

Project Description / Environmental Impact Statement

MS FRAM

“The Northwest Passage -
In the Wake of Great Explorers 2018”

Voyages CENFRNWP1801 (Westbound) and
CENFRNWP1802 (Eastbound)

Operator:

Hurtigruten AS



Prepared for the
Nunavut Planning Commission
and the
Nunavut Impact Review Board

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1. Title:

The Northwest Passage – In the Wake of Great Explorers 2018 – Voyages CENFRNWP1801 (Westbound) and CENFRNWP1802 (Eastbound)

2. Contact Name and Address

This document was prepared by an outside consultant. (Ref. Section 3.) It is the responsibility of the Operator to ensure compliance with the activities outlined in this environmental impact statement.

Inquiries should be directed to:

OPERATOR:

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3. Disclosure

OUTSIDE CONSULTANT:

Expedition Voyage Consultants Ltd.
Knox House
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Douglas, Isle of Man, IM1 2PT, United Kingdom
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Contact Name: Victoria Wheatley
Contact Title: Consultant
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Email: Victoria@expeditionvoyage.com

Ms. Wheatley has been active in the expedition cruise industry since 1986 and has participated in well over 150 sea voyages to remote destinations around the world including all seven continents. She has authored a number of Environmental Impact Assessments and Project Descriptions for the Canadian Arctic and is sought after for her expertise with permitting and regulatory matters and for planning ship operations in remote and sensitive sea areas.

This assessment has considered the range of activities as disclosed by the Operator at the time of submission. New activities will be elaborated upon as information becomes available and the details advised in updates as appropriate. Any activities not assessed are the responsibility of the Operator.

4. Approvals – Regulatory and other Permits / Licenses / Authorizations

Territorial:

- Nunavut Planning Commission Review Board Screening * file #144834
- Nunavut Impact Review Board screening * pending referral by the NPC
- Tourist Outfitter's License (Govt. of Nunavut Dept. of Economic Development & Transportation)
License #2018.OL.235.019 received 24 May 2019
- Economic Benefits Pre and Post Report (Govt. of Nunavut Dept. of Economic Development & Transportation) * submitted
- Consent to Public Disclosure of Tourism Information (Govt. of Nunavut Dept. of Economic Development & Transportation) * submitted
- Registration as an Extra-Territorial Corporation * pending
- Worker's Coverage (WSCC Exemption) (Govt. of Nunavut, Dept. of Justice) * pending
- Wildlife Observation License (Govt. of Nunavut Dept. of Environment) * pending
- Qikiqtani Land Use License (Qikiqtani Inuit Association) * pending
- Kitikmeot Land Use License (Kitikmeot Inuit Association) * pending

5. Introduction

Hurtigruten AS (hereafter Hurtigruten) has advertised and is selling on the retail market and on the worldwide web (www.hurtigruten.com) the following voyages aboard MS FRAM during summer 2018:

“The Northwest Passage – In the Wake of Great Explorers – Westbound”

Voyage #CENFRNWP1801

Kangerlussuaq, Greenland to Cambridge Bay, Nunavut

29 August – 10 September 2018

Details: <https://www.hurtigruten.com/destinations/northwest-passage/the-northwest-passage-in-the-wake-of-great-explorers-westbound/>

“The Northwest Passage – In the Wake of Great Explorers – Eastbound”

Voyage #CENFRNWP1802

Cambridge Bay, Nunavut to Kangerlussuaq, Greenland

10 – 22 September 2018

Details: <https://www.hurtigruten.com/destinations/northwest-passage/the-northwest-passage-in-the-wake-of-great-explorers-eastbound/?tab=itinerary>

Background on the company and special operations staff is provided in Section 6.

The Voyage Plans have been included as **Appendix A**. The Route Maps have been included as **Appendix B**. A vessel questionnaire is included as **Appendix C**.

Westbound itinerary overview:

Guests will embark the vessel in Kangerlussuaq, Greenland on 29 August 2018, then spend two days exploring Sisimiut and Ilulissat. The vessel will enter Nunavut waters on 02 September 2018 at Sam Ford Fjord, however this day will be spent doing scenic cruising and wildlife watching. No shore landings will be made since the vessel will not have completed customs and clearance formalities. The vessel will clear into Nunavut (Canada) at Pond Inlet on 03 September. Wilderness landings and/or exploration are planned for Eclipse Sound (Milne Inlet), Dundas Harbour, Croker Bay, Radstock Bay, Beechey Island, Fort Ross, Conningham Bay, and James Ross Strait. Details are provided in Section 7.m. Organized port calls are planned for Pond Inlet (03 September), Gjøa Haven (09 September) and Cambridge Bay (10 September), where guests

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will disembark. After embarkation in the morning, guests will be transferred to the airport from their flight to Montreal.

On the Westbound voyage, from Pond Inlet to Cambridge Bay, we will be joined by Cambridge Bay elder (Ms) Navalik Tologanak, who will serve as a cultural interpreter and guest lecturer.

Eastbound itinerary overview:

Guests will embark the vessel in Cambridge Bay on 10 September 2018 after arriving by flight from Montreal. Organized port calls are planned for Gjøa Haven (11 September) and Pond Inlet (17 September) where the vessel will clear customs and immigration. Between the dates of 12 – 16 September, wilderness landings and/or exploration are planned for James Ross Strait, Conningham Bay, Fort Ross, Radstock Bay, Beechey Island, Croker Bay and Dundas Harbour. On 17 and 18 September (following clearance from Nunavut), the vessel will continue its exploration of Nunavut however no shore landings are planned to be made in either Eclipse Sound (Milne Inlet) or Sam Ford Fjord.

On the Eastbound voyage, from Cambridge Bay to Pond Inlet, we will be joined by Cambridge Bay elder Jimmy Evalik, who will serve as a cultural interpreter and guest lecturer.

Section 7 provides a summary of the Proposed Development. Operations have been planned to be fully self-sufficient and according to Canadian legislation, with activities managed by experienced officers, crew and expedition staff and to be within the search and rescue (SAR) capability of the Operator, including for medical evacuation, if required.

Further details are provided in Section 7.l. Details on Expedition Operations (Activities Away From Communities) are provided in Section 7.m.

Activities feature a combination of on board and off ship activities with the goal being to provide a well-rounded educational experience. Activities include educational presentations, small boat cruising, shore landings in wilderness areas for small group guided exploration and kayaking.

Equipment to be used is provided in Section 7.f.

Section 8 provides information on the Operator's commitments. Section 9 deals with Technology (ref. also Section 7.f.).

Section 10 identifies alternatives that have been considered including:

- Alternative 1: Changes to itinerary
- Alternative 2: Changes to number of guests
- Alternative 3: Changes to vessel and auxiliary craft used
- Alternative 4: Changes to activities
- Alternative 5: Alternative of not proceeding with the planned cruise program

On the leg from Pond Inlet to Cambridge Bay, we will be joined by Cambridge Bay elder (Ms) Navalik Tologanak, who will serve as a cultural interpreter and guest lecturer.

None of these alternatives are justified and all have been rejected for environmental, logistic or commercial reasons.

Section 11 identifies traditional and other land uses and potentially affected communities. Section 12 identifies community, co-management, Inuit organizations and government engagement and consultation.

Section 13 provides an analysis of potential significant negative environmental impact; Section 14 any likely cumulative environmental impacts. Section 15 the likely environmental impacts,

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including an assessment and minimization and mitigation that could likely result from each proposed activity.

Section 16 discusses clean-up, reclamation disposal and/or decommissioning plans.

Section 17 provides additional information.

A series of Appendices is included to provide further information.

An Addendum provides supplemental information for Nunavut.

Conclusion:

Direct, indirect and cumulative impacts of the proposed activity have been considered, as have alternatives. Provided that minimization and mitigation measures are adhered to, it is concluded that the proposed activity will have not more than a minor or transitory impact on the environment to be visited, including associated and dependent ecosystems, and that the activity should be authorized/permited to proceed.

6. Company Background and Special Operations Staff

Company background:

Hurtigruten AS is one of the world's leading operators in exploration travel in polar waters. With a 13-vessel fleet Hurtigruten explores Antarctica, Greenland, Spitsbergen, Iceland, Norway, the Canadian Arctic and Eastern Canada. Hurtigruten operates the classic coastal route on the Norwegian coast, known as "The world's most beautiful voyage". The route between Bergen and Kirkenes is operated by 11 ships, with daily departures from Bergen in an 11-day rotation schedule. The service is year-round and includes 34 ports of call northbound and 33 ports of call southbound. Hurtigruten's explorer vessel MS Fram (2007) runs expedition cruises to polar destinations such as Greenland, Antarctica, Iceland and Spitsbergen. The ship has a capacity of a maximum of 318 guests, experienced expedition staff and a wide portfolio of onboard activities, landings and excursions. In 2015 Hurtigruten almost tripled their available capacity when launching MS Midnatsol as their second ship to Antarctica in the 2016/17 season. MS Midnatsol will have Punta Arenas Chile as turnaround port. MS Spitsbergen has been rebuilt and put into Arctic expedition service from the 2016 season. In addition, Hurtigruten owns the travel operator Hurtigruten Svalbard (formerly Spitsbergen Travel), located in Longyearbyen. Offering land based all year Arctic experiences, including conference facilities, group tours and individual programs, Hurtigruten Svalbard owns Spitsbergen Travel Hotel AS, running three hotels in Longyearbyen.

Details on the company can be found at www.hurtigruten.com.

Information on MS FRAM can be found at: <https://www.hurtigruten.com/ships/ms-fram/>.

Hurtigruten is a full (voting) Member in good standing of the Association of Arctic Expedition Cruise Operators (www.aeco.no), currently chairing the Executive Committee (Jørn Henriksen), having joined the association in 2007. Founded in 2003, AECO is an international association for expedition cruise operators operating in the Arctic and others with interests in this industry. The association is dedicated to managing responsible, environmentally-friendly and safe tourism in the Arctic and strives to set the highest operating standards.

Hurtigruten's operations staff:

Hurtigruten's operations staff, at all levels, have extensive background and experience in applying specific measures to avoid environmental impacts. The employees for whom biographical

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sketches are provided will be actively involved in planning, managing and operating the planned cruise of MS FRAM.

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Name: Mr. Jørn Henriksen
Title: Head of Polar Operations and Environment



Basing his current job on 13 years' experience working as an expedition leader in the Polar Regions, including Arctic Canada, Greenland, Svalbard and Antarctica, he is currently working with product development, itinerary planning and environment in Hurtigruten's office.

Name: Ms. Guro Storhaug Christiansen
Title: Operations Manager Explorer



Guro joined Hurtigruten two years ago after working with operations and safety in the offshore industry for 10 years. Working at Hurtigruten brings her back to the origin and the main reason for wanting a career as a naval architect; namely ship design and marine safety. She currently holds the position as Operations Manager for Hurtigruten's Explorer ships.

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Name: Ms. Karin Strand

Title: Field Operation and Expedition Teams Manager and Expedition Leader



Karin grew up among the Norwegian Fjords and glaciers in Jølster. She moved to Bergen in 1991, where she studied law at the University of Bergen. Karen changed her career plans due to passion of traveling and the oceans. No better place to be than Hurtigruten. She has worked on various ships in the fleet on various routes. Karen joined MV Nordnorge's first adventures to Chile & Antarctica in 2002. Karen suffers from permanent polar fever and roams the Polar Regions south and north throughout the year from Greenland, Svalbard and Antarctica, both when she is on the ship and in her time off. She is a keen kayak paddler and spends a lot of her time paddling in oceans and rivers in different parts of the world. A three-week Antarctica paddling journey was completed in 2016. Hiking is another passion. In 2013, she and two friends walked the Arctic Circle Trail in Greenland: 163km in 8 days carrying all of their food, tent, etc., in their backpacks. The polar fever gets stronger every year.

Name: Captain Ole Johan Andreassen

Title: Master, MS FRAM

Please refer to the next page.



OLE JOHAN ANDREASSEN

Captain

EN Already when I was in primary school I made the decision that I want to work at sea. Before me, my father, Uncles, brothers and my sister was sailing. So I started in Hurtigruten in 1977 as deckhand , AB and Bosun and also in the engine room. After some years I completed my maritime education, and graduated in 1999.

My navigation career consists of sailing on the coast of Norway for some years, and I have also 9 seasons in Antarctica with MS Nordnorge, MS Nordkapp and MS Fram. In addition I have also sailed on Svalbard, Greenland, and around in Europe.

The main focus I have, is safe sailing, take care of all our passengers, crew, environment. I also care much about creating a good environment on the ship and give good experiences for the passengers.

7. Summary of the Proposed Project Development

7.a. Overview

This project description aims to provide a non-technical summary and to evaluate environmental aspects of Hurtigruten's proposed project development in Nunavut during summer 2018 with their expedition cruise ship, MS FRAM, to ensure compliance with requirements under Canadian legislation in the area the vessel will visit.

Details on the voyages, including web references, have been provided in Section 5. The Operator intends to transit through Nunavut waters, to the Qikiqtani and Kitikmeot Regions, with one passenger vessel (MS FRAM) for two voyages between the dates of 02 – 18 September 2018. Clearance into Nunavut will be at Pond Inlet on 03 September (Westbound voyage). The voyages turnaround in Cambridge Bay on 10 September. Clearance out of Nunavut will be at Pond Inlet on 17 September (Eastbound voyage).

Expedition stops in wilderness areas are planned. Details have been included in Section 7.m. Pre-arranged visits to communities (Pond Inlet, Gjøa Haven and Cambridge Bay) are also planned (ref. Section 7.l.).

The voyages are proposed to occur during a period of minimum sea-ice in Nunavut waters. Sea-ice will be avoided if at all possible.

It is not anticipated that wildlife habitat will be disturbed.

The scope of the project includes the following undertakings, works or activities within the Nunavut Settlement Area:

- Transportation and accommodations for approximately 398 people (up to 318 guests and 80 crew, which includes an expedition staff of 15), aboard the MS FRAM per cruise;
- Use and storage of approximately 465m³ litres of diesel fuel aboard the vessel per cruise;
- Use of up to 7 Polarcircle tender boats (5 with capacity for 8 persons each including the driver + 2 with capacity for 12 persons each including the driver), small auxiliary boats for short sightseeing excursions and ship-to-shore transportation;
 - Use and storage of approximately 348 litres (3 x 116 litres) of diesel fuel for use for the inflatable boats during each excursion;
- Use of up to 6 double kayaks plus 2 single instructor kayaks for sightseeing kayak excursions;
- Shore landings, via cruise ship or small auxiliary boats,
- Shore-based activities in wilderness areas (apart from communities).

Information on the expedition team staffing has been included in Section 7.k., however the staffing was still being finalized at the time of this submission, so changes may occur between now and sailing.

The cruise has been planned with a high degree of sensitivity to the local communities. As previously advised, community visits have been planned for Pond Inlet, Gjøa Haven and Cambridge Bay. Principals from the Company have been in close coordination with their contracted agents (ref. Section 7.k.) to set up the arrangements and to work with local and emergency officials at the federal, regional and local levels to discuss and finalize plans for the voyage. Consideration has also been given to Traditional knowledge - Inuit Qaujimagajatuqangit, and potential impact to communities nearby. Principals from the Company (ref. Section 6) are active in the industry and have worked with local and emergency officials at the federal, regional,

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and local levels to discuss and finalize plans for the trip. Details are provided elsewhere in this document.

Where applicable, Federal and/or Territorial permit, license and authorization applications will be submitted in advance to the appropriate authorities; copies will be carried on board.

The possibility of potential impacts will be minimized by strict adherence to applicable laws and regulations; company policies and standard operating policies; careful pre-trip planning and briefings; advice received from the Nunavut Planning Commission and Nunavut Impact Review Board, public and community input; and implementation of mitigation measures and the supervision and monitoring of visitor activities in the field by experienced personnel. It is anticipated that the proposed voyages will have an environmental impact that not more than minor or transitory.

Expedition operations (activities away from communities) are detailed in Section 7.m. A team of lecturers and naturalists will provide an in-depth educational program through a series of on board enrichment presentations and briefings and in small group guided field interpretation. Site visits will occur in strict adherence with applicable regulations, permit conditions and/or guidelines. Guests will be briefed in advance and activities closely monitored.

7.b. Project Location

As noted in Sections 5 and Section 7.a., the proposed development will occur in the Qikiqtani and Kitikmeot Regions of Nunavut, with community visits are planned for Pond Inlet, Gjøa Haven and Cambridge Bay.

No known Environment Canada – Canadian Wildlife Service Protected Areas (National Wildlife Areas or Migratory Bird Sanctuaries) are planned to be visited, nor are there any known protected areas with a marine component.

7.c. Voyage Plan and Route Map

The Voyage Plans are included as **Appendix A**.

Preliminary Route Maps are attached as **Appendix B**. The routes taken will be subject to change based on weather, ice and other conditions.

