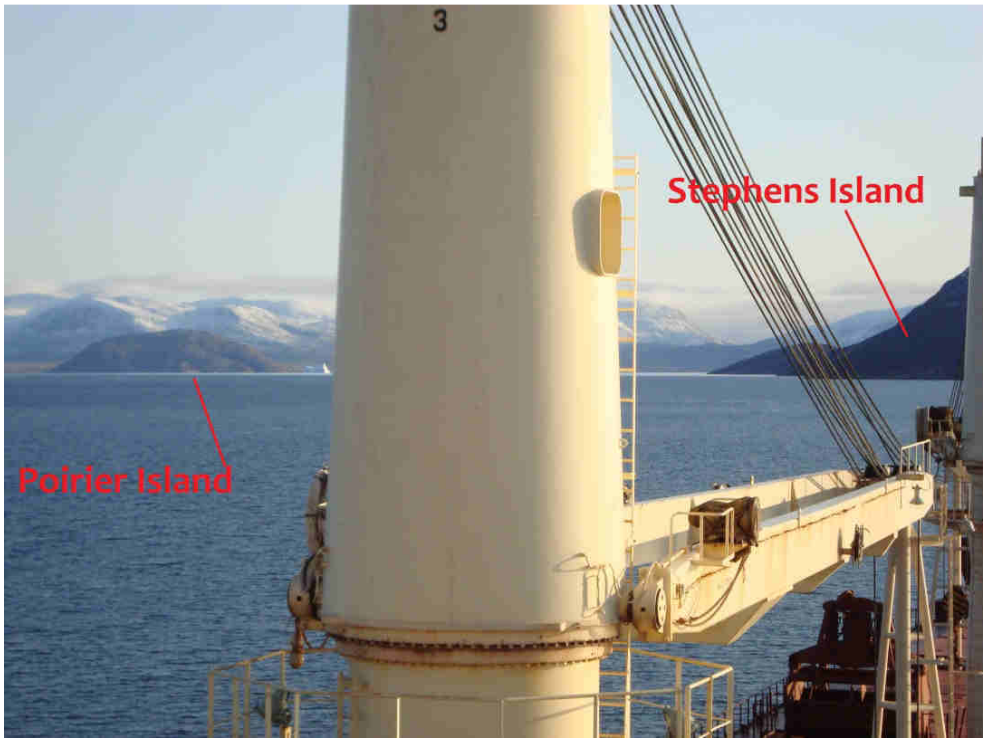
When approaching the southwestern corner of Eclipse Sound and therefore the entrance to Milne Inlet, a vessel will begin to encounter potential navigational hazards. The entrance lies between Athole Point on the western side and Ragged Island on the eastern side at about 6.5 miles distant. A rock shoal with about one metre of water over it lies about four miles NNE of the northern end of Ragged Island, and great care must be taken to give this a wide berth. An inbound vessel will approach from the northeast keeping the aforementioned shoal well clear to port, passing between it and a small island five miles to the northwest. Athole Point which is high, precipitous and conspicuous will be fine on the starboard bow.

Athole Point

Once the ship has altered course between Athole Point and Ragged Island, Milne Inlet lies ahead. There is a 22 mile run down to the south during which the inlet is typically about 8 miles wide. This area is free of any known navigational hazards and with very deep water throughout its length.

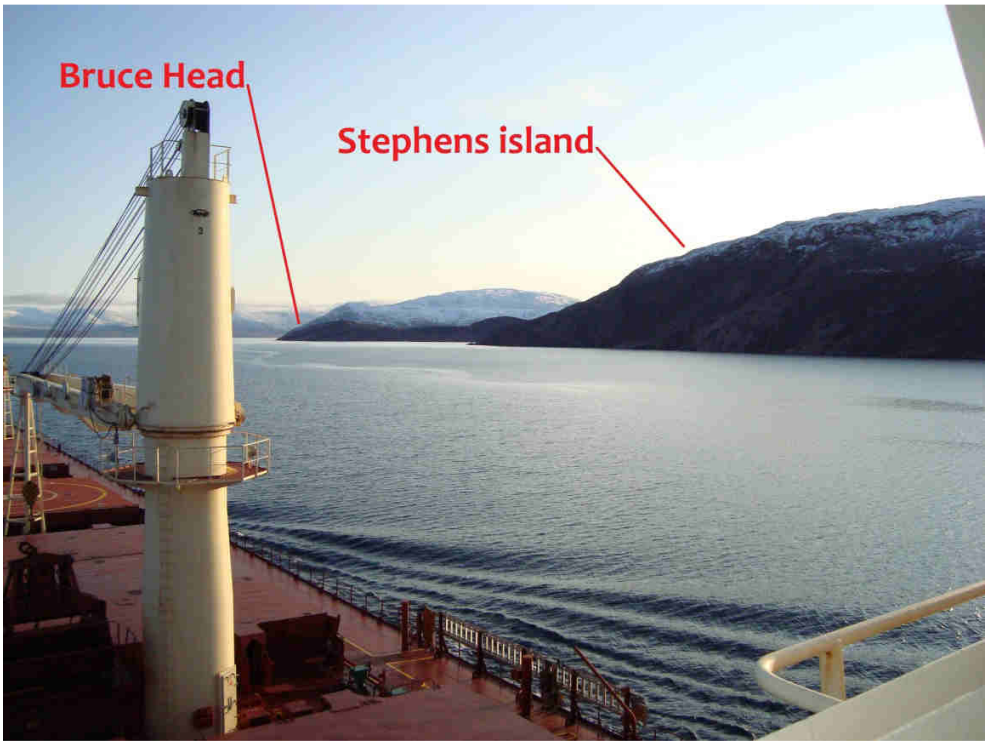
At the southern part of this main body of Milne Inlet, the inlet then turns in a SSE'ly direction. Stephens Island lies almost midway between the two shores at this point with a channel of about 1.5 miles width on its east side between it and the Ipitalik Peninsula. There is a somewhat greater width of water on the west side of the island, but the presence of a two metre shoal on that side makes the eastern side of the island more attractive.

About 3 miles to the north of Stephens Island there is Low Island (28 metre elevation). Lone Shoal with a depth of water over it of 1.8 metres lies 1.2 miles to the WNW of Ipitalik Peninsula and should be given a wide berth. The eastern channel is free of obstructions with deep water close to both of its shores.



Alteration point to pass east of Stephens Island (some zoom)


Stephens Island ahead at alteration point to clear Lone Shoal to port
(Note: Both photos were taken at similar times)



Passing down east side of Stephens Island

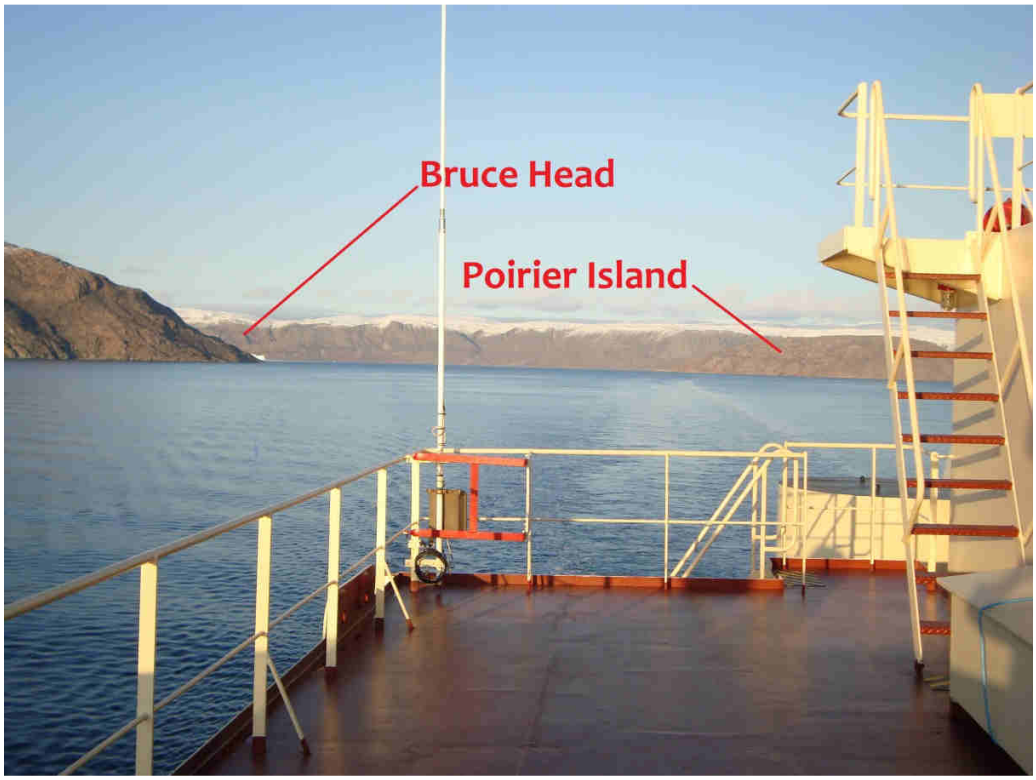
Passing down east side of Stephens Island
(Note: Both photos were taken at similar times).