7.d. Appointed Port Agent

Hurtigruten's appointed port agent for MS FRAM while in Nunavut is:

Inchcape Shipping Services
General Address:
620 Bord du Lac
Suite 304
Dorval, Quebec, Canada H9S 2B6
Phone: [+1 514 861 1216](tel:+15148611216) (24 Hours)
Fax: [+1 514 861 1113](tel:+15148611113) or [+1 866 421 9374](tel:+18664219374)
Telex: 6737679 ISS MTL (US Telex No.)
Email: iss.montreal@iss-shipping.com

Jason C. Skorski
General Manager - Eastern Canada
Inchcape Shipping Services
(As Agents Only)
Office: [+1 514 861 1216](tel:+15148611216) - 24 hours

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Office Email: iss.montreal@iss-shipping.com
Personal Email: jason.skorski@iss-shipping.com
Website: www.iss-shipping.com

7.e. Proposed Activities at Project Location

The location of the planned activities has been outlined in Sections 5 and 7.b. The proposed activities feature a combination of small auxiliary boat cruises, wilderness shore landings, with visits conducted in small groups, and pre-organized community visits. The proposed shore landings will be guided by members of the expedition team and with groups rotated throughout the duration of the landing. Further information may be found in Sections 7.l. and 7.m. Kayaking will be offered to limited numbers of participants in select locations, dependent upon favorable weather conditions. Further information may be found in Sections 7.f. and 7.k.

7.f. List of Equipment to be Used

MS FRAM

Detailed information on the vessel has been included in a Vessel Questionnaire, which has been included in **Appendix C**.

Navigation:

Details on the MS FRAM's navigational equipment can be found in **Appendix C**.

Weather and Ice Information:

Weather and ice information is obtained by the ship through government and private services by means of telex, fax, voice, Internet and e-mail communications. The ship subscribes to a private weather information service, which sends updated weather daily by e-mail providing current weather, sea conditions and forecasts for up to ten days. Additional ice information can be requested as well as a ship's routing service.

Safety:

MS FRAM is Ice Class 1B. The vessel will seek to transit only open water and areas with limited ice floes.

Emergency Capacity:

MS FRAM has life saving appliances for 318 passengers and 80 crew. 240 guests and 80 crew (including 15 members of the expedition team) are expected per voyage. 300 persons can be accommodated in two partially closed, motorized lifeboats. The ship can accommodate an additional 424 persons in two inflatable life rafts. This means the ship will enter Canadian Arctic waters with excess emergency capacity.

Medical facilities:

MS FRAM frequently operates in places which are up to three days traveling distance from land support. Thus, the vessel is staffed and equipped to handle most medical emergencies. Stabilizing medical care is provided until patients can be safely disembarked to a land facility offering equal or superior care. Medical staff aboard MS FRAM for the duration of the cruise will consist of one Doctor and two Registered Nurses.

The ship has an intensive care unit equipped with cardiac monitor/defibrillator, lab capability, x-ray, a well-stocked Pharmacological unit, and two hospital beds. Emergency response capability and 24 hour on-call personnel are provided. The company has experience in arranging helicopter or fixed wing air ambulance transfers for critical patients.

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Additional information on SAR Arrangements, Emergency Response and Contingency Planning may be found in Section 7.n.

Auxiliary boats for sightseeing and shore landings:

Auxiliary equipment/personnel aboard the MS FRAM to support the expedition operation includes:

5 Polarcircle boats – each of capacity of 8 persons including driver

Manufacturer: Helgeland Plast (Akva Group)

Engine type: 4-stroke Yamaha 80 Hp

2 Polarcircle boats – each of capacity of 12 persons including driver

Manufacturer: Helgeland Plast (Akva Group)

Engine type: 4-stroke Yamaha 200 Hp

The tender boats will be used to provide transport between ship and shore and small-group guided exploration of remote shores. Each is equipped with safety equipment and fuel-efficient engines that comply with all environmental protection standards and minimize noise, thereby mitigating impact to wildlife.

Safety equipment in the tender boats includes:

- First aid kit (prepacked and water tight)
- Emergency Kit (basic survival kit)
- Hand flares (3)
- Parachute rocket signal (1)
- Parachute anchor
- Basic tools for the engine
- Fire extinguisher
- Ropes and lines
- One towing line forward and one astern, ready for use
- Drift (or sea) anchor
- Paddle oar
- Navigation lights (fixed)
- Boatman's hook
- GPS

Standard operating procedures are in place for the activity.

Kayaks:

Quantity: 6 double, 4 single

Equipment:

- Paddles 16 yellow, 13 black
- Dry suits: 6S, 7 M, 7 L, 7 XL, 4 XXL
- Polar-Tec Fleece suit 6S, 7M, 7L, 7XL, 4XXL
- Lifejackets 9S/M, 13L/XL, 6XXL
- Neoprene Shoes size 39 7 pair, 40/41 10 pair, 42 3 pair, 43/44 10pair, 45 4 pair, 46/47 4 pair, 48 3 pair
- Neoprene Gloves 8XL, 7L, 10M, 5S
- Spray skirts 5
- Tow lines 3

Operations will be conducted in small groups to be led by two kayak masters (in single kayaks) and support staff in a rescue boat (outfitted with safety equipment), which will accompany the

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groups at all times. Experience is required for single kayak, but no experience is required for double kayaks – that is open for all.

Safety equipment includes drift anchor, first aid kit, hypothermia kit, extra paddle, VHF radio, satellite phone, handheld GPS and extra base layer clothing for the paddler.

Kayakers are equipped with dry suits and fleece liner suits for warmth, neoprene 2-finger gloves/mittens, neoprene paddling shoes, paddling life jackets.

Standard operating procedures are in place for the activity. Participants sign a Medical and Legal Waiver and participate in an on-board safety briefing conducted by the kayak masters prior to being allowed to participate in the activity.

Other auxiliary equipment includes:

Fast Rigid Rescue Boats:

2 MOB boats – each of capacity of 6 persons

Manufacturer: Norsafe, model WHFRB 6, 5 DJ

Engine type: Bukh+Steyr144VT 4 stroke engine

Safety equipment includes: 2 oars or paddles; buoyant bailer; binnacle containing an efficient luminous compass; sea anchor with tripping line not less than 10 m in length; painter of sufficient length and strength at fore end; buoyant line not less than 50 m in length and strength to tow a liferaft; waterproof electric torch suitable for Morse signalling; spare set of batteries and spare bulb in waterproof container, whistle or equivalent; first-aid outfit in waterproof case; buoyant rescue quoits attached to buoyant line of not less than 30 m in length; portable fire-extinguishing equipment of an approved type (suitable for oil fires); searchlight able to operate continuously for at least three hours, radar reflector; thermal protective aids for 10% or 2, whichever is greater; boat hook; bucket; and knife or hatchet.

Approved by Bureau Veritas.

7.g. Environmental Practices

Hurtigruten has a long tradition of operating in both environmentally-sensitive areas and in waters in which ice conditions exist. Past sailings include Antarctica and substantial part of its operations have been in the Norwegian Fjords, Spitsbergen, Greenland and Iceland. Operations in environmentally-sensitive areas have consistently demonstrated its commitment to strictly observing stringent standards and requirements for protection of the environment. To date, the company has conducted 185 trips to Antarctica and 37,000 trips to the Arctic.

With the implementation of MARPOL Annex IV in 2006, Hurtigruten has scrupulously adhered to specific environmental criteria, including prohibitions on smoke emissions, burning of trash, ballast pumping, and sewage dumping and when feasible, has exceeded regulatory requirements.

In a continuous effort to monitor, verify and improve its operational standards, Safety, Security and Environmental audits are carried out yearly on all vessels in the Hurtigruten fleet. These audits are performed internally by company officers and externally by DNV GL to ensure compliance with company policies and national and international regulations.

7.h. Fuel and Hazardous Material Use

During the entire transit MS FRAM will not carry on board any heavy fuel oil.

Details of fuel use follows.

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MS FRAM:

Fuel type: Low Sulfur Marine Gas Oil (Built-in ship's storage tank)
Estimated Daily Consumption (at sea, maneuvering and port): 21 cbm
Estimated amount of fuel to be carried: 284 cbm

Capacity of Marine Diesel Oil:

FO03S FO SETTLE TK 3S	24.2
FO04S FO SERV TK 4S	12.1
FO03P OVERFLOW TK 3P	10.1
FO01P OVERFLOW TK 1P	17.0
FO05S FO SERV TK 5S	14.9
FO01C FO TANK 1C	113.3
FO02C FO TANK 2C	101.0
FO02P FO TANK 2P	66.7
FO02S FO TANK 2S	66.7

Subtotal 426.1cbm

Capacity of Diesel Oil:

DO01S DO SETTLE TK 1P	31.2
DO03S DO SERV TK 3S	13.9
DO04P DIESEL OIL TK 4P	22.0
DO05P EM.DIESEL OIL TK 5P	6.8

In addition, lubricating oils will be carried aboard the vessel for ship use.

AUXILIARY EQUIPMENT:

Polarcircle Tender Boats:

Fuel type: Diesel fuel

Number of containers and capacity of containers:

- 7 x 116 Liter tanks carried in total. Minimum of 1 tank to be aboard each boat during operations.

Estimated Use (in Liters):

- Maximum of 70 Liters per operations day per inflatable

Proposed storage methods:

- All fuel is stored in the main fuel tanks on the vessel. (Fuel is obtained by using a "straw" down into the main MGO tank of the ship.)

Fast Rigid Rescue Boats:

Fuel type: Diesel fuel

Number of containers and capacity of containers:

- Each boat has a fixed tank containing 165 Litres of diesel fuel

Estimated Use (in Liters):

- Maximum of 25.4 Liters per operations estimated
- Estimated amount of fuel to be carried: 160 Liters (per boat)

Proposed storage methods:

- All fuel is stored in the main fuel tanks on the vessel. (Fuel is obtained by using a "straw" down into the main MGO tank of the ship.)

7.i. Waste Disposal and Treatment Methods

The proposed activity will result in wastes being generated during the course of normal ship operation.

Liquid wastes include:

- Domestic waste water (e.g. from cooking and cleaning activities),
- Sewage,
- Macerated food waste, and
- Oily Mixtures.

Solid wastes will also be generated, including:

- Garbage (e.g. waste paper, clean packaging materials, glass and wood from domestic and work activities on the vessel),
- Food waste (e.g. excess or spoiled food waste which is not suitable for maceration), and
- Hazardous or special waste (e.g. batteries, paints, oils, oily rags, etc., from maintenance or other work on the vessel).

Other sources of waste include ballast water and anti-fouling paint.

The program has been planned taking into consideration relevant provisions of MARPOL and the *Arctic Waters Pollution Prevention Act* (AWPPA) (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c.354/). With the exception of grey and black water, all wastes will be retained on board for disposal outside of the Arctic to comply with Canadian legislation. Grey and black water will only be discharged well outside 12NM from shore, none while near communities, and both will have been treated by an EVAC MSP VIII-sewage treatment system prior to discharge. Additional information can be found in the Vessel Questionnaire included as **Appendix C**.

All hazardous wastes, including waste oil, will receive proper treatment and disposal at an approved facility. This meets with recommendations of Environment and Climate Change Canada.

The Company is aware of the Transportation of Dangerous Goods Act, 1992 <<https://www.tc.gc.ca/eng/tdg/act-amendedact-69.htm>> and Transportation of Dangerous Goods Regulations <https://www.tc.gc.ca/eng/tdg/safety-menu.htm> and that a waste manifest or the appropriate transportation of dangerous goods (TDG) documentation must accompany all potential hazardous samples and/or materials that are transported off site, if applicable. Further, the shipment of waste, if applicable, must be registered with the Government of Nunavut Department of Environment (GN-DoE).

An authorization or letter of conformation of disposal from the owner/operator of the landfill to be used for disposal of project-related wastes will be obtained.

7.j. Spill Prevention Plan

Local and regional contamination of the marine and coastal environments and their dependent ecosystems could result as a direct effect of any spill. Historically it has been shown the overwhelming percentage of spills by volume comes from a few large spills by tankers offshore. Other than the large spills the majority of small ones occur while alongside a terminal and not while underway. Generally, the trend overall is clear, the average number of spills continues to decline. According to the International Tanker Owners Pollution Federation, who maintains statistics on this, in the ten years from 2002-2011 the number of spills was halved, continuing a trend from 1970.

Provided spill response procedures are followed, in the rare instance of a spill at sea the effects can be minimized. The most effective methods for minimization and mitigation are having a dedicated emergency contingency plan, ensuring strict adherence to established standard operating procedures, having an oil spill equipment on board, and effective containment procedures, spill contingency planning, and effective communications.

Oil spill prevention and response are given the highest degree of importance on Hurtigruten ships. Central to preventing oil spills is operating ships in accordance with the ships established procedures whenever the handling of oil or other hazardous substances are involved. The company's Safety Management System (hereafter SMS) addresses protection of the environment by requiring officer and crew compliance with specific standards and procedures necessary to ensure the safe management and operation of ships. As required by Annex I of MARPOL 73/78, an approved Shipboard Oil Pollution Emergency Plan (hereafter SOPEP) is in place on the vessel to contain and clean-up an incident involving release of fuel or oil.

Under the *Arctic Waters Pollution Prevention Act* (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._354/), penalties of up to CDN \$5,000 (in the case of a person) and, in the case of a ship, up to CDN \$100,000, can apply for a vessel owner, and/or operator or individual crew member who are found guilty of illegally discharging oil in the Canadian Arctic. It is up to the court to determine the penalty for a specific conviction.

Six sets of wet suits, boots and gloves are provided for crew involved in oil spill clean-up. Absorbent pads, plastic bags, saw dust, Aquabreak PX degreaser (low toxicity, non-caustic, multi-purpose, free from hydrocarbon solvents as well as biodegradable), shovels and chemical pump are carried on MS FRAM. Each calendar quarter, the ship performs oil and chemical spill response drills. Drills focus on containment, notification, clean-up and personnel safety requirements.

Some additional applicable SMS and SOPEP requirements include:

- All Deck Officers have attended Bridge Resource Management (BRM) training in accordance with requirements from Norwegian Maritime Authorities.
- Every three months, MS FRAM performs a fire/oil and chemical spill response drill as provided in the ship's SOPEP. Drills are supplemented with weekly safety training sessions; topics may include pollution response, response to spills of hazardous materials on board, oily bilge water management and personnel safety requirements.

7.k. Field Management

As noted in Section 6, the Expedition Leader is Karin Strand. She will be assisted by a highly-experienced expedition team. Lecture topics include Ornithology, Inuit Culture, Inuit Art, Botany, Geology, Climate Change, History and Exploration, Photography, Marine Mammals and other topics of interest to Natural History. On the Westbound voyage, from Pond Inlet to Cambridge Bay, we will be joined by Cambridge Bay elder (Ms) Navalik Tologanak, who will serve as a cultural interpreter and guest lecturer. On the Eastbound voyage, from Cambridge Bay to Pond Inlet, we will be joined by Cambridge Bay elder Jimmy Evalik, who will serve as a cultural interpreter and guest lecturer.

The Expedition Leader is responsible for coordinating the expedition operations with the Captain and Chief Officer, including activities that will utilize the auxiliary boats and kayaks.

A list of expedition staff, including their biographical sketches, is included as **Appendix D**. As stated previously, the staffing was still being finalized at the time of document submission, so the

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list is current as of submission date. Changes may also occur once this document has been submitted. For a current list of staff, please contact the Company directly.

7.1. Operations Ashore in Communities

Community visits are being pre-arranged with contacts in each of the communities

Activities will follow the guidelines laid out in the Government of Nunavut “Visitor Code of Conduct” and “Operator Code of Conduct,” as provided by Cruise Nunavut, as well as the Association of Arctic Expedition Cruise Operators (AECO) Community Guidelines (<https://www.aeco.no/guidelines/community-guidelines/>).

7.m. Expedition Operations (Activities Away From Communities)

In General:

At selected wilderness locations, guests will be able to participate in guided visits to sites of historic and wildlife interest and to view flora and striking scenery. In some cases, off ship activities may include naturalist-guided walks or hikes for physical activity. Boat tours without a shore landing are planned.

In all cases, the Expedition Leader is responsible for coordinating and overseeing the off-ship activities and will brief guests in advance about activities and appropriate dress, and in cases when a shore landing is made, the briefings will include information about behavior ashore, guidelines to follow and biosecurity measures (see below). Briefings may be augmented by maps, digital photography and sometimes video footage to further explain highlights, area(s) of operation, restrictions and landing conditions.

Prior to guests going ashore, the Expedition Leader and the expedition staff (including the Bear Guards) make a reconnaissance of the landing site with the specific purpose of evaluating environmental and safety considerations.

A distinguished team of lecturers and naturalists provides an in-depth educational program through an on-board series of presentations to enhance the guest's understanding and appreciation of the sites they will be visiting to inform guests in advance and to serve as guides ashore and to interpret on their area of expertise during auxiliary boat tours. Experienced expedition guides with expertise in the areas being visited will be sought.

Expedition activities will be conducted in a manner that do not interfere or disturb any Inuit harvesting activities, and in a manner so that no new trails or walking paths shall be created at any site that is visited.

Protective firearm usage for polar bear security will apply to activities outside communities. The Company has developed a Polar Bear Safety Manual, which is available upon request. (Additional information on Wildlife Protection may be found in Section 7.p.) Landings will be evacuated should polar or grizzly bears or other predators be discovered in, or approaching, the landing areas. No camping or hunting will occur and no food other than emergency supplies will be taken ashore. Landings in wilderness areas will also follow the recommendations in the Association of Arctic Expedition Cruise Operators' Polar Bear Guidelines (<https://www.aeco.no/wp-content/uploads/2017/10/AECO-wildlife-polarbear-p4-1.pdf>) except that distances involving polar bears will follow the distances recommended by Government of Nunavut (ref. Section 7.p.). Guests will be briefed in advance, supervised in small groups while ashore and their activities closely monitored.

Archaeological and Historical Site Visits:

A Class 1 Archaeological Permit has been applied for with Government Nunavut's Department of Culture and Heritage. The staff archaeologist (Dr. Tim Rast) will develop guidelines for visitors in conjunction with the Expedition Leader, based on the guidance provided by Government

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Nunavut's Code of Conduct for Operators and AECO's Operational Guidelines (<https://www.aeco.no/wp-content/uploads/2017/11/2017-06-26-AECO-Operational-Guidelines-2016.pdf>). His biographical sketch has been included in **Appendix D**.

Visitation on archaeological and historical sites will be limited a maximum of 100 guests, with only 25 guests at any one time being allowed to view the actual remains.

Boat Tours:

Naturalist-interpreted sightseeing and wildlife watching tours will be offered when the Polarcircle tender boats are not being used for landing operations. These are a very good way to see the coast and wildlife with minimal physical activity and minimal impact to the environment. Norwegian Coast Guard approved flotation devices will be worn. Boat operators will have safety and recovery equipment and be in communication with the vessel throughout the operation. Standard operating procedures are in place and are available upon request.

Guided Kayak Excursions:

Guests will have been briefed aboard the vessel and pre-screened for the activity.

Kayaks will be deployed via a racking system from MS FRAM and towed to the launch area, which will likely be at the main landing area, although sometimes this is some distance from the main landing area (on shore) depending on topography. Kayaks can also be launched from a platform attached to one of the tender boats – this is the case where there is no landing beach to take the kayakers ashore – topography being steep cliffs or very rocky beaches.

The kayak party will prepare the kayakers prior to guest arrival. Kayaker groups will be shuttled to the launch area by Polarcircle tender boats. Ashore participants will be briefed and given final instructions before launching from the beach.

Kayaker groups will be guided by the kayak instructors in single kayakers on excursions of about 1.5 hours paddling time. The kayak groups will be accompanied at a discreet distance by a safety boat, with recovery equipment and VHF radio communications with the kayak instructors. Kayakers may land on suitable beach at the end of their tour or return to the original launch area. The group will be picked up and returned to the vessel. The next group will be brought from the ship and the procedure repeated. At the conclusion of the activity the kayakers and equipment will be returned to the vessel. Norwegian Coast Guard approved flotation devices will be worn. Standard operating procedures are in place and are available upon request.

Kayaker instructors and safety boat operators are briefed, as standard operating procedures, on the International Maritime Organization / Marine Safety Committee (IMO/MSC) "Guide to Cold Water Survival" for safety purposes (<http://navigation.gi/media/gst/2550214/MSC1Circ1185GuideForColdWaterSurvivalSecretariat.pdf>). The purpose of the guide is to examine the hazards of cold exposure that may endanger life and provide advice on how to prevent or minimize these dangers.

Biosecurity Measures (for wilderness shore landings):

The introduction of non-native plants from one landing site to another is a concern due to the potential transport of seeds via footwear and gear. This cruise will adhere to the Association of Arctic Expedition Cruise Operators (AECO) Biosecurity Guidelines (<http://www.aeco.no/guidelines/biosecurity-guidelines-2/>) by having guests and crew examine and clean clothes, footwear, and equipment thoroughly to remove seeds and organic matter before embarking on the cruise; and by thoroughly cleaning footwear, walking sticks or camera tripods with a disinfectant solution and using scrub brushes before disembarking and when returning to the ship from each wilderness landing. A boot washing station will be set up at the landing site as

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well as the disembarking embarkation point of the ship, to ensure all organic matter is removed between landings. (The disinfectant solution will also be used for dipping walking sticks and camera tripods.)

7.n. SAR Arrangements, Emergency Response and Contingency Planning

In General:

MS FRAM is a modern passenger cruise ship that is fully self-sufficient and meets all necessary requirements for an ocean-going ship. She has all valid international certificates issued by the country where the vessel is registered (Norway). The ship's components and machinery is built and maintained according to the standards required for the class of the vessel.

The vessel will be operated according to *The Canada Shipping Act, 2001* (CSA 2001) (<http://laws-lois.justice.gc.ca/eng/acts/c-10.15/>) and the *Arctic Waters Pollution Prevention Act* (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._354/) and their associated regulations established to provide minimum safety requirements and responsibilities that apply in all waters under Canadian jurisdiction, including Canadian Arctic waters.

Activities will be managed to be within the SAR and medical evacuation capability of MS FRAM'S resources. A detailed Emergency Response Plan to ensure appropriate contingency plans and sufficient arrangements for health and safety, search and rescue, and medical care and evacuation has been drawn-up and is in place for the proposed activity. This plan meets the requirements under the ISM Code, an international standard for the safe operation of ships and for pollution prevention. Chapter IX of the International Convention for the Safety of Life at Sea (SOLAS) requires compliance for the ISM Code. Under the Code, ships must have an established Safety Management System (SMS) in place. The ISM Code describes, in broad terms, what a ship operating company's safety management system needs to include. Other minimization and mitigation measures include IMO guidelines, AECO guidelines (discussed elsewhere) and standard operating procedures. These plans and arrangements are designed so as not to be reliant on support from other vessel operators or governments.

Hurtigruten recognizes that specific operations in the Arctic, such as ice and weather conditions can increase risk. Transport Canada's set of rules, including the Agency's "Guidelines for the Operation of Passenger Vessels in Canadian Arctic Waters – TP 13670 E" (last revision March 2005) (<https://www.tc.gc.ca/eng/marinesafety/tp-tp13670-menu-2315.htm>), <https://www.tc.gc.ca/media/documents/marinesafety/tp13670e.pdf> have been consulted to support safe marine operations in Arctic conditions.

As a member of the Association of Arctic Expedition Cruise Operators (AECO), the Company provides details on its planned itinerary in advance of the season to the Secretariat for the association's Ship Scheduler. This advance ship coordination has greatly simplified the work of the Expedition Leaders on board the vessels in having to coordinate with each other on the spot and has minimized overlapping schedules and is an important minimization and mitigation tool to reduce potential environmental impact. The pre-season schedules of the AECO fleet are generated by the Secretariat and circulated to all AECO member vessel and yacht operators. These pre-season schedules, along with other selected information, are circulated to MRCC's in the Arctic areas and selected others on the basis of a Memorandum of Understanding with AECO. Changes after the Scheduler closes are then the responsibility of the Expedition Leader to communicate to all other IAATO vessels and yachts operating in the vicinity to ensure others are aware of the change(s) to avoid any conflict in landing (to ensure no more than one vessel is at a site at any one time).

Medical:

See previous description of medical facilities in Section 7.f.

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Insurance:

Pursuant to the Package Tours Act, all organizers of package travels must provide security covering their obligation to refund monies paid and for the repatriation of the consumer in the event of the organizer's insolvency.

The security is normally given in the form of a bank guarantee, but the Fund may accept other adequate security.

According to the Norwegian Package Act a guarantee is required for three categories of travel arrangements:

1. "package travels"
2. "seat only"
3. Travel arrangements essentially similar to a package travel.

The Fund will cover all valid claims from customers if the security provided proves insufficient to cover the claims.

Wilderness and Polar Bear Safety:

Shore landings not in the immediate vicinity of a settlement have the potential to encounter a polar bear and perhaps other predators, as do boat tours. All expedition excursions in Nunavut outside of the communities will be accompanied by experienced polar expedition guides to ensure the safety of guests in these remote regions. Staff members will follow established procedures in the Company's Polar Bear Safety Manual. Guides will be equipped with firearms and other non-lethal bear deterrents. Polar bear lookouts will be posted around landing areas at all times. The staff member in the Kayak Safety Boat will carry a firearm and bear deterrents in case of a swimming bear. Some boat tours may require firearms and bear deterrents to be carried on board the tender boats (in high risk areas with a lot of ice). Additional information can be found in Section 7.p. - Wildlife Protection.

Stranding Safety:

Due to the need to be prepared for the potential of weather conditions or drifting ice to temporarily interrupt expedition landing operations, meaning that guests may have an extended stay ashore, stranding kits will be taken ashore on all landings to provide emergency shelter and basic survival equipment.

Search and Rescue:

In the unlikely event that maritime response efforts are required, MS FRAM and Hurtigruten will work with the Canadian Coast Guard, the Department of National Defence and Transport Canada, for the coordination of maritime response efforts. It is noted that the Canadian Coast Guard has primary responsibility for coordinating maritime search and rescue operations.

7.o. Security Plan

The *Marine Transportation Security Regulations* (MTSR) (<http://lois-laws.justice.gc.ca/eng/regulations/SOR-2004-144/index.html>) provide a framework to detect security threats and take measures to prevent security incidents that could affect marine vessels and their facilities. These regulations apply even for isolated and unmanned stops for MS FRAM while in Canadian waters, including Nunavut.

The Company's Safety Plan, under the ISM Code (<http://www.imo.org/en/OurWork/HumanElement/SafetyManagement/Pages/ISMCode.aspx>)

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includes procedures to be followed while the vessel is at anchor and while disembarking guests and includes an introduction, and covers corporate policies, safety management organization, and the safety management system (SMS). As not all aspects of the plan apply when the Vessel is in Canadian Arctic waters, the plan is only being briefly summarized.

Disembarking guests: The Officer of the Watch is responsible for all movements of guests. A deck officer will supervise each tender operation from the bridge wing. He/she informs the Captain of any boat launching, stowage, and "in/out" movements of guests, expedition team members and crew.

Guests will be checked prior to disembarking the vessel and any auxiliary craft to make certain they have donned their appropriate floatation device and that it is put on correctly in order that his/her movements cannot be hindered. A check will be made to ensure they are also dressed properly, have disinfected their footwear (and walking sticks and camera tripods) and have signed out according to the Vessel's sign-in/sign-out procedures.

Deck crew will assist with the embarkation/disembarkation of the tender boats. Guests will be transferred into the boats using the wrist-to-wrist method.

A continuous communication's link with the Captain or watch officer on the bridge is in effect during all auxiliary boating operations and shore landings.

Accounts as to the numbers on board and ashore are provided to the Officer of the Watch as per standard operating procedures.

7.p. Wildlife Protection

As identified on the Voyage Plan (**Appendix A**), Route Map (**Appendix B**) and in Section 7.b., the size of the geographical area includes marine and coastal areas in Nunavut in the area centered around southeastern Baffin Island and vicinity.

The proposed project would take place within habitats for various marine wildlife including fish populations, benthic invertebrates, and marine mammals, including *Species at Risk*.

Additionally, land-based activities may also take place within habitats for many far-ranging wildlife species such as caribou, muskox, wolves, polar bears, wolverine, grizzly bears, migratory birds, and *Species at Risk*.

As such, project activities may potentially affect both marine and terrestrial animal migratory patterns. Further information is provided in Section 15.e.

MS FRAM will make every effort to minimize underwater noise. Measures to limit noise include:

- Keeping ship speed no faster than required for safe navigation.
- Running at reasonably constant RPM.
- Limiting engine and machinery in operation to only what is required for safe passage.

To avoid harmful interference with wildlife, standard operating procedures are in place. In normal circumstances the vessel will not ordinarily approach the expedition landing sites closer than 1500 feet (500 meters).

The ship and its personnel will further seek to avoid wildlife disturbance by:

- Keeping an extra bridge watch when in areas known for wildlife activity.
- Reducing ship speed anytime whales or concentrations of other wildlife are seen nearby.
- Adhering to the Association of Arctic Expedition Cruise Operators (AECO) Guidelines for Visitors to the Arctic when in proximity of wildlife and Government of Nunavut recommendations (below).

- Advising crew and guests not to feed seabirds or other wildlife. This will be accomplished through in-cabin flyers, onboard announcements, lecture content, the Daily Program and through crew and guest education.
- Broadcasts through the outside public address system will be restricted and other distracting noises such as whistles and bells will not be used, except in emergency.
- On shore, guests will be informed not to disturb animals and birds. This includes avoiding making loud noises and keeping conversations low and calm. Group sizes will be kept to small numbers and with an appropriate guide-to-guest ratio to minimize impact. Guests will be briefed ahead of time and advised to follow the instructions of the Expedition Leader and their guides.
- Polar bear safety will be paramount. Guests will be instructed that polar bears are potentially dangerous animals -- but also vulnerable -- and it is of the utmost importance that guests follow their guide's instructions when in polar bear areas. (Additional information can be found in Section 15.e. Physical Disturbance.)
- Other species, besides polar bears, may pose a risk to human safety while participating in the planned activities including grizzly bears, wolves, muskox, walrus, fox and wolverine. These species represent a risk to people while conducting on the land activities. Guests will be informed of the risks that these species present, in addition to that of polar bears prior to landings ashore, in the onboard briefings by the Expedition Leader.
- Wildlife will not be harassed. This includes persistently worrying or chasing animals, or disturbing large groups of animals. Hunting is prohibited. Sport fishing is prohibited without a sport fishing license. AECO (www.aeco.no) provides detailed guidance for Members on operating around wildlife: <https://www.aeco.no/wildlife-guidelines/>. These guidelines will be followed in most instances, except that for Polar Bears, Government Nunavut guidelines will be followed (as the distances are more restrictive).
- Hurtigruten has also prepared company-specific standard operating procedures for polar bears and other bears to provide guidance to expedition staff members who will be serving as guides in the field. The manual is available upon request. Again, Government Nunavut guidelines will prevail in the Canadian Arctic where the GN guidelines are more restrictive.

Polar bears are a designated species of special concern under the Federal *Species at Risk Act* (<http://laws-lois.justice.gc.ca/eng/acts/s-15.3/>). Not only are polar bears an important component of Arctic marine and terrestrial ecosystems but they are also of commercial and cultural importance to the Inuit. They can also pose a safety risk to humans. All locations in Nunavut, apart from community visits, including for natural, historic and archaeological expedition landings, have high potential for interactions with polar bears during the ice-free summer months when bears are forced on land and are in a fasting state because their prey are generally not very accessible. During this time, it is essential that the bears be disturbed as little as possible. Stress resulting from disturbance by human activities will increase the bear's energy requirements and potentially affect bear health and survivorship. Swimming bears are vulnerable as they cannot escape or defend themselves and will be stressed by boats. Females with cubs are especially vulnerable.

In addition to the above, Section 15.e. also discusses minimization and mitigation measures to avoid impact to wildlife.

7.q. Special clothing and equipment

Guests have been advised in pre-tour documentation that they will need to be properly outfitted for Arctic conditions with appropriate heavy, cold-weather clothing and expedition gear, including waterproof boots for the shore landings. Hurtigruten is providing each guest with a complimentary cold-weather wind- and water-resistant jacket. Additionally, each guest has been provided with a Packing Checklist of recommended gear along with advice in this regard. Guests will be reminded

of the appropriate dress in onboard briefings and in the Daily Program, and in other written materials prior to expedition activities.

7.r. Traditional Knowledge - Inuit Qaujimajatuqangit

Inuit cultural beliefs and values are recognized and respected. Local residents will be engaged with regarding planned activities in the area when activities occur in inhabited areas and the Expedition Leader will solicit available Inuit Qaujimajatuqangit* to seek information about indigenous knowledge and guiding principles, as well as information about current recreational and traditional usage of the project area, which may inform project activities.

*Reference: "[Inuit Qaujimajatuqangit: The Role of Indigenous Knowledge in Supporting Wellness in Inuit Communities in Nunavut.](http://www.nccah-cnsa.ca/docs/fact%20sheets/child%20and%20youth/Inuit%20IQ%20EN%20web.pdf)" National Collaborating Centre for Aboriginal Health. 2009-2010. <http://www.nccah-cnsa.ca/docs/fact%20sheets/child%20and%20youth/Inuit%20IQ%20EN%20web.pdf>

It is understood that the following are guiding Inuit Qaujimajatuqangit Principles**:

1. Respecting others, relationships and caring for people.
2. Fostering good spirit by being open, welcoming and inclusive.
3. Serving and providing for family and/or community.
4. Decision making through discussion and consensus.
5. Development of skills through observation, mentoring, practice and effort.
6. Working together for a common cause.
7. Being innovative and resourceful.
8. Respect and care for the land, animals and the environment.

**Reference: <http://www.nirb.ca/inuit-qaujimajatuqangit>

To assist further in this regard, two elders from Cambridge Bay are being added to the Expedition Team as Cultural Interpreters (guest lecturers and staff members). One will join each voyage, for the leg from Pond Inlet to Cambridge Bay (or reverse). (Details as to the participants have been provided elsewhere.)

As noted in Section 5, community visits are planned, and on-going consultations are taking place for the Company's planned visits in Nunavut. Hurtigruten has solicited direct engagement with local residents through communication with the hamlet communities and with the local agents arranging services in advance and will continue to look for ways to encourage a dialog with potentially interested groups and individuals prior to undertaking project activities. The hiring will include local people in support of organized activities in the communities to be visited. In addition, arrangements have been made for carvings and other artifacts and handicrafts to be available for guests to purchase during community visits.