Poirier Island which is a prominent dome-shaped island (243 metre elevation) lies about 3.75 miles SSE from Stephens Island. When passing east of Stephens Island, Poirier Island will lie almost ahead.

Once clear of, and to the south of Stephens Island, a ship will then alter to starboard to pass between Poirier Island and Bruce Head which lies two miles to the westward. At this point the ship is about 14 miles from the loading anchorage area.

Poirier Island from the northwest

From Poirier Island/Bruce Head, a WSW'ly course for about seven miles leads to the narrow and final seven miles down into the anchorage at the bottom of Milne Inlet. This final portion of the inlet is entered between the very prominent Cape Kwaunang to port and the steep-sided Naujan Escarpment to starboard. At this point the distance between the two shores is approximately 1.3 miles, and this width is fairly typical for the remaining few miles down to the anchorage.



Cape Kwaunang

The water depth throughout the final seven miles of narrow inlet to the anchorage is in excess of 100 metres. When about 1.5 miles from the bottom of the inlet the bottom rises above the 100 metre contour with the 50 metre contour being very close to shore. Consequently the anchorage area lies in quite deep water, even although the vessel may only be a half mile offshore. The bottom is mud and therefore a reasonable holding ground, but due to depth a ship should lay out a good length of anchor cable. M.V. Federal Hunter used nine shackles. Prevailing winds are northerly.

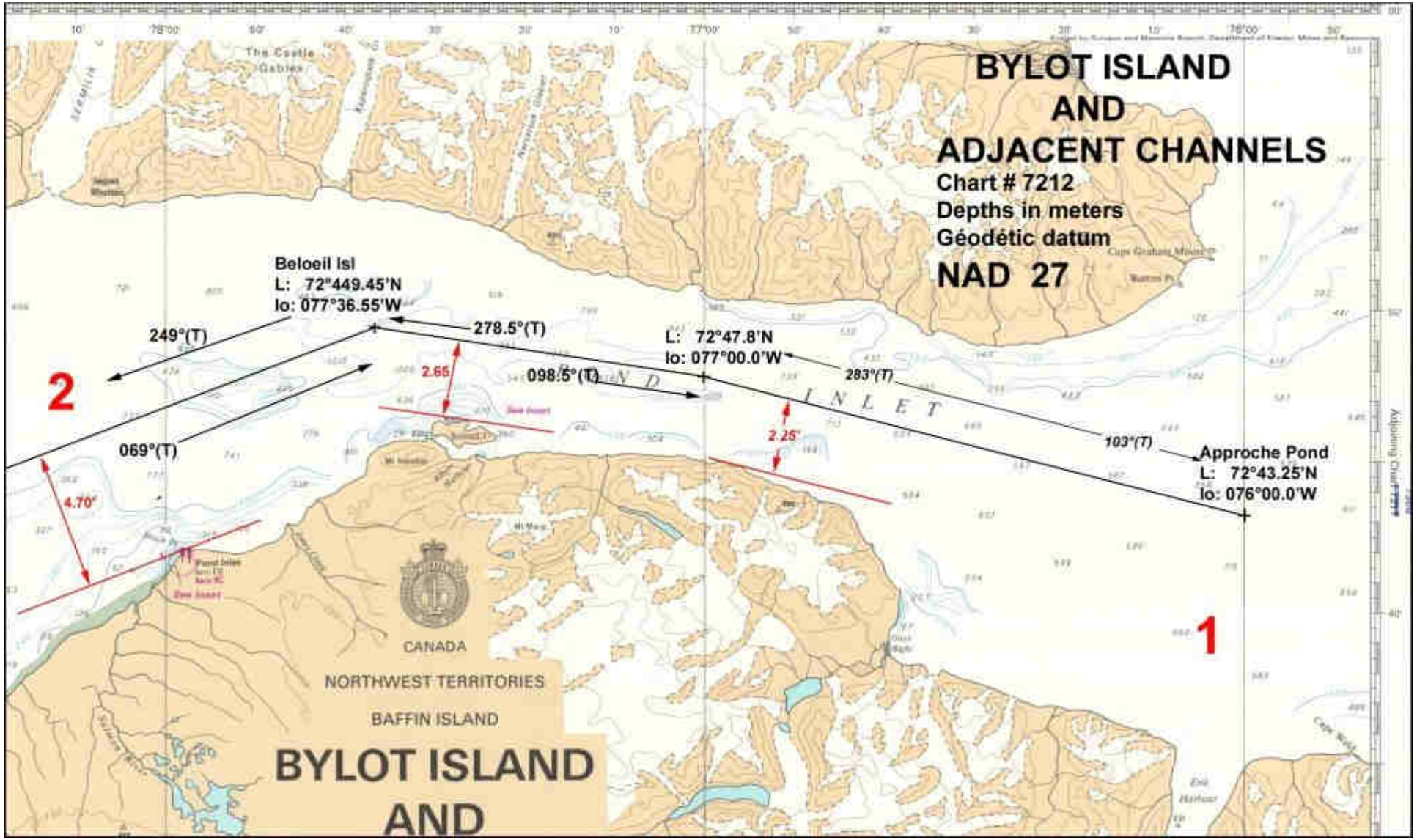
Loading at the anchorage with m.v. Federal Maas in the distance

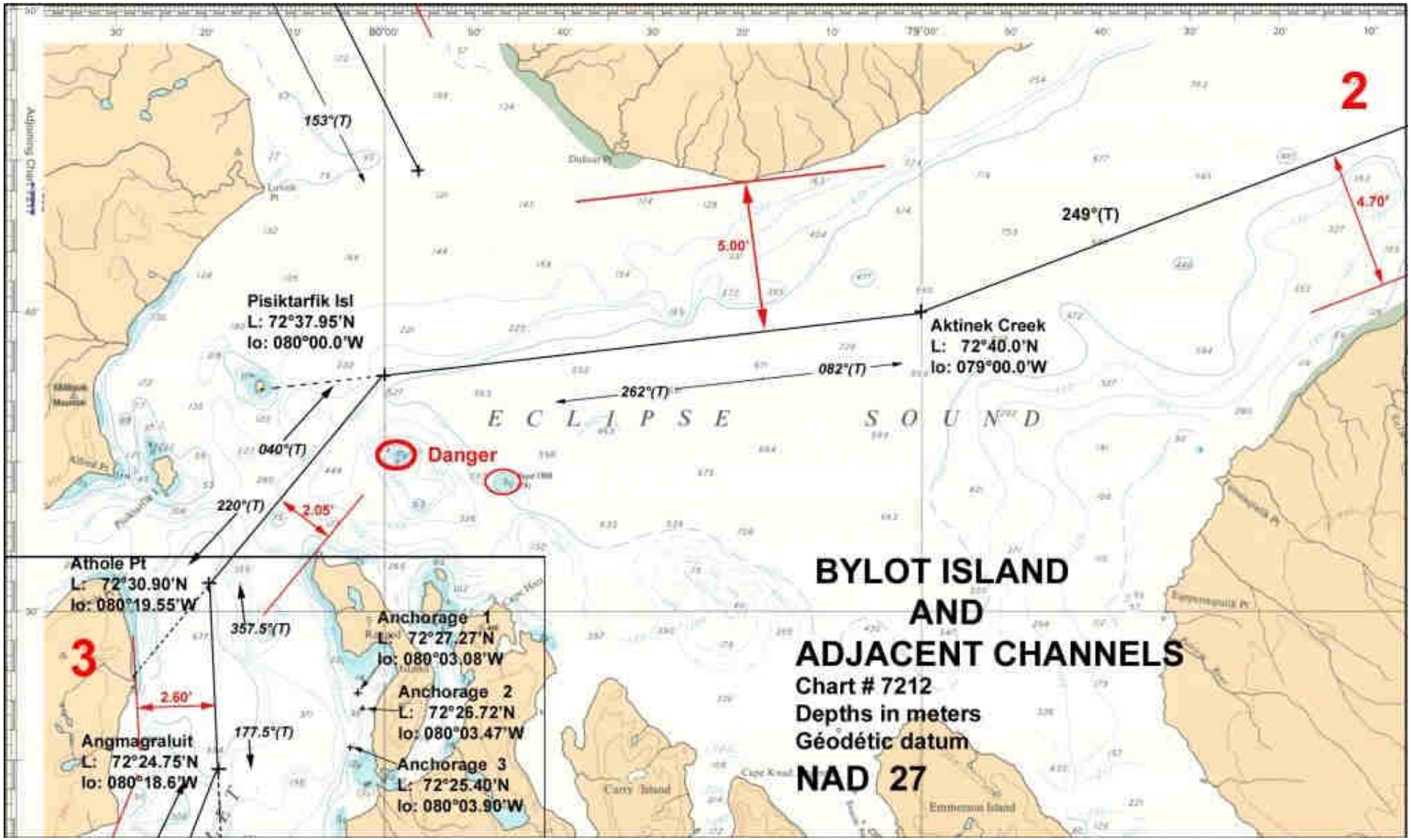
During m.v. Federal Hunter's stay at the anchorage, a near-gale struck up from the north. The ship held well but a small wind-driven berg came down the inlet from the north. It had the potential to require avoiding action, but the berg was intercepted and pushed clear of the drift line by the Ocean tug that was in attendance. However, it served to alert us to the fact that a watch must be kept for bergs and appropriate action be taken to avoid them contacting an anchored ship and/or the cargo barges moored alongside.

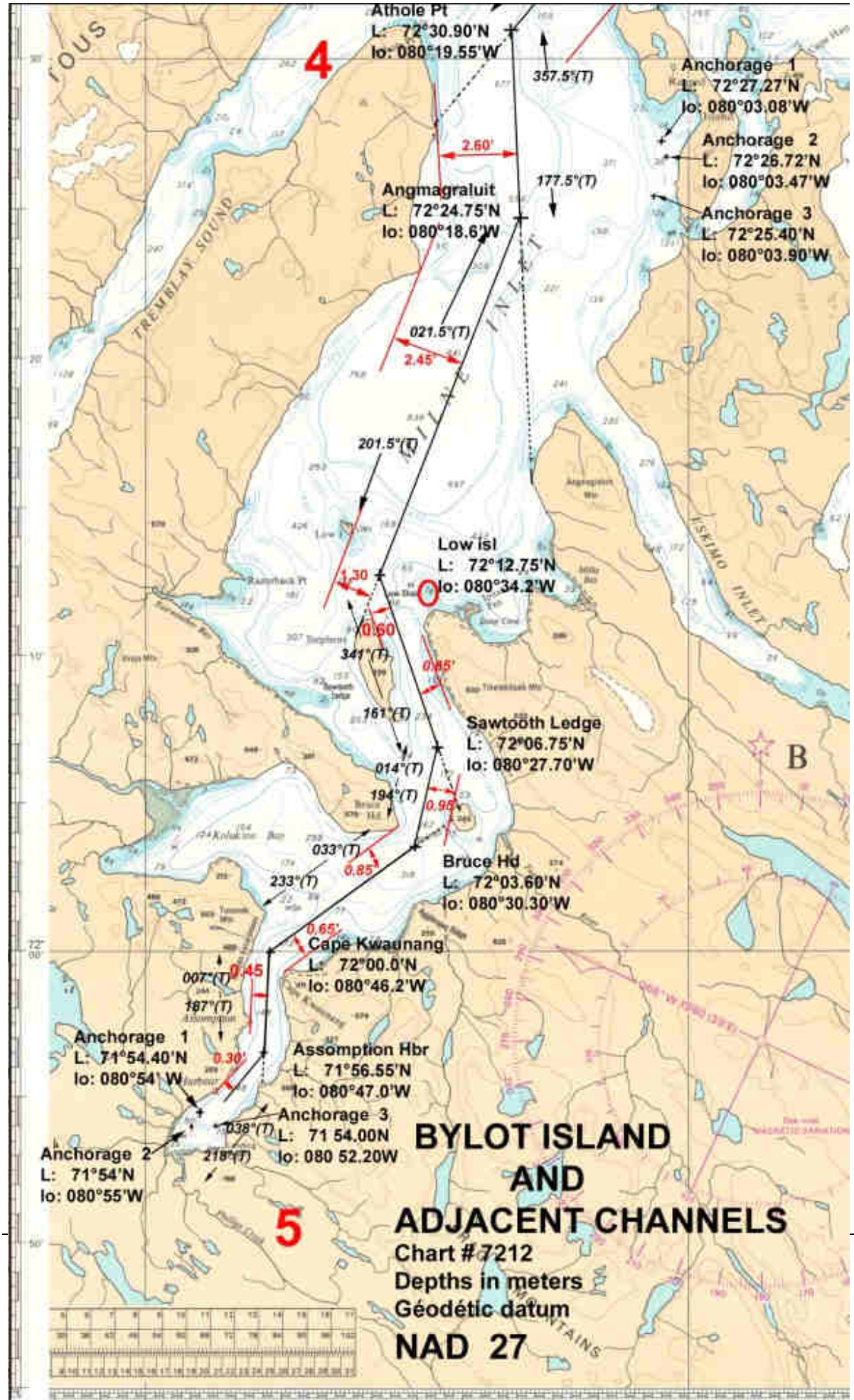
Iron Ore barge being placed alongside


Tug pushing small berg clear

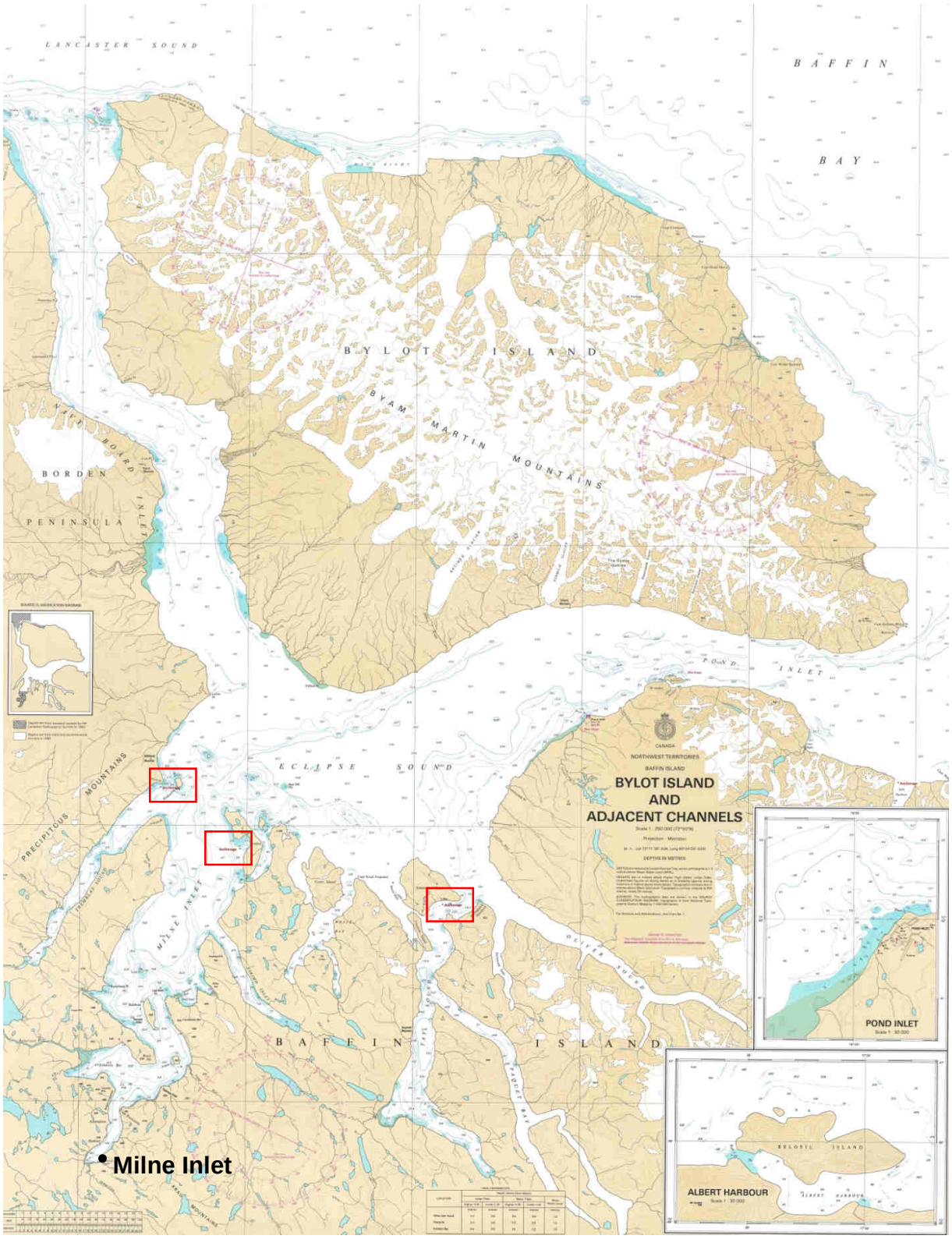
Map of Suggested Route to Milne Inlet

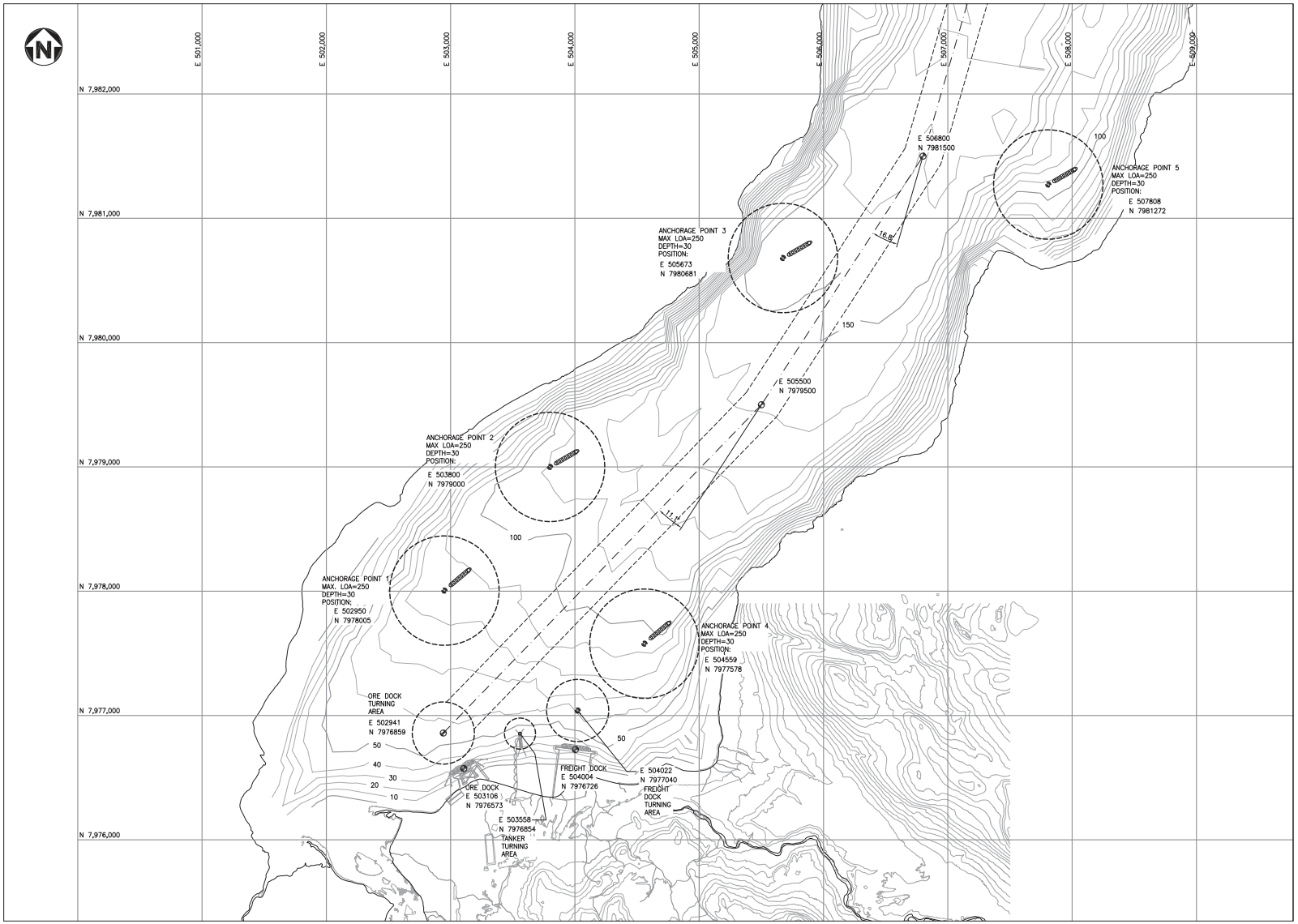

BYLOT ISLAND
AND
ADJACENT CHANNELS
Chart # 7212
Depths in meters
Géodétic datum
NAD 27
Beloeil Isl
L: 72°449.45'N
lo: 077°36.55'W
249°(T)
278.5°(T)
L: 72°47.8'N
lo: 077°00.0'W
283°(T)
098.5°(T)
069°(T)
2.65
2.25
4.70'
103°(T)
Approche Pond
L: 72°43.25'N
lo: 076°00.0'W
2
1
CANADA
NORTHWEST TERRITORIES
BAFFIN ISLAND
BYLOT ISLAND
AND

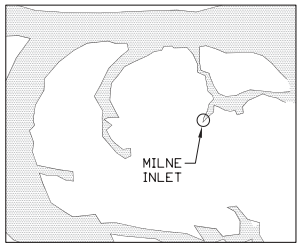

2
153°(T)
249°(T)
5.00'
4.70'
Pisiktarfik Isl
L: 72°37.95'N
lo: 080°00.0'W
Aktinek Creek
L: 72°40.0'N
lo: 079°00.0'W
082°(T)
262°(T)
E C L I P S E S O U N D
040°(T)
Danger
220°(T)
2.05'
Athole Pt
L: 72°30.90'N
lo: 080°19.55'W
357.5°(T)
3
2.60'
177.5°(T)
Angmagraluit
L: 72°24.75'N
lo: 080°18.6'W
Anchorage 1
L: 72°27.27'N
lo: 080°03.08'W
Anchorage 2
L: 72°26.72'N
lo: 080°03.47'W
Anchorage 3
L: 72°25.40'N
lo: 080°03.90'W
BYLOT ISLAND
AND
ADJACENT CHANNELS
Chart # 7212
Depths in meters
Géodétic datum
NAD 27


Athole Pt
L: 72°30.90'N
lo: 080°19.55'W
4
357.5°(T)
Anchorage 1
L: 72°27.27'N
lo: 080°03.08'W
Anchorage 2
L: 72°26.72'N
lo: 080°03.47'W
Anchorage 3
L: 72°25.40'N
lo: 080°03.90'W
2.60'
Angmagraluit
L: 72°24.75'N
lo: 080°18.6'W
177.5°(T)
TREMBLAY SOUND
BYLOT INLET
021.5°(T)
2.45'
201.5°(T)
Low isl
L: 72°12.75'N
lo: 080°34.2'W
1.30'
0.60'
341°(T)
0.65'
161°(T)
ESKIMO INLET
Sawtooth Ledge
L: 72°06.75'N
lo: 080°27.70'W
B
014°(T)
194°(T)
0.95'
033°(T)
0.85'
Bruce Hd
L: 72°03.60'N
lo: 080°30.30'W
233°(T)
0.65'
Cape Kwaunang
L: 72°00.0'N
lo: 080°46.2'W
007°(T)
0.45'
187°(T)
Anchorage 1
L: 71°54.40'N
lo: 080°54'W
0.30'
Assomption Hbr
L: 71°56.55'N
lo: 080°47.0'W
Anchorage 3
038°(T)
L: 71 54.00N
lo: 080 52.20W
Anchorage 2
L: 71°54'N
lo: 080°55'W
218°(T)
5
BYLOT ISLAND
AND
ADJACENT CHANNELS
Chart # 7212
Depths in meters
Géodétic datum
NAD 27

Anchorage Locations







KEYPLAN

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

MILNE INLET NAVIGATION PLAN

Baffinland

REF NO. BL_Vol3_PDF_001

FIGURE 3-2.12

REV 0

APPENDIX 5 – DOCUMENTS AND CERTIFICATES

Mate's Receipt

Baffinland
Iron Mines Corporation

SHIPPER
Baffinland Iron Mines Corporation
Suite 300, 2275 Upper Middle Road East,
Oakville, ON Canada L6H 0C3
Tel: +1 (416) 364-8820
Fax: +1 (416) 364-0193
www.baffinland.com

MATE'S RECEIPT

DATE of SAILING:	
VESSEL:	M/V
PORT of REGISTRY:	