7.s. Giving Back to the Communities:

Cruise ship visits stimulate Nunavut's tourism economy as well as benefit the local economies. Positive impacts to local economies through community donations and the purchasing of services and artistic goods during community visits will ensure beneficial visits for all parties.

Hurtigruten has demonstrated a clear desire to commit funds to ensure that the local residents benefit from these proposed visits and that community economic benefits are realized. We know that all too often, ship guests spend the day in communities but leave very little financial impact. We are determined to ensure that doesn't happen. To that end, the company has agreed to actively promote the visits to guests ahead of arrival and encourage guests to purchase artifacts and handicrafts when in the communities. Where possible, guides and tour services will be pre-arranged to benefit as many as possible with organized shore excursions, cultural performances, tours, guiding and other tourism-related services. This are being arranged based on collaborative engagement with the communities.

Groups taken ashore during organized community visits will be small in size and rotated during the visit so as not to overwhelm the hamlet communities and to minimize strain on local infrastructure and service/goods providers. Groups will be escorted by members of the Expedition Team, in conjunction with personnel from the hamlet communities, with services arranged by our appointed Passenger Service Agents (ref. Section 7.1.).

8. Operator's Commitments

Hurtigruten has a long tradition of operating in both environmentally sensitive areas and in waters in which ice conditions exist. Operations have consistently demonstrated the Company's commitment to strictly observing stringent standards and requirements for protection of the environment.

With their extensive field experience in conducting expedition operations, standard operating procedures and guidelines have been developed and operational plans set in place to ensure that shore activities from the planned development result in impacts that are not more than minor or transitory in nature. This includes practices such as Biosecurity protocols; standard operating procedures for landings at wilderness sites; strict guide-to-guest ratios when making expedition landings; voluntarily restricting numbers ashore to small groups at wilderness, historical and archaeological sites; establishing procedures so that no trace of the visits are left behind and ensuring that nothing will be taken ashore apart from emergency supplies and that nothing will be left behind. Other measures include onboard briefings; printed materials provided in advance to brief guests so they are dressed appropriately and know how to behave ashore; ensuring groups are escorted by a highly qualified team of field personnel; hiring adequate staff in order that guests are guided in small groups; providing polar bear and bear safety in bear areas and obtaining permits, licenses and authorizations in advance.

On the technical side of the operation, Hurtigruten has carefully considered the operation from all perspectives. Based on experience in-house, the operator has employed a vessel with the latest environmental practices and suitable technologies to carry out the field operations. Operations will be in accordance with applicable Canadian legislation.

As noted in Section 7.r., consideration has also been given to *Inuit Qaujimagatuqangit*. This includes consideration of the voyage planning from the perspective of the Indigenous people in order that activities do not interfere with Inuit wildlife harvesting or traditional land use activities.

Hurtigruten's special operations staff, at all levels, have extensive background and experience in applying specific measures to avoid negative environmental impacts. Highly experienced personnel are also in place aboard the vessel to fully support the planned operation.

For over 125 years since the company was founded, Hurtigruten's original goals of excellence have never been compromised and the company continuously looks for ways to improve and refine its product, both on board and in terms of destinations. A keen sense of never resting on accolades and laurels is an important element of the Company's philosophy, as is its commitment to delivering the finest experience in the expedition cruise industry. Testimony to this are the following recent awards the Company has received:

2017 US - Travvy (travAlliancemedi) - Best Cruise Line, Expeditions and Adventure
2017 UK - The UK Cruise Critic -Best Cruise Line for Adventure
2017 Norway - Grand Travel Award – Best Shipping Company in Norway
2016 Travvy Award (travAlliancemedi) – Gold Award for Best Polar Expedition Operator
2016 USA Today 10 Best Reader's Choice – Best Boutique Cruise Line
2016 TravelAge West - Best Expedition Cruise Line (Western Agents' Vote of Excellence)
2016 WAVE Award – Best Expedition Cruise Line

Hurtigruten's record demonstrates that it has the business management qualifications and experience to manage and operate a cruise ship business and to provide visitors to all destinations with a unique educational and vacation experience, consistent with what they believe should be made available to their guests.

9. Technology

Details have been provided in Section 7.f. (List of Equipment to be Used).

10. Alternatives

Five alternatives have been considered, including:

- 1) Changes to itinerary,
- 2) Changes to number of guests,
- 3) Changes to vessel and auxiliary craft used,
- 4) Changes to activities,
- 5) Not proceeding with the cruise program.

Alternative 1: Changes to itinerary

Other sites could certainly be selected however there is perceived to be no benefit in doing so since these are not community visits.

Under these circumstances a change in the itinerary is therefore not considered necessary to minimize potential environmental impact.

Alternative 2: Changes to number of guests

A reduction in the total number of guests might reduce the absolute level of any impact, however, against this are weighed the factors of acceptable cost for guests and financial return for Hurtigruten, as well as the carrying capacity of the vessel.

During summer 2016 and 2017 one passenger vessel, MS CRYSTAL SERENITY, (operated by Crystal Cruises LLC) carried upwards of 1040 guests and conducted landings in Nunavut. MS FRAM is a small expedition cruise ship. Carrying a maximum of 318 guests (although only 240 are anticipated) and 80 crew per voyage, her small size enables her to meet the aim of not compromising environmental concerns. The Company believes she is therefore an appropriate vessel for this type of operation.

Limiting to small groups ashore for the expedition landings provides a strong management tool to minimize and mitigate impact.

Crew numbers ashore will be limited. Crew will only be allowed ashore for leisure purposes during on the expedition landings if they are required to assist the expedition team with the operations. Crew will be briefed; same as guests, and the Expedition Leader and the expedition team will also closely monitor their activities.

Under these circumstances a change in overall passenger numbers is therefore not considered necessary to minimize potential environmental impact.

Alternative 3: Changes to vessel and auxiliary craft used

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MS FRAM is a modern ocean-going vessel with the appropriate technology, and experience amongst her officers and crew.

In addition to the onboard team, Hurtigruten's shore-side staff and shipboard personnel are comprised of highly-qualified individuals with extensive experience in the maritime industry operating in some of the most environmentally-sensitive waters around the world.

The vessel professionally managed to meet and exceed Canadian and international shipping standards and is evaluated by an aggressive and comprehensive annual audit program that reflects and has previous experience in areas where ice is present. All current and relevant certificates are in hand and the vessel is maintained by suitably-qualified engineers and mechanics to meet requirements under the vessel's classification society.

A different vessel could be utilized but this could result in a vessel that is less suited and could result in a Master, bridge officers and/or crew with less suitable experience.

Due to the limited numbers of equally-suitable vessels, and contractual obligations, it is not feasible to make a change in vessel as decisions such as these require lengthy advance planning and cannot be made quickly or immediately. Considering the commercial/economic case for the proposed activity, there is no rationale for considering an alternative vessel.

There are alternative motorized craft that could be utilized for auxiliary boat operations; however, there would be no differences in the potential impacts resulting from this change. Polarcircle-brand boats outfitted with outboard engines have been standard equipment for many years of expedition tourist operations, including in Polar Regions, and have proven to be a safe and reliable means of transportation. Therefore, there is no basis for making any changes.

The alternative of not using sea kayaks also has no environmental or safety benefit should this activity not occur. These craft are an appropriate means of transportation for leisure activities; many expedition cruise operators have utilized kayaks for a number of years and the expedition team routinely offers kayaking aboard many other vessels around the world. The appropriate kind of kayaks have been selected for this particular activity and procedures are in place for a safe operation, along with qualified polar-experienced Kayak Instructors and support staff who will be overseeing the activity. Therefore, there is no basis for making any changes.

Alternative 4 - Changes to Activities

The activities being offered are not new and have been offered in the Arctic (and elsewhere in the world) by a number of expedition cruise operators for many years now. Hurtigruten has established activities that are within their capabilities and plans to carry out the activities with specially selected personnel who have the appropriate experience to ensure the activities can be carried out safely, in an environmentally responsible manner, to Canadian legislation, to AECO standards, to the Company's expectations and with equipment suitable for the activity and area of operation. Many expedition team members have worked for Hurtigruten or other expedition cruise operators conducting the same activities in the Arctic and Antarctic and bring with them this additional experience.

Activities will be carried out with the appropriate supervision, with experienced personnel and with standard operational procedures and safety measures in place. These activities have been designed so as not to result in any risk to participants and in a manner in that they will not have a more than a minor or transitory environmental impact. Therefore, there is no basis for making any changes.

Alternative 5 - Alternative of Not Proceeding with the Planned Cruise Program

The alternative of not proceeding with the cruise program is the only alternative that could remove all potential risks of environmental impact. Considering that there is local, national and international acceptance as to the legitimacy and benefits of the planned activity, provided that reasonable environmental standards have been considered and assessed to minimize any objective environmental risk, this alternative does not appear to be justified.

The activity as proposed will be carried out in accordance with Canadian legislation, applicable AECO guidelines and Company-specific standard operating procedures as well as advice received from the Nunavut Planning Committee, members of the Nunavut Impact Review Board and from community input. Taken together, these measures will provide the basis for ensuring that impacts from the activity, if any, will be no more than minor or transitory.

Any decision to cancel the planned cruise for anything less than the most compelling environmental reason would be contrary to the Company's purpose, which is to operate expedition cruises on a worldwide basis, including its planned voyage to Nunavut.

11. Traditional and Other Land Uses / Potentially Affected Communities

The area of operation has been identified in Section 7.b. Project Location.

It is noted that subsistence hunting, fishing, and trapping continue to be valued activities and that there are Territorial *Species at Risk* within Nunavut.

The community visits of MS FRAM are being planned in consultation with the Economic Development Officers so there should be no interference or jeopardy to the aims of any community conservation plans nor any known land uses for the hamlets and/or municipalities.

12. Community, Co-Management, Inuit Organizations and Government Engagement and Consultation

Notification of the vessel's itinerary has been distributed to, or will be distributed, during the Review Board processes by the following government departments and organizations:

- Canada Border Services Agency
- Transport Canada
- Canadian Wildlife Service
- Canadian Coast Guard
- Shipping Federation of Canada
- Department of Fisheries and Oceans
- Citizenship and Immigration Canada
- Government of Nunavut
 - Department of Economic Development & Transportation (Cruise Nunavut)
 - Department of Culture & Heritage
 - Department of Environment
- Nunavut Planning Commission
- Nunavut Impact Review Board
- Nunavut Tourism
- Inuit Heritage Trust
- Qikiqtani Inuit Association
- Kitikmeot Inuit Association

Community visits are planned and it is understood that community consultation, by way of the NIRB public review process, will avoid potential negative impacts to public and traditional land use activities along the proposed travel route, particularly in areas adjacent to the sites to be

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visited, from vessel and tourism activities since it is likely that the terrestrial and marine areas near these communities would be used for traditional activities and noise from vessel and auxiliary boat operations may temporarily change distribution of harvested species through avoidance and may affect personal enjoyment of the land and marine areas. Community consultation is desired to ensure that the project does not interfere with Inuit wildlife harvesting or traditional land use activities in the project area. Community SAOs will be contacted well in advance of the 2018 summer season with details provided in the Project Description and by letters of introduction sent under separate cover.

13. Analysis of Potential Significant Negative Environmental Impacts

The proposed area of operation has been stated in Section 7.b.

MS FRAM will be transiting through offshore/marine environments with wildlife habitats featuring a range of wildlife, including Species at Risk in Nunavut:

http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm

A list of wildlife species anticipated to be encountered has been included in Section 15.e.

The Expedition Leader will inform all who are going ashore of any designated Species at Risk in the areas to be visited.

SARA species most likely to be encountered include Atlantic Walrus (Special Concern – pending), Beluga Whale (Special Concern – pending), Bowhead Whale (Threatened/Special Concern – Pending), Grey Whale (Special Concern), Polar Bear (Special Concern), Killer Whale (Special Concern – Pending) and Narwhal (Special Concern - Pending).

Other SARA species at risk that could be encountered include: Eskimo Curlew, Ivory Gull, Ross's Gull, Harlequin Duck, Rusty Blackbird, Felt-leaf Willow, Peregrine Falcon, Short-eared Owl, Peary Caribou, Barren-ground Caribou, Red knot, Porsild's Bryum, Horned Grebe, Grizzly Bear and Wolverine.

Hurtigruten is aware of the *Nunavut Species at Risk Act*:

<ftp://ftp.nirb.ca/01-SCREENINGS/COMPLETED%20SCREENINGS/2013/09DN018-DND-Nanisivik%20Naval%20Facility/04-AUTHORIZATION/141201-09DN018-SARA-IA1E.pdf>

During expedition landings, guests, the expedition team, and crew assisting will be landing ashore in areas where wildlife and delicate tundra flora and vegetation may be encountered. The proposed activity could be indirectly disruptive to certain animal and plant species.

Historically- and culturally-significant sites will be visited with a Class 1 Archaeological Permit being requested through Government of Nunavut's Department of Culture and Heritage. Management protocols are in place to protect the sites during organized landing activities. Details have been included in Section 7.m.

Section 14 includes the cumulative environmental impacts anticipated; Section 15 an assessment of the proposed activity, including the minimization and mitigation of likely environmental impacts.

As "The Northwest Passage – In the Wake of Great Explorers 2018 – Westbound and Eastbound" project is a proposed cruise tourism project, the nature of potential impacts is considered to be well-known, with potential for infrequent, localized impacts to the biophysical environment that are temporary in nature, reversible and mitigable with due care.

14. Cumulative Environmental Impacts

Cumulative impact can be defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions."¹

¹ Council on Environmental Quality. 1997. Considering Cumulative Effects under the National Environmental Policy Act. Washington, USA.

Examples of cumulative impacts to which the proposed activity may contribute include:

- Effect on tundra vegetation or periglacial features through additive effects of pedestrian traffic,
- Increased pedestrian traffic,
- Disturbance of migratory and/or At Risk species,
- Degradation of cultural and historic artifacts from handling, abrasion, theft, etc.,
- Changes in attitudes over time and hence acceptable uses of localities through familiarity and precedent,
- Effects to marine and terrestrial wildlife and historical sites.

Hurtigruten has planned the proposed project to visit expedition landing sites that are in close proximity of those being visited by other expedition cruise operators; however, limited baseline environmental monitoring data exists for the sites that will be visited by MS FRAM, so it is difficult to judge the likely long-term cumulative effects of the visitation. As stated previously, the activity as planned has been designed to have a less than minor or transitory environmental impact.

15. Likely Environmental Impacts: Assessment, Minimization and Mitigation of Proposed Activities

Potential negative impacts can be mitigated by adhering to the following Acts and Regulations, which must be observed by tourism operators conducting activities in the Canadian Arctic:

- *Aeronautics Act* (<http://laws-lois.justice.gc.ca/eng/acts/A-2/>)
- Anchorage Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-88-101/index.html>)
- *Arctic Waters Pollution Prevention Act* (<http://laws-lois.justice.gc.ca/eng/acts/A-12/>)
- Arctic Waters Pollution Prevention Regulations (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._354/index.html)
- Arctic Shipping Pollution Prevention Regulations (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._353/index.html)
- Ballast Water Control and Management Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-237/index.html>)
- *Canadian Environmental Protection Act* (<http://laws-lois.justice.gc.ca/eng/acts/C-15.31/>)
- *Canada National Parks Act* <<http://laws-lois.justice.gc.ca/eng/acts/n-14.0>>
- *Canada Shipping Act, 2001* (<http://laws-lois.justice.gc.ca/eng/acts/C-10.15/>)
- Canada Wildlife Act, (<http://laws-lois.justice.gc.ca/eng/acts/w-9/index.html>)
- Charts and Nautical Publications Regulations, 1995 (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-95-149/index.html>)
- Coasting Trade Act (<https://www.tc.gc.ca/eng/acts-regulations/acts-1992c31.htm>)
- Collision Regulations (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1416/index.html)
- Environment and Climate Change Canada National Guidelines to minimize marine vessel-based disturbance to wildlife (www.ec.gc.ca)
- *Fisheries Act* (<http://laws-lois.justice.gc.ca/eng/acts/f-14/>)
- Life Saving Equipment Regulations (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1436/index.html)
- *Marine Liability Act* (<http://laws-lois.justice.gc.ca/eng/acts/M-0.7/>)
- Marine Liability Act Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2002-307/>)
- Marine Mammal Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-56/index.html>)
- Marine Personnel Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-115/index.html>)

- *Marine Transportation Security Act* (<http://laws-lois.justice.gc.ca/eng/acts/M-0.8/>)
- Marine Transportation Security Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2004-144/index.html>)
- *Migratory Birds Convention Act* (<http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>)
- *Migratory Birds Regulations* (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1035/)
- National Parks of Canada Fishing Regulations (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1120/index.html)
- Navigation Safety Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2005-134/index.html>)
- Northern Canada Vessel Traffic Services Zone Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-127/page-1.html#h-1>)
- *Nunavut Act* (<http://laws-lois.justice.gc.ca/eng/acts/N-28.6/>)
- Oceans Act (<http://laws-lois.justice.gc.ca/eng/acts/o-2.4/>)
- Shipping Safety Control Zone Orders (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._356/index.html)
- Small Vessel Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-91/index.html>)
- *Species at Risk Act* (<http://laws-lois.justice.gc.ca/eng/acts/s-15.3/>) [Appendix A is a list of Species at Risk in Nunavut]
- Steering Appliances and Equipment Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-83-810/page-1.html#h-2>)
- *Transportation of Dangerous Goods Act, 1992* (<https://www.tc.gc.ca/eng/tdg/act-amendedact-69.htm>)
- Transportation of Dangerous Goods Regulations (<https://www.tc.gc.ca/eng/tdg/safety-menu.htm>)
- Vessel Certificates Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-31/index.html>)
- Vessel Clearance Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-125/index.html>)
- Voyage Data Recorder Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-203/index.html>)
- Wild Animal and Plant Protection Regulation of International and Interprovincial Trade Act (<http://lois-laws.justice.gc.ca/eng/acts/W-8.5/index.html>)
- Wild Animal and Plant Trade Regulations (WAPTR) (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-263/>)
- *Wildlife Act* (<http://laws-lois.justice.gc.ca/eng/acts/W-9/>)
- Wildlife Area Regulations (http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1609/)

Additional information can be found in the **Addendum** to this submission.

15.a. Emissions to Air

Origins:

Emissions to air generated by fuel burned during the proposed activity will originate from:

- Ship cruising, and
- Small auxiliary boats.

In addition, fueling activities or fuel spills could result in a small amount of fugitive emissions to be released. The incineration of waste will also result in emissions. These emissions contribute both directly and indirectly to the greenhouse effect and to local and regional air pollution.

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There is potential for impacts in the region to be visited. The probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence due to the intermittent nature of the proposed tourism activity and reversible in nature.

Assessment:

Emissions resulting from marine combustion are typically close to the source and well away from land. This is usually an environment where wind is a common feature. Emissions will generally be rapidly dispersed by wind, however any activity producing atmospheric emissions will contribute to regional and global air pollution burdens.

Minimization and Mitigation:

Careful, thorough and routine maintenance is the primary method for minimizing emissions of carbon oxides, unburned hydrocarbon and black smoke. Partial mitigation is possible through the use of 'clean' fuels and lubricants, and regular care and maintenance of engines. Hurtigruten is continually investigating new technologies and methods to increase the level of safety associated with its operations.

Hurtigruten has reviewed Environment and Climate Change Canada's "Technical Document for Batch Waste Incineration" (<http://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=F53EDE13-1>), which provides information on appropriate incineration technologies, best management and operational practices, monitoring and reporting.

All combustible wastes will be incinerated daily, or as per Canadian legislation, with the ash removed from incineration activities and non-combustible wastes from the vessel to an approved facility for disposal. The incineration of combustible wastes will comply with the *Canada-Wide Standards for Dioxins and Furans* (http://www.ccme.ca/files/Resources/air/dioxins_furans/waste_incinerators_coastal_pulp/d_and_f_standard_e.pdf) and the *Canada-Wide Standards for Mercury* (http://www.ccme.ca/files/Resources/air/mercury/mercury_emis_std_e1.pdf). Measures will be taken so that no waste oil/grease will be incinerated onboard MS FRAM.

15.b. Emissions to Water – Fuel and Oil Spills

Origins:

Emissions to water will originate from:

- Ship cruising, and
- Small auxiliary boats.

There is potential for impacts to marine and coastal areas in the region to be visited. The probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence due to the intermittent nature of the proposed tourism activity and reversible in nature.

Maintenance and fueling of auxiliary boats and by leakage from fuel containers may result in fuel and oil spills. A catastrophic loss from a vessel may result in an emergency fuel jettison however this is an unlikely scenario.

Standard operating procedure calls for refueling of the auxiliary craft to be done aboard MS FRAM and not in the auxiliary boats (e.g. on the water).

Local and regional contamination of the marine and coastal environments and their dependent ecosystems could result as a direct effect of any spill.

Assessment:

Fuel spills are most likely to occur due to fueling of the gasoline tanks for the auxiliary boats. Should a spill occur aboard the vessel, it is estimated a spill would be <10 liters.

MS FRAM will follow the route selected by the vessel's Master. Because of this, the likelihood of a catastrophic puncture of a fuel tank with a loss of 1000 liters or more of fuel is extremely low.

Fuel spills rapidly evaporate however the rate of evaporation depends upon the conditions (e.g. polar or tropical), for example since at low temperatures evaporation is less complete.² In addition, as a number of hydrocarbons are highly soluble in water, their effect depends upon dilution.³

Minimization and Mitigation:

Fuel spills constitute the most unpredictable accident aboard ship; however, occurrence can be minimized through strict adherence to sound operating procedures, including a Spill Prevention Plan and employing operational measures throughout project operations.

Provided spill procedures are followed according to established operating procedures, spills occurring on the ship during fueling operations will be contained. The resultant spill from three fully-loaded tanks of fuel (116 liters each) in an inflatable boat during a catastrophic event could be in the order of 348 liters however this would be an extremely rare occurrence.

For fuels and chemical storage: Drip pans or other equivalent device shall be used when refueling equipment. In addition, secondary containment or a surface liner (e.g., self-supporting installments and fold-a-tanks) shall be used at refueling stations. Appropriate spill response equipment and clean-up materials (e.g., shovels, pumps, barrels, drip pans, and absorbents) will be readily available during any transfer of fuel or hazardous substances at all fuel storage sites and maintenance areas. Additionally, all personnel will be properly trained in fuel and hazardous waste handling procedures, as well as spill response procedures. All spills of fuel or other deleterious materials of any amount will be reported to the 24-hour Spill Line at (867) 920-8130.

The most effective methods for minimization and mitigation are having a dedicated emergency contingency plan, ensuring strict adherence to established operating procedures, having an oil spill kit on board, effective containment procedures, spill contingency planning, and effective communications. Spill prevention procedures include, but are not limited to, following established fuel bunkering procedures during bunkering operations, the use of funnels, spill mats during fueling and engine maintenance, use of drip trays; and utilizing absorbents.

15.c. Wastes Generated During the Expedition

Origins:

Wastes will or could originate from:

- Ships, and
- Small auxiliary boats

The proposed activity will result in wastes being generated during the course of normal ship operation.

² OSRL. 1998. Antarctic oil pollution course: 20-12 August 1998. Southampton, Oil Spill Response Ltd [published course handbook].

³ Cripps, G.S. and J. Shears. 1997. The fate in the marine environment of a minor diesel fuel from an Antarctic research station. *Environmental Monitoring and Assessment*, 46, 221-232.

There is potential for impacts to marine and coastal areas in the region to be visited. The probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence due to the intermittent nature of the proposed tourism activity and reversible in nature.

Assessment:

Waste materials from ship operations include refuse, waste fluids from mechanics and sewage waste. Burnable wastes will be incinerated if required; with the resultant incinerator ash disposed of in an appropriate manner.

Relevant disposal routes are shown below.

Types of waste generated and proposed disposal routes:

<i>Waste Type</i>	<i>Route</i>
Non-hazardous	
Paper, plastics, timber	Separated and incinerated or removed for recycling and disposal. No plastic is incinerated.
Metal, glass	Separated or removed for recycling and disposal
Incinerator ash	Disposed of as per Canadian legislation
Biodegradable	
Food waste	Food will be segregated and refrigerated for disposal at certified reception port or grained and disposed according to MARPOL regulations
Human waste	Treated on board and disposed as per Canadian legislation
Gray water	To be disposed as per Canadian legislation
Hazardous	
Batteries	Separated and removed for recycling or disposal at certified reception port
Medical and sanitary waste	Frozen and removed for disposal at certified reception port
Fuels and oils	Removed for disposal at certified reception port

MS FRAM has TBT-FREE SPC anti-fouling paint on its hull. Organotin biocides are not contained in the particular brand of anti-fouling paints thereby complying with the IMO Antifouling Systems Convention (AFS/CONF/26).

Ballast exchange will be in accordance with Ballast Water Control and Management Regulations [<https://www.tc.gc.ca/eng/marinesafety/tp-tp13617-menu-2138.htm>] and the voluntary Ballast Water Exchange Guidelines [<https://www.tc.gc.ca/eng/marinesafety/tp-tp13617-schedule2-999.htm#c37c>].

Minimization and Mitigation:

All waste will be disposed of according to the procedures previously stated. Waste release incidents will be avoided according to adherence with standard operating procedures. The vessel will not deposit, nor permit the deposit of any fuel, chemicals, wastes (including waste water) or sediment into any marine waters and shall manage wastes on board the vessel prior to final disposal at approved port facilities.

Appropriate protocols are in place to minimize accidental releases or discharges that do occur and mitigated by clean-up efforts. Natural dispersion – through wave and wind action – will also assist with clean-up efforts should a waste release incident occur. Therefore, accidental

discharge of these waste products into the environment will have no more than minor or transitory impacts.

While unlikely, the potential of an accidental discharge of fuel and waste products from a marine collision or other event does exist. Impacts to the environment from such events could include the accidental discharge of refuse or accidental release of petroleum fuel, in addition to small quantities of lubricating fluids, oils, and diesel fuel for the auxiliary boats.

For the auxiliary boat operations, standard operating procedures dictate that waste products, if any (for example as a result of an unexpected stranding ashore), are to be contained on board the auxiliary boats – not only while underway, but also when ashore. Any waste products and refuse will be returned to the ship for disposal in accordance with discharge parameters in accordance with Canadian legislation. Waste mechanical fluids will not be disposed of while the auxiliary boats are being utilized for landings or excursion purposes.

Emergency food rations are contained in the Emergency Shore Kit to be used in the event that a stranding occurs on shore. Should these rations be used, any garbage resulting will be collected using garbage/waste bags and returned to the ship for proper disposal. Any refuse will be returned to MS FRAM for disposal in accordance with discharge parameters as required by Canadian legislation.

15.d. Noise

Origins:

Noise will be generated by:

- Ship operations, and
- Small auxiliary boat operations

There is potential for impacts to marine and wildlife in the region to be visited. The probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence due to the intermittent nature of the proposed tourism activity and reversible in nature.

Assessment:

Effect of noise upon wildlife and wilderness and aesthetic values is a key concern. Wildlife can be impacted by noise in two ways: 1) increased stress leading to changes in an individual's behavior and 2) disturbance of whole communities leading to breeding mortality. Species that could be disturbed include whales, seals, walrus, polar bear, seabirds and birds, including Species at Risk in Nunavut with disturbance occurring on shore at the colony, nest or haul-out site during breeding, where impact could be the greatest. Other effects of noise can impact species that are resting; in cases such as this, the impact is likely to be less significant.

The level of noise disturbance is related to the number of auxiliary boats used, their movements, speeds, and whether or not the equipment is maintained in optimal conditions. Noise is caused by a combination of engine operation and engine speeds. Defective exhaust systems or other faulty equipment can also result in greater noise.

Minimization and Mitigation:

Impacts of noise effect from vessels and small auxiliary boats have been poorly studied. To minimize and mitigate impact, activities will be managed in accordance with:

- Environment Canada's Guidelines to Avoid Disturbance to Seabird and Waterbird Colonies in Canada (<https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=E3167D46-1>)

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- AECO Guidelines for Expedition Cruise Operations in the Arctic (<http://www.aeco.no/guidelines/operational-guidelines/>)
- AECO Guidelines for Visitors to the Arctic (<http://www.aeco.no/guidelines/visitor-guidelines/>)
- Government Nunavut “Operator Code of Conduct” (available from Cruise Nunavut)

Diesel engines will be used on the auxiliary boats to minimize noise and emissions. Drivers are experienced in operating craft around wildlife and will ensure that boat operations are conducted in a way that minimizes disturbance to any wildlife encountered.

15.e. Physical Disturbance

Origins:

Physical disturbance may result from the following activities:

- Vessel operations,
- Small auxiliary boat operations, and
- Shore landings

There is potential for impacts to marine and terrestrial wildlife, and the terrestrial environment, including sites of cultural, historical, paleontological and geological importance, in the southeast Baffin Island region. The probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence due to the intermittent nature of the proposed tourism activity and reversible in nature.

Assessment:

Likely physical disturbance from MS FRAM and related small auxiliary boat operations includes activities such as water turbulence from vessel passage, the breaking of sea ice, damage to sea floor, deep-water corals and benthic communities from anchoring, and effect on wilderness and aesthetic values. The itinerary design will likely result in the vessel not being at anchor for more than one to two days and in regularly used anchorages.

The ship will stop sufficiently far from any wildlife colonies or open water access area in order that its physical presence should have no effect or impact on their behavior. A transitory effect on the wilderness and aesthetic values of the area will therefore result from the vessel’s presence.

The geographic area includes marine and coastal areas. The proposed project would also take place within habitats for various marine wildlife including fish populations, benthic invertebrates, and marine mammals, including Species at Risk. Additionally, land-based activities may also take place within habitats for many far-ranging wildlife species such as caribou, muskox, wolves, polar bears, wolverine, grizzly bears, migratory birds, and Species at Risk. As such, project activities may potentially affect both marine and terrestrial animal migratory patterns.

The timing of the project activity and the specific region the Operator intends to traverse for tourism activities are known polar bear summer habitats. The area also has been identified as having value and priority to the local communities for:

- i. Marine mammals including various whale species, walrus and seals;
- ii. Shoreline ecosystems;
- iii. Fish species including arctic char;
- iv. Drinking water;
- v. Terrestrial wildlife including caribou, muskox, wolves and grizzly bears;
- vi. Migratory birds including duck species and geese; and
- vii. Polar bears.

The proposed project activity could also interact with historically and culturally significant areas for traditional activities, such as hunting and fishing, while touring areas adjacent to the communities to be visited.

Landing, shore operations can adversely impact flora and fauna – including native, rare and endangered (e.g. Species at Risk) wildlife and sites of historical, cultural, archaeological, paleontological and geological significance. Boat beaching, pedestrian traffic, and physical contact can also adversely impact land, air and water quality, and historic and geologic features. Notably landing and shore operations may adversely impact on polar bears, nesting birds, hauled out seals or walrus, and on the intertidal marine ecosystem. Habitat destruction may be impacted due to trampling of nesting sites and fragile tundra and/or plant communities, or impacts to wildlife, for example forced behavior modification, such as causing animals to scatter (and possibly abandoning their nests, possibly also leaving eggs and/or young susceptible to predation), or by restricting their movements. The introduction of alien species may also occur.

In some areas, soil erosion can result from pedestrian traffic as well as walking tracks from repeated passage. The natural processes of the environment can be disrupted or damaged by physical contact, either by small boats or kayak or by visitors traversing through a given area. The introduction of alien species can disrupt scientific studies or cause other harm from intrusions into protected areas.

Damage can occur if operations of the auxiliary boats and kayaks during the launching procedures are not conducted properly to avoid damage to the sea floor and other biota if touched. Damage can be significant and lead to local loss of fragile species. Impacts can contribute to degradation both biological and aesthetic.

Minimization and Mitigation:

Minimization and mitigation measures include education, which is viewed as being the key factor toward ensuring that crew, expedition staff and guests are educated and briefed appropriately. The Expedition Leader is responsible for ensuring that the appropriate briefings are provided to passengers and expedition staff and that the relevant training is provided to the vessel's crew. Briefings will include examples of non-interfering behavior, specific points regarding movement and behavior ashore at the various landing sites. Guests will be briefed on general interactions with wildlife including polar bears, other predators, and other Arctic species and the dangers they may pose. Guests and expedition team members will also be briefed on responsibilities and requirements regarding wildlife and wildlife habitat protection. This includes pre-landing briefings on wildlife sensitivities and potential hazards, proper wildlife viewing techniques and safety practices.

The Expedition Leader is responsible for managing activities off of the ship, including auxiliary boat and kayak operations, shore landings and specialty activities with the assistance of the expedition team. Activities ashore during the expedition landings will depend upon the highlights of each site but may include guided walks or hikes; or to view wildlife, flora and sites of unique geological interest.

Prior to disembarking guests for activities ashore, the Expedition Leader will assess the landing site with the specific purpose of evaluating the landing against safety and environmental conditions.

As the guests arrive to the landing sites the Expedition Leader and/or expedition staff will brief each boatload, emphasizing specific points of importance. In all briefings, conservation issues will be stressed. Printed materials and lectures before the first disembarkation serve to address the potential areas of adverse impact by assessing activities that may result in impacts before the first disembarkation.

Anchoring is prohibited within marine protected areas or marine reserves.

Ship's command and the Expedition Leader is also aware of *Species at Risk* to ensure that activities do not impact these species. Environment and Climate Change Canada's "Environment Assessment Best Practice Guide for Wildlife at Risk in Canada" (http://www.sararegistry.gc.ca/virtual_sara/files/policies/EA%20Best%20Practices%202004.pdf) provides information on what is required when Wildlife at Risk, including *Species at Risk*, are encountered or affected by the Project.

Information on Migratory Birds is known from the following documentation:

- Canadian Wildlife Services' "Key Migratory Bird Terrestrial Habitat Sites in the Northwest Territories and Nunavut" (<http://publications.gc.ca/site/eng/317630/publication.html>)
- Canadian Wildlife Services' "Key Marine Habitat Sites for Migratory Birds in Nunavut and the Northwest Territories" (<http://publications.gc.ca/site/eng/392824/publication.html>)

These guides provided information on key terrestrial and marine habitat areas that are essential to the welfare of various migratory bird species in Canada.