NAME of MASTER:	
OWNERS:	
CONSIGNEE:	
PORT of LOADING:	
PORT of DISCHARGE:	
CARGO LOADED (*Description*):	
STOWAGE (*Holds Loaded by No.*):	
TOTAL LOADED (*Ship's Figures*):	Metric Tonnes

QUALITY & QUANTITY UNKNOWN

Notify:	Master / Chief Officer *Signature and stamp here:*

Statement of facts

FEDNAV

Statement of Facts

M/V Port: Berth:	C/P Date Between Baffinland and:
EOSP: Anchored: Reason for anchoring: POB: Anchor up: Berthed A/F:	Holds passed: NOR tendered: NOR received: Tugs IN Tugs OUT # of cranes used Ships Shore
Purpose of call: Commenced: Completed: Draft survey completed: Equipment off: Lashing completed: Cargo docs on board: Date & time of sailing: Vessel sailed for:	Bunkers on arrival: MT IFO MT MDO Bunkers received: MT IFO MT MDO Bunkers on departure: MT IFO MT MDO Fresh water on arrival: Fresh water received: Fresh water on departure:
Cargo: B/L Weight: Outturn weight:	Draft on arrival: F M A Draft on departure: F M A Density: 1,000
Stowage for this cargo only	

Date	Day	Hours worked		Hours stopped		Holds worked	Quantity	Remarks
		From	To	From	To			

General Remarks FOR TIME WORKED ONLY SUBJECT TO ALL TERMS AND CONDITIONS AS PER CHARTER PARTY DATED:	
Place & Date	Name & Signature (Agents)
Name & Signature (Master)	Name & Signature (For the Charterers/Shippers/Receivers)

Date	Day	Hours worked		Hours stopped		Holds worked	Quantity	Remarks
		From	To	From	To			

General Remarks

FOR TIME WORKED ONLY SUBJECT TO ALL TERMS AND CONDITIONS AS PER CHARTER PARTY DATED:

Place & Date	Name & Signature (Agents)
Name & Signature (Master)	Name & Signature (For the Charterers/Shippers/Receivers)

Date	Day	Hours worked		Hours stopped		Holds worked	Quantity	Remarks
		From	To	From	To			

General Remarks

FOR TIME WORKED ONLY SUBJECT TO ALL TERMS AND CONDITIONS AS PER CHARTER PARTY DATED:

Place & Date	Name & Signature (Agents)
Name & Signature (Master)	Name & Signature (For the Charterers/Shippers/Receivers)

Letter of Authorization

RE: AUTHORISATION TO SIGN BILLS OF LADING

VOYAGE CHARTER PARTY

M/V _____ Voyage _____

Loading _____

Under Charter Party dated _____at _____

I, _____, master of the above mentioned vessel, hereby authorize the said FEDNAV Limited and /or any representatives appointed by the company, to sign Bills of Lading and/or Consular Documents on my behalf with respect to cargo which may be received for shipment and/or shipped by this vessel under the voyage charter party or booking note dated _____ at _____.

Bills of Lading signed by you on my behalf are not to be issued or released without the express written permission of Fednav Limited. The form and contents of the Bill(s) of Lading must be approved in advance by Fednav Limited.

Yours truly,

Master _____

M/V _____

Dated _____

Transportable Moisture Limit & Moisture Content

Baffinland

MATERIAL SAFETY DATA SHEET
IRON ORE

Product Name: **IRON ORE (BAFFINLAND IRON MINES CORPORATION)**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name: BAFFINLAND IRON MINES CORPORATION
Address: Suite 300, 2275 Upper Middle Road East, Oakville, Canada, L6H 0C3
Telephone: + (1) 416 364 8820
Fax: + (1) 416 364 0193
Synonyms: BAFFINLAND MARY RIVER IRON ORE
MARY RIVER LUMP ORE (LUMP: grain size - less than 31.5mm greater than 6.3mm)
MARY RIVER FINE IRON ORE (FINES: grain size - less than 6.3mm)
Uses: STEEL PRODUCTION.

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO NOHSC CRITERIA
NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Formula	Raw Ore.	CAS No.
SILICA, CRYSTALLINE - QUARTZ	SiO2	~1.3-2.8%	14808-60-7
PHOSPHORUS (P)	P	~0.03%	7723-14-0
SULPHUR (AS PYRITE)	S	~0.1%	7704-34-9
IRON ORE (% AS IRON)	Fe	65-69%	Not Available
WATER	H2O	1%	7732-18-5
ALUMINIUM OXIDE	Al2O3	1.2%	1318-23-6
ADDITIVES		None	Not Available

4. FIRST AID MEASURES

Eye Contact: Flush gently with running water. Will result in no special effects other than mechanical irritation due to abrasion. Seek medical attention if irritation develops.

Inhalation: Dust may cause mechanical irritation to the respiratory tract. If over exposure occurs, leave exposure area immediately. Seek medical attention if symptoms develop.

Skin Contact: Not a general concern, If irritation develops, gently flush affected areas with water.
Ingestion: Not a normal route of exposure. For advice, contact a doctor. If swallowed, do not induce vomiting.

Advice To Doctor: Treat symptomatically.

Special Toxic Effects: Prolonged and repeated inhalation of iron dust may result in siderosis or iron pigmentation. Siderosis is considered a benign condition and does not appear to progress to fibrosis. Development of siderosis takes 6 to 10 years of prolonged extensive exposure to iron ore dust. Coarse grained nature of Mary River iron ore would generally only required inhalation protection around crusher or in mine areas immediately after blasting.

5. FIRE FIGHTING MEASURES

Flammability: Non-flammable. May evolve toxic gases/ fumes (iron oxides) when heated to decomposition. Heating to decomposition requires temperatures in excess of 1,500° C.

Solubility: Insoluble and inert in water or acid.

Fire: Non-flammable. Evacuate area and contact emergency services.

Explosion: Material does not support combustion even if heated to decomposition. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use water-fog to cool intact containers and nearby storage areas.

Extinguishing: Non-flammable.

Hazchem Code: None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage: Collect and reuse where possible.

7. HANDLING AND STORAGE

Handling: Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

Storage: No special requirements for the storage of this product.

Baffinland
MATERIAL SAFETY DATA SHEET
IRON ORE

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation: Use with adequate natural ventilation. Where a dust inhalation hazard exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

Exposure Standards: SILICA, CRYSTALLINE - QUARTZ (14808-60-7)
ES-TWA : 0.1 mg/m3 (Silica Quartz, respirable, NOHSC)
ES-TWA# : 0.1 mg/m3 (QLD); 0.15 mg/m3 (NSW) WES-TWA : 0.2 mg/m3
PHOSPHORUS (P) (7723-14-0)
ES-TWA : 0.1 mg/m3 Phosphorus (yellow)
WES-TWA : 0.1 mg/m3

PPE: Wear dust-proof goggles and gloves appropriate for job conditions. When using large quantities or where heavy contamination is likely, wear coveralls. At high dust levels, wear a Class P1 (Particulate) or NIOSH dust Respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: REDDISH/BROWN TO BLACK LUMPS

Odour: EARTHY ODOUR **pH**: NOT AVAILABLE **Vapour Pressure**: NOT AVAILABLE

Vapour Density: NOT AVAILABLE **Boiling Point**: NOT AVAILABLE

Melting Point: NOT AVAILABLE **Evaporation Rate**: NOT AVAILABLE **Solubility (water)**: INSOLUBLE

Specific Gravity: ~5 g/cc^3 for ore **Bulk Density:** 2.4-2.9 g/cc^3 for crushed ore piles

% Volatiles: NOT APPLICABLE

Flammability: NON FLAMMABLE

Flash Point: NOT RELEVANT **Boiling Point:** N/A **Melting Point**: greater than 1500°C

Upper Explosion Limit: NOT RELEVANT

Lower Explosion Limit: NOT RELEVANT **Auto ignition Temperature**: NOT AVAILABLE

10. STABILITY AND REACTIVITY

Reactivity: Incompatible with strong acids (e.g. hydrochloric acid).

Decomposition: May evolve toxic gases/ fumes (iron oxides) when heated to decomposition. May also evolve silicon oxides when Products heated to decomposition.

Baffinland
MATERIAL SAFETY DATA SHEET
IRON ORE

11. TOXICOLOGICAL INFORMATION

Health Hazard: Low irritant. Use safe work practices to avoid eye or skin contact and dust inhalation.

Summary: Sized particles may cause iron ore to reside in the lungs, resulting in a benign pneumoconiosis (siderosis) which does not appear to affect respiratory function. Due to product form and particle size, adverse health effects are greatly reduced as an inhalation hazard is not anticipated. Due to the product form and particle size of this product, adverse health effects are considered unlikely.

Eye: Low irritant. Exposure to dust/ powder may result in mechanical irritation.

Inhalation: Low irritant. Over exposure to respirable sized particles at high levels may result in mucous membrane irritation of the nose and throat. Chronic over exposure may cause a benign lung pneumoconiosis known as siderosis. Iron ore particles may remain in the lung when inhaled, however respiratory function is not normally affected.

Skin: Low irritant. Prolonged and repeated contact may result in irritation due to mechanical action.

Ingestion: Low toxicity. Ingestion of large quantities may result in gastrointestinal irritation, nausea and vomiting. However, due to product form, ingestion is considered unlikely.

Toxicity Data: SILICA, CRYSTALLINE - QUARTZ (14808-60-7)

Carcinogenicity of Silica: Classified as a human carcinogen (IARC Group 1)

PHOSPHORUS (P) (7723-14-0)

LD50 (Ingestion) : 3030 ug/kg (rat)

12. ECOLOGICAL INFORMATION

Environment: The main component/s of this product occurs naturally in the earth's crust. It is not anticipated to cause any adverse effects to plants or animals.

13. DISPOSAL CONSIDERATIONS

Waste: Re-use where possible. No special precautions are required for this product.

Disposal Legislation: Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

Transport: Not classified as a Dangerous Good according to the Act and Regulations for the Transport of Dangerous Goods by Road and Rail.

UN Number: None Allocated

DG Class: None Allocated

Subsidiary: None Allocated

Risk(s) Packing Group: None Allocated

Hazchem Code: None Allocated

15. REGULATORY INFORMATION

AICS: All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

REACH: Natural (iron ore) ores are except from registration under REACH (Registration, Evaluation and Authorisation of Chemical) Regulation (L 136/98 Annex V)

Test for respirable crystalline silica (RCS) completed in fine iron ore is <0.0014%. Test completed as per Size Weighted potential Respirable Fraction ("SWeRF") analytical method as per REACH requirements.

MARPOL Annex V: Iron Ore (iron oxide) is high insoluble and hence non-hazardous. Leach tests have shown that the metals in iron ore are not bio-available and thus non-hazardous. Work is in progress with regulatory authorities to develop an Environmental Quality Standard (EQS) and Ecotoxicity Reference Value (ERV) for iron. Efforts are also underway for the non-classification of iron ore under Annex V.

Poison: A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Schedule Scheduling of Drugs and Poisons (SUSDP).

16. OTHER INFORMATION

Additional Information

Respirators: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

Exposure Standards -Time Weighted Average (TWA) or WES (Workplace Exposure Standards): Exposure standards are established on the premise of a 12 hour work period of normal intensity, under normal climatic conditions and where a 12 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

Personal Protective Equipment Guidelines: Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Health Effects from Exposure: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations:

mg/m3 - Milligrams per cubic metre
ppm - Parts Per Million
TWA/ES - Time Weighted Average or Exposure Standard.
CNS - Central Nervous System
NOS - Not Otherwise Specified
pH -relates to hydrogen ion concentration -this value will relate to a scale of 0 -14, where 0 is highly acidic and 14 is highly alkaline.
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
M - moles per litre, a unit of concentration.
IARC - International Agency for Research on Cancer.