Environment and Climate Change Canada's "Incidental Take web page and the fact sheet "Avoidance of Detrimental Effects to Migratory Birds (Incidental Take)" (<http://www.ec.gc.ca/paom-itmb/>) provides information on how to protect migratory birds, their nests and eggs when planning or carrying out project activities.

To minimize wildlife interactions the following will be standard operating procedures:

- Any interactions with bears should be avoided if at all possible.
- Auxiliary craft should stay clear of any swimming polar bears and under no circumstances approach them. If swimming bears are encountered, the boats should stop, move away, and allow the swimming bear(s) to proceed in the direction of their choosing.
- Distances to polar bears will be as per the Government of Nunavut, Department of Environment recommendations below.
- All interactions with polar bears must be reported to the nearest Government of Nunavut, Department of Environment Conservation Officer as soon as possible.
- A Polar Bear Safety Plan must be in place to deal with potential interactions with polar bears during activities. The Company's plan is available upon request. (See also the additional information below.)
- While on cruise ship or auxiliary watercraft (Polarcircle boats or kayaks), viewing time of each concentration of marine mammals will be limited to a maximum of thirty (30) minutes in order to minimize disturbance.
- There will be no attempt to intersect or interfere with the movements of marine mammals by the vessel or auxiliary watercraft (Polarcircle boats or kayaks). Strategic positioning of vessels ahead of the path traveled by mobile whales and waiting for the whales is also prohibited.
- Visitation of cliffs used by nesting and breeding birds is restricted to Polarcircle boats and kayaks only, and then only during morning and early afternoon hours. Noise will be kept to a minimum when visiting these bird colonies.
- Activities will avoid the seaward site of seabird colonies and areas used by flocks of migrating waterfowl by three (3) kilometers.
- Activities that may interfere with the migration or calving of caribou or muskox will cease, until the caribou or muskox have passed or left the area.

The following recommendations from Government of Nunavut, Department of Environment, will also be followed as standard operating procedures:

- All provisions of the *Wildlife Act* (<http://laws-lois.justice.gc.ca/eng/acts/WV-9/>) and the associated regulations are to be followed at all times.

- Keep at least 100 metres away from bears and large mammals (both marine and terrestrial), 25 metres from small animals and nesting birds (-100 metres from fledgling raptors) (while on land or in small vessels). If viewing from the main vessel, try to keep 400m away.
 - Give wildlife plenty of space. Binoculars and spotting scopes allow wildlife viewing without getting too close. Approach animals slowly, quietly, and indirectly. Always give them an avenue for retreat, and never pursue an animal.
 - Avoid noises or actions that might stress wildlife or cause animals to waste energy in unnecessary flight.
- Do not approach young or baby animals.
- Avoid approaching animals that are breeding, nesting, brooding, denning or raising young without the accompaniment of your local guides.
- Be aware of how to recognize and respond to signs of alarms
 - These are sometimes subtle, and they vary between species, but may include increased movements such as agitated flapping or pacing, heightened muscle tension, staring, or frequent vocalization. If you sense that an animal is disturbed by your presence, back off. If it still does not resume its normal behaviors, leave it alone.

As identified in Section 7.o., the Company's Polar Bear Manual provides standard operating procedures for polar and grizzly bears. Bear deterrents for guides include 30.06 caliber Tikka-brand T3-model manual bolt rifles. Non-lethal deterrents including flare guns, air horns and noisemakers. These deterrents are part of the shore landing kit, which is taken ashore as part of the standard operating procedure when landing guests in wilderness areas. Lethal rounds will only be used in the defense of life or property. Any interactions with polar bears will be reported to the nearest Government of Nunavut, Department of Environment Conservation Officer as soon as possible.

A Wildlife Observation License from Government of Nunavut's Department of Environment will be obtained in advance of activities occurring for sightseeing activities and landings in wilderness areas with a report on wildlife sightings provided at the conclusion of the voyage.

In addition, the following provide advice on bear and carnivore safety:

Government of Nunavut's booklet on Bear Safety:

[http://gov.nu.ca/sites/default/files/bear_safety - reducing_bear-people_conflicts_in_nunavut.pdf](http://gov.nu.ca/sites/default/files/bear_safety_-_reducing_bear-people_conflicts_in_nunavut.pdf)

"Safety in Grizzly Bear and Black Bear Country" pamphlet:

http://www.enr.gov.nt.ca/sites/default/files/web_pdf_wd_bear_safety_brochure_1_may_2015.pdf

Bear Smart Society video:

<http://www.bearsmart.com/play/safety-in-polar-bear-country/>

Information on bear safety can be found on the Parks Canada website at:

<http://www.pc.gc.ca/eng/pn-np/nu/quttinirpaaq/visit/visit6/d.aspx>

Visits to sites of historical and archaeological significance are planned and a Class 1 Archaeological Permit is being sought from Government of Nunavut's Department of Culture & Heritage. It is understood, however, that all sites have cultural importance. A policy of 'take only photographs and leave with only with memories' policy will be in place.

Existing trails will be used, where possible, during project activities on land to minimize disturbance. Land use areas will be kept clean and tidy at all times, with any garbage collected and returned to the ship for proper disposal.

Should any guest violate the rules, the Expedition Leader and expedition staff supervising shore activities may remove the offending participant from the site and prohibit participation should he/she be concerned over the individual's future behavior. Experience has shown that in nearly all cases, guests are champions of the environment and overwhelmingly support measures to minimize adverse environmental impact.

The Company will seek information about traditional knowledge and guiding principles, as well as information about current recreational and traditional usage of the project area to inform future planning. Hurtigruten will solicit direct engagement with local residents through communication with the hamlet communities and with the local agents arranging services in advance and will continue to look for ways to encourage a dialog with potentially interested groups and individuals prior to undertaking future project activities.

15.f. Introduction of Alien Species and Translocation of Diseases

Origins:

The risk of introduction of non-native alien species (those species that do not naturally occur in an area and have been introduced intentionally or unintentionally) and translocation of external diseases is ever-present due to direct and rapid inter-continental transfers. Introduced species include microbes, algae, fungi, vascular plants, invertebrates, fish, birds and mammals. Introduction could occur through a number of pathways, including packaging, contaminated clothing or equipment, and even importing uncooked food.

There is potential for impacts to the terrestrial environment, including sites of cultural, historical, paleontological and geological importance, in the southeast Baffin Island region. The probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence due to the intermittent nature of the proposed tourism activity and reversible in nature.

Assessment:

Human activities have the potential to act as a vector for non-native species. Populations are susceptible to infection by disease and scavenging of unsecured food waste by birds, for example, is a simple route for these to enter the system. The possibility exists for the spread of diseases from one colony to another should disruption occur. The local biota could be significantly impacted should introduction or translocation of alien species, soils or microbes occur. In some areas, impacts may extend to rare and/or endangered species. Unclean footwear, clothing or equipment and on small boats, can introduce soil and seeds which may result in the accidental transfer of non-native organisms.

Minimization and Mitigation:

Standard operating procedures such as boot, clothing and equipment decontamination for small auxiliary boat operations and shore landings will be followed strictly to ensure the prevention of introduction of translocation of non-native species and disease.

MS FRAM will apply the following practices to minimize the likelihood of introduction of alien species or diseases:

For the vessel:

- Rat guards in place on mooring lines,
- Gang plank lifted at night or, if lowered, lit with flood lights,
- External doors and windows closed whenever possible,
- Proper food handling, secure storage and proper disposal of waste generated on board,
- Insect traps in place in food storage areas,

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- Old foods removed from food storage areas at the end of the voyage,
- Prohibiting the taking of uncooked poultry products or eggs ashore, and
- Ensuring that procedures are followed for boot, clothing, and equipment decontamination.
- Use of hand-washing stations with disinfecting solutions positioned throughout the vessel.

For the auxiliary watercraft (tenderboats and kayaks):

- Insides of watercraft cleaned,
- Hulls of watercraft cleaned before loading, and
- Cleaning of watercraft in between activities/landings and between areas of operation.

The Expedition Leader has responsibility for briefing all those going ashore on Biosecurity measures. Participants will be strongly encouraged to check and, if necessary, clean their clothing (including Velcro cuffs, pockets, seams, socks, trouser hems and cuff turn-ups, fleece, zippers, and/or hood of jackets) and equipment (including items such as camera tripods, trekking poles, daypacks, camera bags and rucksacks, etc.) prior to the shore landings. Those who may have recently gone trekking, tramping, backpacking, or farm visiting prior to the voyage will be advised they must check their items especially carefully to ensure they have removed all foreign material. Washing boots, walking sticks and camera tripods with a disinfectant (biocide) agent before and after each expedition site landing will reduce the likelihood of impacts from occurring.

15.g. Dependent and Associated Ecosystems

Origins:

Aspects of the proposed activity that are likely to affect dependent and associated ecosystems are:

- Emissions to air: contribution to regional and global air pollution burdens,
- Removal of wastes: increased landfill in port reception facilities; indirect effect of contamination of soil and groundwater and disease transfer during sewage handling, and
- Physical presence: disturbance of migratory species or dependent and associated ecosystems, and
- Potential negative impacts to soil quality and terrestrial ecosystem integrity from land-based tourism activities.

There is potential for impacts to shoreline and land-based tourism activity sites. The probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence due to the intermittent nature of the proposed tourism activity and reversible in nature.

Habitat disruption is a potential impact to marine animals that can result from the presence of auxiliary boats, kayaks, and auxiliary equipment. Potential impacts could include noise from the engines and activities, water turbulence resulting from the operation of the auxiliary boats, and pollution from exhaust and inadvertent engine discharges. Piloting the auxiliary boats with improper navigation and a high rate of speed could result in harmful interference of sea birds and marine animals in the water, in near shore environments or on ice floes.

Assessment:

Emissions from routine operations have the possibility to lead to impact from airborne pollution and contamination of soils, snow and/or ice with an indirect effect of pollution of local environments. The potential cumulative effect is a contribution to regional and global air pollution.

Routine operations involving domestic, food and/or hazardous waste (removed as required by Canadian legislation) can result in an increase in landfill (when offloaded) and an increase in

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engine emissions (when transporting waste to disposal sites) leading to an indirect impact by contamination of soil and groundwater; damage to local ecosystems and loss of habitat. The potential cumulative effect is a need for more landfill space at reception sites; loss of habitats; increasing soil and groundwater contamination; and an increasing contribution to regional air pollution.

Routine operations involving human waste (solid and liquid) have a direct effect of increasing sewage treatment at reception sites and an increase in engine emissions in the transportation of waste. The indirect effect is disease transfer during sewage handling; impact on human health at reception sites; contamination from the use of detergents during cleaning of containers and loading on surrounding ecosystems and habitats. The potential cumulative effect is an increased loading on the surrounding ecosystems and increased air pollution.

The physical disturbance from routine operations can lead to a loss of aesthetic or wilderness value and disturbance of wildlife leading to an indirect effect of an increase in the 'footprint.' The potential cumulative effect is a loss of tourism value.

Minimization and Mitigation:

MS FRAM will be used to carry out garbage so that no garbage is disposed of in Canadian waters, thereby complying with the 'zero discharge' provisions of the *Arctic Waters Pollution Prevention Act*.

Prevention (when possible), enforcement of strict operating procedures, limiting group sizes for land-based activities, proper supervision by experienced guides, utilizing existing trails where possible when conducting activities on land, ensuring land use areas are properly maintained, and enforcing Biosecurity measures are the primary means to avoid or minimize impact to the environment.

Measures to mitigate potential impacts also includes proper training and supervision, following established guidelines and standard operating procedures, good maintenance, use of newer equipment (emissions); minimizing wastes and reducing packaging (domestic/good/hazardous waste); and securing containment and utilizing biodegradable containers (human waste).

16. Clean-up, Reclamation, Disposal and/or Decommissioning Plans

As the proposed activity is anticipated to have less than a minor or transitory environmental impact, the necessity for any clean-up, reclamation, disposal and/or decommissioning plans is not expected.

17. Additional Information

Appendices:

- Appendix A: Voyage Plans 2018 (Voyage # CENFRNWP1801 and CENFRNWP1802)
- Appendix B: Route Maps (CENFRNWP1801 and CENFRNWP1802)
- Appendix C: MS FRAM Vessel Questionnaire
- Appendix D: Hurtigruten Expedition Staff List and Staff Biographical Sketches (current as of submission date)

Addendum: Supplemental Information for Nunavut

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Appendix A:

Voyage Plan 2018 - Voyage # CENFRNWP1801 and CENFRNWP1802

Date	Ship	Status	Port / site	ETA	ETD	TZ	Comments	Day	Distance	Time	Speed	Voyage #
8/29/18	FRAM	Anchored	Kangerlussuaq		8/29/18 23:59	-2	Embarking	0				2018-08-29 CENFRNWP1801
8/30/18	FRAM	Alongside	Sisimiut	8/30/18 13:00	8/30/18 18:00	-2	Bunkering	1	150	13	11.5	2018-08-29 CENFRNWP1801
8/31/18	FRAM	Anchored	Iluissat	8/31/18 9:00	8/31/18 18:00	-2		2	177	15	11.8	2018-08-29 CENFRNWP1801
9/1/18	FRAM	At Sea				-3		3				2018-08-29 CENFRNWP1801
9/2/18	FRAM	Cruising	Sam Ford Fjord	9/2/18 6:00	9/2/18 12:00	-4	Cruising only (no landing)	4	422	37	11.4	2018-08-29 CENFRNWP1801
9/3/18	FRAM	Anchored	Pond Inlet	9/3/18 6:00	9/3/18 13:00	-4	Clearance Canada	5	215	19	11.3	2018-08-29 CENFRNWP1801
9/3/18	FRAM	Cruising	Eclipse Sound (Milne Inlet)	9/3/18 17:00	9/3/18 20:00	-4	Cruise for wildlife - potential Narwhal in this area	5	55	4	13.8	2018-08-29 CENFRNWP1801
9/4/18	FRAM	Anchored	Dundas Harbour	9/4/18 7:00	9/4/18 12:00	-4	Landing at historic site. Hikes. Possible kayak.	6	147	11	13.4	2018-08-29 CENFRNWP1801
9/4/18	FRAM	Cruising	Croker Bay	9/4/18 15:00	9/4/18 18:00	-4	Tender boat/Ship cruise glacier	24	3	8		2018-08-29 CENFRNWP1801
9/5/18	FRAM	Anchored	Radstock Bay	9/5/18 7:00	9/5/18 12:00	-4	Landing at historic site. Hikes. Possible kayak. Hike Caswell Tower.	7	154	13	11.8	2018-08-29 CENFRNWP1801
9/5/18	FRAM	Anchored	Beechey Island	9/5/18 15:00	9/5/18 19:00	-4	Landing at historic site. Carefully managed landing in groups due to permit restrictions.	30	3	10		2018-08-29 CENFRNWP1801
9/6/18	FRAM	Anchored	Fort Ross	9/6/18 12:00		-5	Possible ice navigation. Overnight at anchor - scout Bellot Strait by boat	8	206	18	11.4	2018-08-29 CENFRNWP1801
9/7/18	FRAM	Cruising	Conningham Bay	9/7/18 14:00	9/7/18 18:00		Tender boat cruise - belugas and likely bears	53	5	10.6		2018-08-29 CENFRNWP1801
9/7/18	FRAM	Anchored	Fort Ross		9/7/18 9:00	-6	Transit Bellot Strait after departure	9				2018-08-29 CENFRNWP1801
9/8/18	FRAM	Cruising	James Ross Strait	9/8/18 6:00		-6	Navigation in daylight. Stop to be chosen based on conditions. Landing for hikes or zodiac cruises.	10	117	13	9	2018-08-29 CENFRNWP1801
9/9/18	FRAM	Anchored	Gjæa Haven	9/9/18 6:00	9/9/18 12:00	-6	May arrive evening before depending on location of afternoon landing. Town visit. PM Simpson Strait	11	103	24	4.3	2018-08-29 CENFRNWP1801
9/10/18	FRAM	Anchored	Cambridge Bay	9/10/18 8:00		-6	Disembarking	12	257	20	12.9	2018-08-29 CENFRNWP1801
9/10/18	FRAM	Anchored	Cambridge Bay		9/10/18 18:00	-6	Embarking	0				2018-09-10 CENFRNWP1802
9/11/18	FRAM	Anchored	Gjæa Haven	9/11/18 14:00	9/10/18 19:00	-6	Morning Simpson Strait, afternoon town visit	1	257	20	12.9	2018-09-10 CENFRNWP1802
9/12/18	FRAM	Anchored	James Ross Strait	9/12/18 8:00	9/12/18 18:00	-6	Stop to be chosen based on conditions. Landing for hikes or zodiac cruises	2	103	14	7.4	2018-09-10 CENFRNWP1802
9/13/18	FRAM	Anchored	Conningham Bay	9/13/18 8:00	9/13/18 12:00	-5		3	117	13	9	2018-09-10 CENFRNWP1802
9/13/18	FRAM	Anchored	Fort Ross	9/13/18 17:00		-5	Cruise Bellot Strait, at entrance 15:00	53	5	10.6		2018-09-10 CENFRNWP1802
9/14/18	FRAM	Anchored	Fort Ross		9/14/18 12:00	-4	Landing. Hike, kayak	4				2018-09-10 CENFRNWP1802
9/15/18	FRAM	Anchored	Radstock Bay	9/15/18 15:00	9/15/18 19:00	-4	Landing at historic site. Hikes. Possible kayak. Hike Caswell Tower.	30	3	10		2018-09-10 CENFRNWP1802
9/15/18	FRAM	Anchored	Beechey Island	9/15/18 7:00	9/15/18 12:00	-4	Landing at historic site. Carefully managed landing in groups due to permit restrictions	5	215	19	11.3	2018-09-10 CENFRNWP1802
9/16/18	FRAM	Cruising	Croker Bay	9/16/18 15:00	9/16/18 18:00	-4	Tender boat/Ship cruise glacier. No landing	24	3	8		2018-09-10 CENFRNWP1802
9/16/18	FRAM	Anchored	Dundas Harbour	9/16/18 7:00	9/16/18 12:00	-4	Landing at historic site. Hikes. Possible kayak	6	152	12	12.7	2018-09-10 CENFRNWP1802
9/17/18	FRAM	Anchored	Pond Inlet	9/17/18 14:00	9/17/18 19:00	-4	Town visit	55	4	13.8		2018-09-10 CENFRNWP1802
9/17/18	FRAM	Anchored	Eclipse Sound (Milne Inlet)	9/17/18 7:00	9/17/18 10:00	-4	Cruise for wildlife - potential Narwhal in this area	7	167	13	12.8	2018-09-10 CENFRNWP1802
9/18/18	FRAM	Cruising	Sam Ford Fjord	9/18/18 13:00	9/18/18 19:00	-3	Cruising only, possible wildlife	8	215	17	12.6	2018-09-10 CENFRNWP1802
9/19/18	FRAM	At Sea				-2		9				2018-09-10 CENFRNWP1802
9/20/18	FRAM	Anchored	Iluissat	9/20/18 8:00	9/20/18 18:00	-2		10	415	36	11.5	2018-09-10 CENFRNWP1802
9/21/18	FRAM	Alongside	Sisimiut	9/21/18 9:00	9/21/18 18:00	-2		11	177	15	11.8	2018-09-10 CENFRNWP1802
9/22/18	FRAM	Anchored	Kangerlussuaq	9/22/18 9:00		-2	Disembarking	12	150	15	10	2018-09-10 CENFRNWP1802