Report Reviewed and Printed 2016 July 04

Draft Survey Form

Baffinland
Iron Mines Corporation

DRAFT SURVEY REPORT

Client / Principal
Name of Vessel: 0
Port / Place
Description of Cargo
Deadweight

Arrival :
Light Ship :
Summer Draft :

		Initial Survey	Final Survey
	Date of Reading :		
	Time of Reading :		
	Hogging (-) / Sagging (+)	#VALUE!	#VALUE!
	Sea Condition :		
1. Forward Draft	Port Side		
	Starboard Side		
	Mean	#VALUE!	#VALUE!
	Correction	#VALUE!	#VALUE!
	Corrected	#VALUE!	#VALUE!
2. Afterward Draft	Port Side		
	Starboard Side		
	Mean	#VALUE!	#VALUE!
	Correction	#VALUE!	#VALUE!
	Corrected	#VALUE!	#VALUE!
3. Fwd and Aftward Mean Draft		#VALUE!	#VALUE!
4. Mid Ship Draft	Port Side		
	Starboard Side		
	Mean	#VALUE!	#VALUE!
	Correction	#VALUE!	#VALUE!
	Corrected	#VALUE!	#VALUE!
5. Mean of Mean	M/M	#VALUE!	#VALUE!
6. Quarter Mean	M/M/M	#VALUE!	#VALUE!
	Keel Thickness Corr.		
Quarter Mean Correct'd to Keel Thickness	M / M / M	#VALUE!	#VALUE!
7. Displacement		#VALUE!	

8. Trim Correction	Initial	Final			
Trim	#VALUE!	#VALUE!			
TPC	#VALUE!		1st	#VALUE!	#VALUE!
LCF	#VALUE!	#VALUE!	2nd	#VALUE!	#VALUE!
MTC	#VALUE!	#VALUE!			
LBP					
Density					

9. Displacement Corrected for Trim	#VALUE!	#VALUE!
10. Density Correction	#VALUE!	#VALUE!
11. Displacement Corrected for Density	#VALUE!	#VALUE!
12. Total Deductible Weight	0.000 mt	0.000 mt

Ballast		
Fresh Water		
Fuel Oil		
Diesel Oil		
Lub. Oil		
Others		

13. Net Displacement	#VALUE!	#VALUE!
14. Total Cargo Loading	#VALUE!	

Remarks:

Acknowledge,

Chief Officer

Surveyors

Baffinland
Iron Mines Corporation

BALLAST & FRESH WATER TANK

Vessel : 0

Port :

Initial Survey

Survey Date :

Time :

BALLAST WATER				
TANK	Sounding	Volume (Cu.M)	Density (kg/m3)	Weight (MT)
TOTAL		-		-

FRESH WATER				
TOTAL		-		-

Draft	Fore	#VALUE!	Meter
	Aft	#VALUE!	Meter
	Trim	#VALUE!	Meter

Final Survey

Survey Date :

Time :

BALLAST WATER				
TANK	Sounding	Volume (Cu.M)	Density (kg/m3)	Weight (MT)
TOTAL		-		-

FRESH WATER				
TOTAL		-		-

Draft	Fore	#VALUE!	Meter
	Aft	#VALUE!	Meter
	Trim	#VALUE!	Meter

SURVEYOR

CHIEF OFFICER

Baffinland
Iron Mines Corporation

CERTIFICATE OF WEIGHT

Date of issued :

This is to certify, that the undersigned Marine and Cargo Surveyors did at request of principal Messrs.:

for the purpose of executing a Draft Survey has attended on hereunder vessel:

Name of Vessel	0	
Port of Registry	:	
Gross Register Tonnage		
Deadweight Tonnage		

Based on the scale and hydrostatic tables provided onboard, computation of the total cargo weight being loaded/discharged from the vessel was accomplished and reported as follows:

Description of Cargo	:	
Quantity as per B/L - Manifest		
Port / Place	:	
Attending Date Initial & Final	&	

The calculation is ascertained as follows:

Corrected Displacement on Initial Survey	:	#VALUE!
Corrected Displacement on Final Survey	:	#VALUE!
Gross Total Cargo Loading	:	#VALUE!

Surveyor

Master / Chief Officer

Baffinland
Iron Mines Corporation

FUEL & DIESEL OIL TANK

Vessel _____

Port _____

MFO - INITIAL

Date : Time :

Tank	Sounding/ Ullage (M)	Volume Cu.M	Density @ 15°C	Temp (C)	Metric Tons
TOTAL		0.000			0.000

MFO - FINAL

Date : Time :

Tank	Sounding/ Ullage (M)	Volume Cu.M	Density @ 15°C	Temp (C)	Metric Tons
TOTAL		0.000			0.000

MDO - INITIAL

Tank	Sounding/ Ullage (M)	Volume Cu.M	Density @ 15°C	Temp (C)	Metric Tons
TOTAL		0.000			0.000

Draft Fore #VALUE! Meter

Aft #VALUE! Meter

Trim #VALUE! Meter

MDO - FINAL

Tank	Sounding/ Ullage (M)	Volume Cu.M	Density @ 15°C	Temp (C)	Metric Tons
TOTAL		0.000			0.000

Draft Fore #VALUE! Meter

Aft #VALUE! Meter

Trim #VALUE! Meter

_____ MASTER

_____ CHIEF ENGINEER

_____ SURVEYOR

Certificate of Origin

<table>
<tr><td colspan="3">Certificate of Origin / Certificat d'origine</td></tr>
<tr><td>Exporter- Exportateur

Baffinland Iron Mines Corporation
300-2275 Upper Middle Street East
Oakville, Ontario Canada
L6H 0C3
Tel: + (1) 416 364 8820
Fax: + (1) 416 364 0193</td><td colspan="2">Consignee – Destinataire

ArcelorMittal Bremen GmbH
Carl-Benz Strasse 30
D-28237 Bremen

c/ Port of Bremen, Germany</td></tr>
<tr><td>Numbers – Numéros</td><td colspan="2">Particulars of Transport (where required)
Renseignements relatifs au transport (le cas échéant)</td></tr>
<tr><td>MARKS & NUMBERS; NUMBER & KIND OF PACKAGES; DESCRIPTION OF THE GOODS / MARQUES ET NUMÉROS; NOMBRE ET NATURE DES COLIS; DÉSIGNATION DES MARCHANDISES</td><td>QUANTITY
QUANTITÉ</td><td>GROSS WEIGHT
POIDS BRUT</td></tr>
<tr><td>Mary River DSP (lump iron ore)
(direct shipped iron ore crushed and screened to greater than 6.3 mm and less than 28.0 mm in size)

Iron (Dry) analysis at 67% Fe (iron) basis, with exact weight and analysis to be based upon draft survey and analysis at Discharge Port</td><td></td><td>_____ tonnes</td></tr>
<tr><td>Name of Authorized Notary</td><td colspan="2">Sworn to me this _____day of _____.
Juré devant moi ce _____jour de _____.

Signature_____</td></tr>
</table>

The undersigned has examined the Manufacturer`s invoice or Shipper`s Affidavit concerning the origin of the merchandise, and according to the best of his/her knowledge and belief finds that the products named originated in the country specified. Le sousigné a vérifié l'origine des marchandises d'après la facture du fabricant ou la déclaration sous serment de l'expéditeur et, à sa connaissance et à son avis, pense que les produits énumérés ci-dessus sont originaires du pays spécifié. _____ Authorized Signature / Fondé de signature	It is hereby certified that the above mentioned goods originate in: Le soussigné certifie que les marchandises mentionnées ci-dessus sont originaires de: Mary River, Nunavut, Canada Country / Pays Milne Inlet, Nunavut, Canada day of 2017 Place and Date / Lieu et Date _____ Authorized Signature / Fondé de signature

Safe Loading Report

Baffinland
Iron Mines Corporation

Safe Loading Report

M/V _____

Date (yyyy/mm/dd): _____

Port: Milne Port, Nunavut

I, herewith, certify that during loading of the M/V _____

NO DAMAGE was reported or the reported damage was repaired to my satisfaction.

Furthermore, I herewith certify that the ship has been loaded in accordance with the agreed loading plan, with the holds loaded to the Master's requirements.