Appendix B: Route Maps

Westbound: Voyage # CENFRNWP1801

(Kangerlussuaq to Cambridge Bay)



Eastbound: Voyage #CENFRNWP1802

(Cambridge Bay to Kangerlussuaq)



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Appendix C: MS FRAM Vessel Questionnaire

Please refer to the next eight pages.

Vessel Name	MS FRAM
AIS-SART (AIS Search and Rescue Transmitters) in life-saving appliances	Yes – 4
Anchors	2
Arctic Trips Since Year	2007
Anti-fouling Certificate	Yes
Approved SOPEP	Yes
Automation System	Høglund Marine
Auxiliary Engine	NA
Ballast Amount – Normal Operation (m. ton)	215m ³
Ballast Capacity (m. ton)	711,4m ³
Ballast Exchange Frequency – (days)	0
Ballast Exchange Frequency - Normal Operation (days)	0
Ballast Water Management Plan	Yes
Bilge Water Holding Capacity (cbm)	17,3m ³
Bilge Water Holding Capacity (days)	30
Bilge Water Separator Type Approval Certificate (IMO Resolution MEPC 60 (33) 30 Oct 1992))	MEPC 107(49)
Bilge Water Separators (limited to below 15 ppm) (cbm / hours)	Yes - 2,5m ³
Black Water Management Plan	No. Follow Marpol rules and VGP
Black Water Capacity (cbm)	46,6m ³
Black Water Capacity (hours)	15 days. 367 hours
Boiler	Yes - Unex CHB-400
Bow	Bulbous
Breadth moulded (m)	20.19
Bridge to bow (m)	20,7
Bridge to Stern (m)	93,3
Call Sign	LADA7
Certified Black Water Treatment Plant	YES
Certified Oily Water Separator (OWS)	YES
Certified OWS with 15ppm Alarm & Automatic Shut-Off	YES
Class Notation	1A1 Car ferry A BIS E0 Ice(1B)
Classification Society	DNV-GL
Code (AECO – Post Visit Reporting)	Yes. Member of AECO
Crew Capacity	80
Damage Control Equipment	Yes
Damage Control Manual	Yes
Deadweight, Normal Operation (m. ton)	984
Depth moulded (m)	9,9m

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Diver & Equipment for Polar Waters	No
Draft Max (m)	5,1m
Echo Sounder 1,2,3, etc	1
Echo Sounder Transmission Power and Frequency	App 200w t 100khz,200khz or 50khz
Echo Sounder Type	Debeg 4630
Email	Captain: master@fr.hurtigruten.com Expedition Leader: expedisionleader@fr.hurtigruten.com
Emergency Generator	Yes
Emergency Medical Evaluation Response Plan	Yes
Fax	No
Fire Control Plan	Yes
Fresh Water Capacity (cbm)	272,7m ³
Fresh Water Consumption (cbm/24 Hrs)	65
Fresh Water Production (cbm/24 Hrs)	108m ³ /24hours
Fuel Consumption per 24 Hrs - Max (m. ton)	25m ³ /24hours
Fuel Consumption per 24 Hrs – Normal Cruising (m. ton)	18m ³ /24 hours
Fuel Consumption per 24 Hrs – Penetrating Ice (m. ton)	18m ³ /24 hours
Gas Oil (GO) Capacity – Normal Cruising (m. ton)	465,6m ³
GMDSS Sea Area	A4
Grey Water Capacity (cbm)	80
Grey Water Capacity (days)	1,5 days
Gross Tonnage	11647
Heavy Fuel Oil (HFO) Capacity – Normal Cruising (m. ton)	N/A
Helicopter Deck	No
Helicopters On Board	No
HFO Specification, Grade (IFO 380, IFO 180, >IFO, etc.)	N/A
HFO Storage Tanks (Type & Location)	N/A
Hull Material	Steel
Hydrographic Work	No
IAPP Certificate	Yes
Ice Class	ICE -1B
IMO Number	9370018
Incinerator Burning Temperatures	650 degr. c
Incinerator Capacity	300kg/hours
Incinerator Frequency of Use	Every second day
Incinerator Type	I.S.I.R eco 1004
International Air Pollution Prevention Certificate	Yes
International Oil Pollution Prevention Certificate	Yes
International Ship Security Certificate	Yes

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International Tonnage Certificate (1969)	Yes
IOPP Certificate	Yes
Length Overall (LOA) (m)	113,86m
Length Between Perpendiculars (LBP) (m)	99,95m
Lifeboats	2 x 150 persons. Partially closed
Liferafts (those for which approved launching appliances are required)	2 x MES. 424 persons total
Light ship	5720,7
LO Storage Tanks (Type & Location)	Abow B.L Frame 2-8
Lubricating Oil Capacity - Normal Cruising (m. ton)	5,6m3
Lubricating Oil Storage Tanks (Type & Location)	NA
Main Engine	MAK 6M25
Management Company	Hurtigruten
Maritime Labour Certificate	Yes
MARPOL 73/78 Annex IV Compliance	Yes
Medical Chest Certification	Yes
Member of AECO	Yes (member status)
Member of Other	IAATO (operator status)
MMSI	258932000
Morgue facilities	Yes
Name	MS FRAM
Net Tonnage	3818
Number of Doctors onboard	1
Number of hospital beds	2
Number of Nurses or other medical staff onboard	2
Number of Zodiacs/Landing Craft	5+2
Oil Record Book	Yes
Oil Spill Containment Equipment	Yes
Oil Spill Response Company	National Response Corporation (NRCorp)
Operator Name	Hurtigruten AS
Operational Area	Unlimited
P&I Insurance (Amount in USD)	The cover afforded for passengers and seamen/crew risks combined is limited to USD 3 billion (USD 3,000,000,000) any one event. The cover afforded for passenger risks shall further be limited to USD 2 billion (USD 2,000,000,000) any one event. (Coverage through Gard)
Passenger Capacity	318

Passenger Ship Safety Certificate (SOLAS 1974 as modified, regulation I/7, for international voyages)	Yes
Polar Water Operational Manual (IMO)	In progress. (Not completed yet.)
Pollution Liability Insurance (Amount in USD)	Limited to USD 1 billion (USD 1,000,000,000) each incident or occurrence (Coverage through Gard)
Port/Country of Registry	Tromsø, Norway
Propellers	2
Propulsion Motors	2
PSSC Total # of Persons	318
Rescue Boats	2
Safety Management Certificate	YES
SART (Radar Search and Rescue Transponders) in life-saving appliances)	Yes
Sel-Call	VHF/MF/HF DSC
Sewage Treatment Plant	BIOEPURO B/200 (2 units)
Sewage Holding Tank Capacity	46,6m ³
Shipboard Oil/Marine Pollution Emergency Plan (SOPEP/SMPEP)	Yes
Ship Type	Passenger vessel
Sludge Oil Holding Capacity (cbm)	9,4m ³
Sludge Oil Holding Capacity (days)	90
Sonar	Yes
Sonar Transmission Power and Frequency	110 khz
Sonar Type	Wesmar 860
Speed – Max (kn)	16
Speed - Normal Cruising (kn)	12
Stabilizers	Yes
Stability Declaration (SOLAS 74 Reg. 22 / LL Reg. 10(2))	Yes
Steering Gears	Azipull
Telephone/Telefax/Emergency Phones	Voice: Inmarsat c and Iridium INMARSAT M Satellite Stations: NA Fax: N/A LRIT : YES EPIRB(s): 2 HEX code: A048341934D35D1 MMSI 258932000 IMO:9370018 Call Sign: LADA 7 SARTS: 2
Telex	N/A
Thrusters	2

Under Water Welding Facilities	N/A
Untreated Grey Water Discharged Directly Overboard (cbm/hours)	25m ³ /24 hours
VDR	Yes
Vessel Type	Passenger vessel
Waste Management Plan	Yes
Water Consumption Rate (Daily amount (m ³))	65m ³
Water Retrieval Methods	Production on board (reverse osmosis)
Water Retrieval Location	Produced in Engine space
X-ray equipment	Yes
Year Built	Keel laid 2006 / Delivered 2007

- Radars SAM ELECTRONICS 1100
 - S band radar x2
 - X band radar x1
- RUTTER ICE NAVIGATOR Sea view version 7.11.4
- Chartplot SAM ELECTRONICS 1100 (6.19 build 96 from 20170615 OS Linux 9) x3
- Multipilot SAM ELECTRONICS 1100
- OLEX system ver 10.6
- Eco sounder SAM ELECTRONICS Debeg 46330
- Speed Log Skipper DL850
- SONAR Wesmar 860
- DGPS SAAB R4 Nav. System x3
- SATLOG Debeg 4100 DGPS
- VDR SAM ELECTRONICS
- Search lights:
 - Wiska search light x1
 - Norselight search light x2
- AIS transponder SAM ELECTRONICS 34x0 1.0 build 44 from 2011. 1101
- Gyro compass: Sperry marine NAVIGAT X MK1 MOB3
- Gyro repeaters: Sperry marine Type 4881-AB x2
- Switch over unit type 4932
- Magnetic compass: C.PLATH
 - steering compass type 2059
 - bearing compass type 2060
- NACOS XX5
- BNWAS SAM ELECTRONICS
- Heading management system SPERRY MARINE Navitwin IV
- CCTV Milestone Xprotector Smart Client 2013
- NAVstation
- NAVbox
- ENC data base (updated weekly)
- Paper chart
- C-map data base (CM93/3)
- ROT indicator Sperry marine x3
- RPM repeater for Azipull's and bow thrusters x3
- Sound powered telephone VINGTOR VSP211L
- SAM 4900 universal digital display x2
- Master clock monitor WEMPE
- Thies Clima wind indicator

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- Daylight signaling lamp
- Signaling panel KOCKUM Sonics TLG 2000 BSH6291/003/02
- External sound system KOCKUM SONICS S900C
- Talk back system STEENHANS CTB 20
- Navigational light panel
- Dynamic monitoring system SAJ-DMS
- Engine duty and alarm panel HOGLUND x2 Marine
- Engine information panel VAF instruments
- Ballast system HOGLUND
- Ballast water treatment plant TROJAN MARINE
- Steering stand ROLLS ROYCE
- Steering panel ROLLS ROYCE HELICON X3 x3
- Alarm panel SAM ELECTRONICS
- STABS
- Emergency anchorage panel Rolls Royce

Radio communications equipment: (GMDSS)

- Thrane & Thrane Sailor VHF DSC RT5022 x2
- Thrane & Thrane Sailor VHF C4900 x4
- Thrane & Thrane Sailor MF-HF HC 4500 x2
- Thrane & Thrane Sailor TT3606E message terminal (INMARSAT C)
- Thrane & Thrane Sailor H1252B printer x3
- Thrane & Thrane Sailor BP468 battery panel
- FLEET 77- NORA F77
- AIS SAAB R4
- EPIRB TRON 40S x2
- NAVTEX ICS NAV5
- PORTABLE VHF transceivers SP3300 x3
- RADAR SART MCMURDO S4
- RADAR SART TRON SART
- VHF emergency transceiver TRON AIR
- LRIT SAILOR 6140

Auxiliary Boats (Tender Boats):

Quantity: 5 Polarcircle boats – each of capacity of 8 persons including driver

Manufacturer: Helgeland Plast (Akva Group)

Engine type: 4-stroke Yamaha 80 Hp

Quantity: 2 Polarcircle boats – each of capacity of 12 persons including driver

Manufacturer: Helgeland Plast (Akva Group)

Engine type: 4-stroke Yamaha 200 Hp

Safety equipment in Tender Boats:

- First aid kit (prepacked and water tight)
- Emergency Kit (basic survival kit)
- Hand flares (3)
- Parachute rocket signal (1)
- Parachute anchor
- Basic tools for the engine
- Fire extinguisher
- Ropes and lines
- One towing line forward and one astern, ready for use
- Drift (or sea) anchor
- Paddle oar
- Navigation lights (fixed)

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- Boatman's hook
- GPS

Rockets and signals:

- Line throwing appliances with 8 rockets and lines
- 20 rocket parachute flares

Communications:

- Portable two-way VHF radiotelephone apparatus
- Search and rescue locating devices

Other life-saving appliances:

- Life-jackets for adults with whistle and light:
 - 480 pcs (Seamaster – 1983, Sunnmøre)
 - 8 pcs (Seamaster 1983) for persons on watch and for use at remotely located survival craft stations
 - 20 pcs (Seamaster 1983) for 5% of the total number of passengers on board passenger ships only)
 - 48 pcs (Seamaster 1983) for children (equal to at least 10% of the number of passengers)
 - 12 pcs. Infant Life-jackets equivalent to all infants on board (Regatta) (equal to at least 2.5% of the number of passengers)
 - 12 pcs Immersion suits (SeaMob work suits)
 - 18 pcs – number of Immersion Suits complying with the requirements for lifejackets (SeaMob work suits)
 - 16 pcs – number of Anti-exposure suits (for every person assigned to the crew the rescue boat or assigned to the MES party) (SeaMob work suits)
 - 16 pcs. – Thermal protective aids (for passenger ship only) (SeaMob work suits)
- Lifebuoys – 13 pcs
 - 2 pcs with light and smoke signal, capable of quick release from the Bridge
 - 11 pcs. with light and lifeline
 - 4 pcs with lights self-igniting
 - 2 pcs. without attachments

Fast Rigid Rescue Boats:

Quantity: 2 MOB boats – each of capacity of 6 persons

Manufacturer: Norsafe, model WHFRB 6, 5 DJ

Engine type: Bukh+Steyr144VT 4 stroke engine

Safety equipment: 2 oars or paddles; buoyant bailer; binnacle containing an efficient luminous compass; sea anchor with tripping line not less than 10 m in length; painter of sufficient length and strength at fore end; buoyant line not less than 50 m in length and strength to tow a liferaft; waterproof electric torch suitable for Morse signalling; spare set of batteries and spare bulb in waterproof container, whistle or equivalent; first-aid outfit in waterproof case; buoyant rescue quoits attached to buoyant line of not less than 30 m in length; portable fire-extinguishing equipment of an approved type (suitable for oil fires); searchlight able to operate continuously for at least three hours, radar reflector; thermal protective aids for 10% or 2, whichever is greater; boat hook; bucket; and knife or hatchet.

Approved by Bureau Veritas.

Kayaks:

Quantity: 6 double, 4 single

Equipment:

- Paddles 16 yellow, 13 black
- Dry suits: 6S, 7 M, 7 L, 7 XL, 4 XXL

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- Polar-Tec Fleece suit 6S, 7M, 7L, 7XL, 4XXL
- Lifejackets 9S/M, 13L/XL, 6XXL
- Neoprene Shoes size 39 7 pair, 40/41 10 pair, 42 3 pair, 43/44 10pair, 45 4 pair, 46/47 4 pair, 48 3 pair
- Neoprene Gloves 8XL, 7L, 10M, 5S
- Spray skirts 5
- Tow lines 3
- Safety equipment: Drift anchor, first aid kit, hypothermia kit, extra paddle, VHF radio, satellite phone, handheld GPS and extra base layer clothing for the paddler.