Signature of Master or Ship's Representative:

_____

Name: _____

Title: _____

Date (yyyy/mm/dd): _____

Port: Milne Port, Nunavut

SHIPPER'S DECLARATION

FORM FOR CARGO INFORMATION for Solid Bulk Cargoes

Note: This form meets the requirements of SOLAS 1974, Chapter VI, Reg 2 (for cargo carried in solid bulk) and the IMSBC Code, Section 4.2

General Information

Shipper	Transport document number
Consignee	Carrier
Name/means of Transport	Instructions or other matters
Port/Place of departure	
Port/place of destination	

Cargo Information

General description of the cargo (For solid bulk cargo – type of material/partcle size)	
Gross mass (kg/tonnes) General cargo: Cargo unit(s): Bulk cargo:	Relevant special properties of the cargo (eg highly soluble in water. For solid bulk cargo, see Section 4 of the IMSBC Code)

Solid Bulk Cargo Information

BCSN	
Specification of bulk cargo (if applicable) Stowage factor: Angle of repose: Trimming procedures: If potential hazard – chamical properties*: *eg: Class, UN number or MHB	Group of the cargo ☐ Group A and B* ☐ Group A* ☐ Group B ☐ Group C ** For cargoes which may liquefy (Group A and Group A and B cargoes)*
Classification relating to MARPOL Annex V ☐ Harmful to marine environment ☐ Not harmuful to marine environment HME information is for the master to consider in relation to how cargo residues Generated by this cargo may be handled and disposed of after discharge of the cargo.	Transportable moisture limit Moisture content at shipment
☐ Additional certificate(s) if required	

☐ Certificate of moisture content ☐ Certificate of transportable moisture limit* ☐ Weathering certificate ☐ Exemption certificate Approval certifcate for the procedures for sampling, testing and controlling the moisture Content for a solid bulk cargo that may liquefy *(see 4.4.3 of the IMSBC Code)* Other (specifiy): *May be combined into a single certificate

Declaration

I hereby declare that the consignment is fully and accurately described and that the given test results and other specifications are correct to the best of my knowledge and belief and can be considered as representative for the cargo to be loaded.		
Name/status, company/organisation of signatory	Place and date	Signature on behalf of shipper
Shipper's may deliver this declaration by fax or other electronic means. In any electronic transmission, where the signature of the declarer cannot be transmitted, full name of the declarant in capital letters must be provided on the form.		

Ship / Shore Safety Checklist per BLU Code

Baffinland

Ship/Shore Safety Checklist for Loading
At Milne Inlet Terminal

Date: _____ Ship's Name: _____

Arrival Draft: _____ Departure Draft: _____

The Master and Terminal Representative should complete this checklist jointly. The safety of operations requires that all questions should be answered affirmatively and the boxes ticked. If this is not possible, the reason should be given, and agreement reached upon precautions to be taken between ship and terminal. If a question is considered to be not applicable write "N/A", explaining why if appropriate.

1. **Is the depth of water at the berth adequate for the cargo operations to be completed?**

   Ship ☐ Terminal ☐

2. **Are mooring arrangements adequate for all local effects of tide, current, weather, traffic and craft alongside?**

   Ship ☐ Terminal ☐

3. **In emergency, is the ship able to leave berth at any time?**

   Ship ☐ Terminal ☐

4. **Is the agreed ship/terminal communication system operative?**
   a. **Communication method:** _____
   b. **Language:** _____
   c. **Radio channels/phone numbers: Primary: 5A (frequency 156.250000); Back-up: 7A (frequency: 156.350000)**

   Ship ☐ Terminal ☐

5. **Are the liaison contact persons during operations positively identified?**
   a. **Ship contact persons:** _____
   b. **Shore contact persons:** _____
   c. **Location:** _____

   Ship ☐ Terminal ☐

6. **Are adequate crew on board and available, and are terminal adequately staffed for emergencies?**

   Ship ☐ Terminal ☐

7. **Have any intended repairs to wharf or ship whilst alongside been advised and agreed?**

   Ship ☐ Terminal ☐

8. **Has a procedure for reporting and recording damage from cargo operations been agreed?**

   Ship ☐ Terminal ☐

9. **Has the ship been provided with copies of port and terminal regulations, Standing Instructions to Master; including safety and pollution requirements and details of emergency services?**

   Ship ☐ Terminal ☐

10. **Has the shipper provided the Master with the properties of the cargo in accordance with the requirements of chapter VI of SOLAS?**

    Ship ☐ Terminal ☐

11. **Is the atmosphere safe in holds and enclosed spaces to which access may be required and has the need for monitoring of atmosphere been agreed by ship and terminal?**

    Ship ☐ Terminal ☐

12. **Have the cargo capacity and any limits of travel for each loader been passed to the ship?**

    Ship ☐ Terminal ☐

13. **Has a cargo loading plan been calculated for all stages of loading/deballasting?**
    a. **Copy lodged with:** _____

    Ship ☐ Terminal ☐

14. **Have holds to be worked been clearly identified in the loading plan, showing the sequence of work, and the grade and tonnage of cargo to be transferred each time a hold is worked?**

    Ship ☐ Terminal ☐

15. **Do both ship and terminal understand and accept that if the ballast programme becomes out of step with the cargo operation, it will be necessary to suspend cargo operation until the ballast operation has caught up?**

    Ship ☐ Terminal ☐

16. **Have the procedures to adjust final trim of the loading ship been decided and agreed?**

    Ship ☐ Terminal ☐

17. **Has the terminal been advised of the time required for the ship to prepare for sea, on completion of cargo work?**

    Ship ☐ Terminal ☐

18. **Have the cargo holds been inspected and deemed to be clean, free of debris and ready for loading?**

    Ship ☐ Terminal ☐

19. **Has the ballast water exchange testing been completed and accepted?**
    a. **Hold Tested:** _____
    b. **Tested Value:** _____

    Ship ☐ Terminal ☐

20. **Acknowledgement that engines are not to be immobilized.**

    ☐

21. **Acknowledgement that hot work is not to be permitted.**

    ☐

22. **Authority to sign Bill of Lading issued to Terminal Representative.**

    ☐

The above has been agreed:

Time:_____**Date:**_____

For Ship: _____ **For Terminal:**_____

Rank: _____**Position/Title:**_____

Safety Letter

SAFETY LETTER

Company: Baffinland Iron Mines Corporation
Terminal: Milne Port Iron Ore Terminal
Date (yyyy/mm/dd): _____

The Master: MV _____
Port: Milne Port, Nunavut

Dear Sir,

Responsibility for the safe conduct of operations while your ship is at this terminal rests jointly with you, as Master of the ship, and with the responsible Terminal Representative. We wish, therefore, before operations start, to seek your full co-operation and understanding on the safety requirements set out in the Ship/Shore Safety Check-List, which are based on safe practices that are widely accepted by iron ore loading terminals and bulk carrier operators and mandated by the BLU Code.

We expect you, and all under your command, to adhere strictly to these requirements throughout your ship's stay alongside this terminal and we, for our part, will ensure that our personnel do likewise, and co-operate fully with you in the mutual interest of safe and efficient operations.

Before the start of operations, and from time to time thereafter, for our mutual safety, a member of the terminal staff, where appropriate together with a Responsible Officer, will make a routine inspection of your ship to ensure that elements addressed within the scope of the Ship/Shore Safety Check-List are being managed in an acceptable manner. Where corrective action is needed, we will not agree to operations commencing or, should they have been started, we will require them to be stopped.

Similarly, if you consider that safety is being endangered by any action on the part of our staff or by any equipment under our control, you should demand immediate cessation of operations.

There can be no compromise with safety.

Please acknowledge receipt of this letter by countersigning and returning the attached copy.

Signed Terminal Representative: _____

Terminal Representative on duty is: _____

Position or Title: _____

Contact Details: _____

Signed Master SS/MV _____ Signature_____

Date(yyyy/mm/dd) / Time _____

Pre-Arrival Information Per BLU Code

Baffinland

PRE-ARRIVAL INFORMATION

Milne Port Terminal to the Master

Note: *This pre-arrival information is provided by the Terminal to the Master in accordance with the provisions of the BLU and ISPS Code.*

Date Issued:		Ship Name:	M/V				
Name of Berth:	Milne Port Terminal	Side Alongside:	Starboard		Port		
Estimated Berthing Date:		Estimated Cargo Tonnage to Load:				tonnes	
Estimated Berthing Time:		Estimated Completion Time:				hours	
Loading Equipment:		Number of Shiploaders:	2				
		Type of Shiploaders:	Two Tower Shiploader				
		Characteristics of Shiploaders:	Slewing & Shuttling with Elephant Trunk				
		Expected maximum load rate Shiploader No. 1:	2,250	tonnes/hr			
		Expected maximum load rate Shiploader No. 2:	2,250	tonnes/hr			
		Expected combined max. load rate Shiploaders No. 1 & 2	4,500	tonnes/hr			
		Estimated times for each stage of loading to be agreed on arrival.					
		Air Draft of Shiploaders: Lowest Low Water Large Tide	21.265	meters			
Minimum depth of water alongside at Chart Datum		17.5 meters	meters	Water Density:			
Depths in Approach and Departure Channel:		Adequate at all times for all ships.	Yes		No		
		Berthing times restricted as follows:					
Maximum allowable berthing velocity:		Per Docking Master advice once onboard.					
Docking Master Information:		Docking Masters normally board:	2.0 nautical miles north of terminal.				
		Docking Master VHF Channel	Ch.		Freq.		
Ships waiting to berth normally proceed direct:		Anchorage 1:	Lat.	72°27'27"N	Long.	80°03'08"W	
		Anchorage 2:	Lat.	72°26'72"N	Long.	80°02'47"W	
Maximum distance from waterline to top of hatch coaming:		Ships Loading:	meters				
Arrangements for gangways and access:		Terminal Personnel will board vessel at berth via pilot ladder:	Midship, Port side				
		Vessel crew not permitted ashore except for draft surveying and/or emergencies.					
Tugs:		Number Available:	2				
		Number normally required:	Per Docking Master advice once onboard.				
		Tug type:	ASD	Bollard Pull	65 tonnes		
		Tugs will supply towing lines to connect to ship.					
Line Boat Available:		Yes		No			
Draft Reading Boat Available:		Yes		No			
Main Engine Immobilization alongside:		Permitted		Not Permitted			
Grades of cargo to be loaded:		Iron Ore – Lump:	tonnes				
		Stowage Factor on loading:	t/m^3				
		Iron Ore – Fines:	tonnes				
		Stowage Factor on loading:	t/m^3				
Special Loading Operations Requirements:		Independent draft survey will be performed.					
		Random Ballast Water Salinity Test will be performed.					
		Cargo Hold Inspection will be performed.					
		Loading shall not commence until authorized by Terminal Representative.					
		Allowance to run clean shiploader conveyor belts	Max 320	tonnes			

		is:				
		Mate's Receipt to be issued by ship based on Ship's Figures.				
Loading Plan:	Loading Plan(s) should be prepared for:	2 - Shiploaders		1 - Shiploader		
Shiploader Characteristics:	Maximum outreach beyond fender line at 90°:			31.5		meters
	Minimum retraction distance beyond fender line at 90°:			13.3		meters
	Horizontal distance between C/L Shiploader Towers			80.0		meters
	Shiploader maximum slewing radius from C/L Tower			44.8		meters
	Fender line standoff distance from berth face:			4.5		meters
Mooring Arrangements:		Number of Headlines:		4		
		Number of Forward Breast Lines:		2		
		Number of Forward Springs:		2		
		Number of After Springs:		2		
		Number of After Breast Lines:		2		
		Number of Stern Lines:		4		
		Total Number of Mooring Lines:		**16**		
		Master may increase number of mooring lines as conditions warrant.				
Shifting vessel during loading:		Terminal may require vessel to shift along berth to position shiploaders over holds.				
Unusual mooring requirements:		Bow and stern mooring lines will require long leads.				
ISPS Information – Security Level Terminal:		**Level 1**		**Level 2**		**Level 3**
Name PFSO and Assistant PFSO:						
PFSO Contact Information:						
Name of Terminal Representative:						
Terminal Representative Contact Information:	Telephone:		Email:			
Signature Terminal Representative:				Date:		

APPENDIX 6 – FOR BAFFINLAND IRON MINES USE ONLY

FINANCE / COMMERCIAL – For Baffinland Use

Invoicing

Final Sale - Provisional Invoice

Upon receipt of the Bill of Lading (including Draft Survey results) from the Ships Master, and the ore quality assay from the ALS laboratory (located at Milne Inlet), the Mine Accountant shall prepare a customer invoice in keeping with specified Incoterms and other relevant provisions of the ore sales contracts.

The Commercial Manager (or in his absence the Financial Controller) shall approve such invoice prior to its release. The invoice shall include, as a minimum, the following for each ore product shipment.

- Name, address and other contact information of customer
- Payment terms all in accordance with relevant Incoterms or as otherwise specified by contract;
- Baffinland bank / remittance information
- Invoice date
- Product Type (Super Sinter Fines (SUSF) or Direct Ship Pellets (DSP))
- Weight of the shipment, as per Bill of Lading (Draft Survey)
- Product Specification, as per the Certificate of Analysis
- Benchmark market price, net of freight adjustments
- Adjustments for volume/loyalty discounts, product premiums and/or deleterious elements, all as per contract terms
- Final balance owing, adjusted for any advance payments already received from the customer

The Mine Accountant is expected to keep a log of all deliveries of ore product (tonnes and chemistry) to the stockpiles delivered to Milne Port by customer and product type (SUSF and DSP) as well as all shipments from such stockpiles, with the weight (as per the Draft Survey) and the assay results documented.

In addition to the preparation of the Provisional Invoice, the balance of original documentation will be consolidated by the Mine Accountant for delivery, on an expedited basis, to the customer. Such documents include:

1. Bill of Lading (including Draft Survey)
2. Certificate of Analysis
3. Notarised Certificate of Origin
4. Declaration by Shipper
5. Customs (Bill of Lading and Provisional Invoice)
6. Bulk Cargo - Declaration of Shipper
7. MSDS
8. Transportable Moisture Limit (fines cargo)
    a. TML – Procter Fagerburg
    b. Cargo Moisture Test

All commercial matters of an administrative nature shall be carried out with the support of the Senior Corporate Accountant.

Cargo, Charters' Legal Liability & Terminal Operator's Insurance

Cargo/Delay in Start Up/Inland Transit

The Cargo & DSU policy is placed for shipments from Valleyfield and/or World to the Milne Port to cover the physical loss or damage to cargo (machinery, equipment and supplies) required for the construction and operation of the mine site. Coverage is also afforded to items for which BIM is legally liable and/or has instructions or responsibility to insure. Previously the territorial scope of this policy was Valleyfield to the project site. This was updated to worldwide but subject as always to underwriting information.

The Consequential Loss or Delay in Start Up coverage indemnifies BIM for the Consequential Delay in Start Up as defined following loss or and/or damage to the subject matter insured in transit. There must be a recoverable direct damage loss that will trigger the Delay in Start-up consequential loss cover. A critical piece of equipment will need to have been damaged and thus requiring replacement by which the Insured will suffer consequential loss if the critical piece of equipment is not on site in a timely manner for the start-up of the operation.

Currently the Cargo policy only covers the machinery, equipment and/or supplies going to the project site. Moving forward the goal is to incept coverage for the inland transit portion from Mary River until delivery to the stockpile at Milne Inlet. Coverage will be in effect from the time the ore is loaded at Mary River until the time it is loaded on the ocean going vessel. As the terms of sale are Free On Board (FOB) our policy will bear the responsibility for the direct damage to the ore until it is onboard the vessel. Coverage will also include the stockpile of Ore at the terminal.

Charterers' Legal Liability

The Charterers' Legal Liability policy covers BIM's liability as Charterers' of a vessel from Valleyfield to Milne Inlet. These vessels are used for the transport of equipment and re-supply during the open water shipping season. This coverage is based around the Charter Party agreements BIM signs with counterparties such as Nunavut Sealink and Supply Inc. and Svitzer.

BIM's Charterers' Legal Liability policy covers the charterers' legal and contractual liability exposures resulting from damage to the vessel or third party liability where the charterer is at fault (safe berth, loading, unloading, stowage of cargo, and bodily injury).

This policy includes the following extensions.

(a) Demurrage resulting from any accident in which the said vessel(s) is involved.
(b) Protection and indemnity
(c) Sudden and Accidental Pollution Liability

The following are some of the key exclusions under the Charterer's Liability Policy:

(a) all loss or damage to cargo (covered by the aforementioned cargo policy)
(b) all liability to crew and employees of BIM (would be considered first parties)

Terminal Operators' Policy

The Terminal Operators' Legal Liability Policy covers third party liabilities and BIM as operator of the Terminal. This policy includes cover for the safe berth of vessels and any stevedoring activity for property damage during the loading and unloading of vessels at port and the storage of cargo if required.

Coverage is usually provided on the following basis:

a) Physical loss of or damage to vessels and/or craft including loss of use thereof (provided such loss of use shall have arisen as a direct result of physical damage of such vessel or craft), their equipment, cargo, freight, and all other interests (including the cost of or expense of the removal of wreck of such property) the property of others while docking, undocking and whilst at the landing and mooring facility of BIM or whilst otherwise in the BIM's custody or possession as a terminal owner or operator.

b) Any other physical loss of or damage to property (including cargo) of others, arising out of the BIM's operations at terminal locations, including the loading and/or unloading and/or handling and/or storage of cargo.

c) Loss of life, bodily injury or sickness of any person as a result of any accident involving a non-owned vessel, but always excluding liability to employees of the BIM.

Please note that a General Liability policy will remain in effect for the premises exposure.

This Terminal Operators policy is generally extended to cover the liabilities of the Stevedores which will protect BIM if they are acting as Stevedores and handling the loading and unloading of the cargo. As a Stevedore, BIM may damage a vessel during the loading and unloading of the cargo.

Generally key exclusions under the Terminal Operator's Policies include:

a) for any loss or damage to property owned, leased or rented by the Insured, except as to vessels or craft not owned by the Insured and for which the Insured is liable

b) for loss, damage or expense arising out of the operations of any vessel or craft owned by the Insured or any affiliated or subsidiary Insured

c) in respect of any loss or liability arising from forged warehouse receipts;

d) for loss or damage caused by or resulting from:

- hostile or warlike action in time of peace or war including action in hindering, combating or defending against an actual, impending or expected attack
- by any government or sovereign power (de jure or de facto) or by any authority maintaining or using military, naval or air forces; or
- any weapon of war employing atomic fission or radioactive force whether in time of peace or war;

- insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence, seizure or destruction under quarantine or customs regulation, confiscation by order of any government or public authority, or risks of contraband or illegal transportation or trade.