Appendix D: Hurtigruten Expedition Staff List and Staff Biographical Sketches (current as of submission date)

Please refer to the next 18 pages.

The staffing for the two voyages is as follows and is current as of submission of this document. Changes may occur between now and departure. If changes occur, replacements with similar backgrounds will be selected. Contact the Company for a final staff list, if so desired.

**CENFRNWP1801
and
Eastbound 10 - 22 September 2018 Voyage CENFRNWP1802**

**The Northwest Passage – In the Wake
of Great Explorers – Westbound
CENFRNWP1801:**

Expedition Leader: Karin Strand
Asst. Expedition Leader: Ralf Westphal
Expedition Coordinator: Thess Appelberg
Geologist: Bob Rowland
Geographer: Friederike Bronny
Ornithologist: John Chardine
Wildlife Biologist: Delphin Ruche
Culturalist: Sabine Barth
Historian: Henryk Wolsky
Kayak Guide: Tom Warmolts
Historian: Bjørn Skogstad
Archaeologist: Tim Rast
Cultural Interpreter, Inuit – TBA
Glaciologist: Olav Orheim
Photographer: Andrea Klaussner

Biographical sketches follow.

**The Northwest Passage – In the Wake
of Great Explorers – Eastbound
CENFRNWP1802:**

Expedition Leader(s): Mario Acquarone/Karin Strand
Asst. Expedition Leader: Helga Kristiansen
Expedition Coordinator: Thess Appelberg
Geologist: Bob Rowland
Geographer: Friederike Bronny
Ornithologist: John Chardine
Wildlife Biologist: Delphin Ruche
Historian: Henryk Wolsky
Kayak Guide: Tom Warmolts
Historian: Bjørn Skogstad
Archaeologist: Tim Rast
Cultural Interpreter, Inuit – TBA
Glaciologist: Olav Orheim
Photographer: Andrea Klaussner

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Hurtigruten AS

Name: Ms. Karin Strand
Title: Expedition Leader

Please see next page.



OUR EXPEDITION TEAM

Karin Strand

Operation and Expedition Teams Manager

EN Karin grew up among the Norwegian fjords and glaciers in "Jølster". She moved to Bergen in 1991, where she studied law at the University of Bergen. Karin changed her career plans due to passion of travelling and the oceans. No better place to be for that than Hurtigruten. She has worked on various ships in the fleet on various routes. Karin joined MS Nordnorge's first

DE Karin wuchs inmitten der norwegischen Fjorde und Gletscher in "Jølster" auf. 1991 ging sie nach Bergen, wo sie Recht an der Universität Bergen studierte. Aufgrund ihrer Leidenschaft fürs Reisen und die Ozeane änderte sie ihre Karrierepläne, für die es keinen besseren Platz als Hurtigruten gab. Sie hat auf verschiedenen Schiffen der Flotte und verschiedenen

adventures to Chile & Antarctica in 2002. Karin suffers from permanent polar fever, and roams the Polar Regions south and north throughout the year from Greenland, Svalbard and Antarctica, both when she is on the ship and in her time off. She is a keen kayak paddler and spends a lot of her spare time paddling in oceans and rivers in different parts of the

Routen gearbeitet. 2002 war Karin an Bord der MS Nordnorge auf deren erster Abenteuerfahrt nach Chile und in die Antarktis. Karin leidet am permanenten Polarfieber und durchstreift das ganze Jahr die Polarregionen in Nord und Süd von Grönland über Spitzbergen bis zur Antarktis, sowohl an Bord als auch in ihrer Freizeit. Sie ist leidenschaftliche Kayakfah-

world. A three week Antarctica paddling journey completed in 2016. Hiking is another passion. In 2013, she and two friends walked the Arctic Circle Trail in Greenland, 163km in 8 days carrying all food, tent etc. for the entire trip in their backpacks. The polar fever gets stronger every year.

rerin und verbringt einen Großteil ihrer Freizeit auf Ozeanen und Flüssen in aller Welt. 2016 paddelte sie drei Wochen in der Antarktis. Ihre andere Leidenschaft ist das Wandern. 2013 absolvierte sie mit zwei Freunden den Arctic Circle Trail in Grönland, 163km in 8 Tagen; Lebensmittel, Zelt usw. für die ganze Strecke im Rucksack tragend. Das Polarfieber wird immer stärker .



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OUR EXPEDITION TEAM

Ralf Westpal

Expeditionleader

EN. Ralf was captivated by the lore of nature, the sea and its music at an early age and soon would embark on seakajak trips - at times in tow with his accordion - to the North Frisian Islands of the Wadden Sea adjacent to the North German Coast. Ralf's love affair with the outdoors continued into adulthood when he became an Outward Bound instructor helping 'youth-at-risk' and young explorers become fit for life. His

DE Ralf wurde die Leidenschaft für Natur, Meer und die Musik in die Wiege gelegt. Aufgewachsen an der Nordseeküste, unweit von Dänemark, ist er bereits als junger Kerl im Kajak mit seinem Schifferklavier raus aufs Meer gefahren. Später hat er „Draußen sein“ auch beruflich zu seinem Zuhause gemacht: In Schottland und Norwegen promovierte er im Fach "Naturesport" (neudeutsch "Outdoor") und

passion led him to become an 'outdoor professional' developing into a University lecturer and professional guide in the Arctic and Antarctic regions. Ralf gained a Ph.D. in Outdoor Education at Edinburgh University and has held prominent positions in Germany, Scotland, Switzerland, Spain and Svalbard including Ranger, Outward Bound instructor as well as trekking- and sea-kayak guide within the

lies als Dozent Studenten der Sporthochschule Oslo und Universität Marburg an seiner Leidenschaft teilhaben. In sozialen Projekten machte der friesische Naturbursche Jugendliche mit seinem Outdoor-Wissen fit fürs Leben. Vom Packeis auf Spitzbergen bis hin zu den Passatwinden auf den Kanaren hat Ralf lange Jahre als Nationalpark-Ranger sowie als Trekking- und Kajak-Guide gearbeitet.

Nationalparks of Svalbard. Ralf also became a research associate for ethnographical research on Sail Training on Tall Ships, and lecturer with the Outdoor Department at the Norwegian School of Sport Science (NIH) in Oslo and the University of Marburg/Germany. Currently, Ralf is the expedition leader on board the Hurtigruten ship MS Nordlys.

Mit unserem "Dr. Outdoor" erleben die Hurtigruten-Gäste faszinierende maritime Landschaften, die lebendige Geschichte und die traditionsreiche Kultur der Küste Norwegens – garantiert mit einem Ständchen auf seinem Schifferklavier. Ralf arbeitet als Expeditionsleiter an Bord der MS Nordlys.



THESS APPELBERG

Expedition Coordinator

EN Thess was born in Sweden, but early on her interest for languages led her to language and cultural studies abroad and she has many years of experience within the travel industry. In 2009, after 15 years in San Diego

California, she came to Norway and was taken away by the extreme nature and wildlife, while travelling around the country and on board one of our ships. Since 2010 she has been working for Hurtigruten along the

Norwegian coast, as a Tour Leader on board MS Kong Harald. She remains an avid traveler, and shares her enthusiasm for adventure and nature with all our guests.

DE Thess wurde in Schweden geboren. Ihr großes Interesse an Sprachen führte sie zum Studium verschiedener sprachlicher und kultureller Fächer ins Ausland. Sie blickt auf einige Jahre Erfahrung in der Reisebranche zurück.

2009 kam sie nach 15 Jahren in San Diego, Kalifornien, nach Norwegen, und war fasziniert von der extremen Natur und der Tierwelt, die sie kennenlernte, als sie auf einem unserer Schiffe das Land bereiste.

Seit 2010 arbeitet sie für Hurtigruten auf der norwegischen Küstenstrecke als Tourenführerin an Bord von MS Kong Harald. Sie liebt es nach wie vor, zu reisen, und teilt ihre Begeisterung für Abenteuer und Natur mit allen unseren Gästen



BOB ROWLAND

Geologist and Guide / Geologe und Guide

EN As a geology under-graduate, he started working on oceanographic expeditions, traversing the Pacific and Indian Oceans. While in the US Army he spent two summers in Antarctica and two in Greenland, studying

engineering properties of snow and sea-ice. The field work for his PhD, was conducted along the coast of Alaska and offshore in the Northern Bering Sea. In 20 years with the US Geological Survey, the research ranged from Indonesia to Ivory Coast, and

encompassed pollution studies, environmental impact surveys plus project management and the UN Law of the Sea. He circumnavigated after retiring. Bob has been a consultant to the USGS on Law of the Sea issues.

DE Während seines Geologie-Studiums begann Bob auf ozeanografischen Expeditionsreisen zu arbeiten und überquerte im Rahmen dessen auch den Pazifischen und den Indischen Ozean. Während seiner Zeit in der US-Armee verbrachte er zwei Sommer in der Antarktis und zwei in Grönland,

wo er die ingenieursbezogenen Eigenschaften von Schnee und See-Eis studierte. Die Feldarbeit für seine Doktorarbeit wurde entlang der Küste Alaskas und in der Nord-Beringsee ausgeführt. Während seiner 20jährigen Tätigkeit für den US Geological Survey führten ihn seine Forschungen von Indonesien bis zur Elfenbeinküste und

beinhalteten Studien und Projekt Management im Bereich Umweltverschmutzung und Umwelteinflüsse sowie das UN Seerecht. Nach seiner Pensionierung segelte er um die Welt. Bob arbeitet zudem als Berater für die USGS im Bereich Seerecht.



OUR EXPEDITION TEAM

Friederike Bronny

Lecturer

EN. Friederike is a German geographer. She studied geography, geology and biology, specializing in polar regions, with the main focus on marine ecology and plant geography. Her graduate diploma focused on ecological and social

change in Greenland. She was a member and leader (with her husband) of several scientific expeditions to the west coast of Greenland. Frieda has published several books and essays. Since 1985, Frieda has worked on expedition cruise ships, and since 2005 only with

Hurtigruten. She enjoys sharing her many experiences with guests. Friederike lives in Münsterland with her husband Horst, and Ferdi, her German wire-haired Pointer.

DE Friederike ist eine deutsche Geographin (Ruhr-Universität Bochum). Sie spezialisierte sich schon früh auf die polaren Räume mit dem Schwerpunkt Meeresökologie und Vegetationsgeographie. Ihre Diplomarbeit schrieb sie über den ökologischen

und sozialen Wandel in Grönland. Sie war Teilnehmer und zusammen mit ihrem Ehemann Leiterin mehrerer Expeditionen an der grönländischen Westküste. Ihre Erfahrungen veröffentlichte sie in Büchern und Aufsätzen. Seit 1985 arbeitet

Friederike als Lektor auf verschiedenen Kreuzfahrtschiffen, seit 2005 ausschließlich für Hurtigruten. Sie liebt es ihre Erfahrungen mit den Gästen zu teilen. Friederike lebt im Münsterland, zusammen mit ihrem Ehemann und ihrem Deutsch Drahthaar Ferdi.



OUR EXPEDITION TEAM

John Chardine

Ornithologist

EN. John is a Canadian ornithologist. After undergraduate and graduate work (to Ph.D) in Canada and UK, he taught university before joining Environment Canada as a Seabird Research Scientist. He has published many papers and reports in

DE John ist ein kanadischer Ornithologe. Nach seinem Studium in Kanada promovierte er in England. Er arbeitete als Hochschullehrer, bevor er seine Arbeit als Wissenschaftler für die Forschung an Seevögeln bei der kanadischen Bundesregierung, Abteilung Umweltschutz,

scientific journals. His other career is as a lecturer aboard expedition cruise ships, which he has done for the past 25 years. He lectures on ornithology, climate change, oceanography, biogeography and ecology. John has been interested in

aufnahm. Er veröffentlichte viele Aufsätze in wissenschaftlichen Journalen. Parallel dazu begann er bereits vor 25 Jahren eine 2. Karriere als Lektor auf Expeditionsschiffen. Er hält Vorträge über Ornithologie, Klimawandel, Ozeanographie, Biogeographie und

birds and photography all his life and is also professional bird photographer. His images have been published widely in books and permanent exhibits.

Ökologie. John hat sich schon sein Leben lang für Vogelkunde ereifern können und ist auch ein professioneller Vogelfotograph. Seine Bilder sind vielfach in Büchern und Dauerausstellungen veröffentlicht.



DELPHIN RUCHÉ

Lecturer / Wildlife Biologist

EN As a wildlife biologist, Delphin has been using science as a passport to study and work around the world. This often brought him to mountainous and high-latitude regions, like Northern Canada where he completed his M.Sc., Antarctica where he overwintered at age 21,

or the Ethiopian Highlands where he helped promote a national park. He stayed several years in the USA, teaching at UCLA and participating in various nature conservation projects throughout the country. Meanwhile, he setup and ran a consulting company specialized in radar ornithology.

Every summer since 2011, Delphin studies seabirds in Svalbard for the Norwegian Polar Institute, but during the Arctic winter, he works as a northern lights guide in Northern Norway, where he now lives.

DE Delphin ist Biologe und nutzt die Wissenschaft als eine Art Pass um durch die Welt zu reisen, zu lernen und zu arbeiten. Dies führte ihn oft in bergige und hochgelegene Orte, wie zum Beispiel nach Nordkanada, wo er seinen Master of Science abschloss, in die Antarktis, wo er im Alter von 21 Jahren überwinterte oder in das äthiopische Hochland, wo er dabei half einen Nationalpark zu errichten.

Er verbrachte viele Jahre in den USA. Dort lehrte an der UCLA und beteiligte sich an verschiedenen Naturschutzprojekten überall im Land. Während dieser Zeit gründete und leitete er eine Beraterfirma, die sich auf den Radareinsatz im Bereich der Ornithologie spezialisierte.

Seit 2011 kommt Delphin jeden Sommer nach Svalbard um im Auftrag des Norwegischen Polarinstitutes die dortigen Seevögel zu untersuchen. Im Nordwinter arbeitet er als Polarlichtführer in Nordnorwegen, wo er auch lebt.



SABINE BARTH

Lecturer

EN Sabine Barth studied Theatre and film science, German, psychology and ethnology. She worked as an editor for two literature and cultural magazines and is working today as a freelance journalist. Her work focuses on the culture, literature and travel

mainly in Iceland and Greenland (since 1981). Sabine wrote travel literature about both countries and published in different medias, for example the radio. From 2001 until 2003 she was in charge of the Goethe-Centre in Reykjavik. Her topics are mainly

the culture, the social development and the history of the countries.

DE Sabine Barth studierte Theater-, Film- und Fernschwissenschaften, Germanistik, Sozialpsychologie und Völkerkunde. (Abschluss MA) Sie arbeitete u.a. als Dramaturgin, war leitende Redakteurin zweier Literatur- und Kulturzeitschriften und

ist heute freie Journalistin. Ihre thematischen Schwerpunkte sind Kultur, Literatur und Reisen, und hier vor allem die Länder Island und Grönland, die sie seit 1981 bereist. Über beide hat sie Reiseführer geschrieben und in weiteren Medien – z.B. im Rundfunk – veröffentlicht. Von

2001 bis 2003 leitete sie das Goethe-Zentrum in Reykjavik. Ihre Themen beschäftigen sich vor allem mit der Kultur, der gesellschaftlichen Entwicklung und der Geschichte der Länder.



HENRYK WOLSKI

Historian

EN Having been an enthusiastic sailor since boyhood, Henryk Wolski (Poland) worked after his university studies as a sailing instructor and skipper and organized concept sailing trips under historical mottos. Another facet of Henryk's life is the love to adventurous

expeditions. He was a member of ICESAIL Expedition that sailed around the North Pole and an expedition that retraced Sir Ernest Shackleton's famous voyage. Henryk organized different expeditions like following the tracks of the Vikings across the

European continent, or Expedition "Darwin & Tierra del Fuego" s with a replica of a whale boat. Since 2000, Henryk has been working regularly as expedition leader and lecturer on cruise ships, especially in the Antarctic, the Arctic and the Amazon.

DE Seit frühester Jugend mit der Seefahrt verbunden, machte er bald nach dem Studium seine Berufung zum Beruf und arbeitete als Segellehrer und Skipper, Später veranstaltete Segelreisen Concept Sailing, meistens nach historischen Motto. Umrundete Nordpol und nahm teil an der

Shackleton Expedition mit Arved Fuchs. Organisierte verschiedene Expeditionen wie Auf den Wikinger Spuren quer durch europäischen Kontinent in dem Nachbau eines Wikingerschiffes, oder „Darwin & Tierra del Fuego“ auf dem Nachbau eines Walfangbootes in den Gewässern des

Beagle-Kanal in Feuerland durch. Seit dem Jahr 2000 arbeitet Henryk regelmäßig als Expeditionsleiter und Lektor auf Kreuzfahrtschiffen, vor allem in der Antarktis, der Arktis und auf dem Amazonas.



TOM WARMOLTS

Lecturer

EN Tom was born in the Netherlands and grew up in the country side where his love for nature began. He studied International Trade and went to Paris to study Tourism and learn French. During his course and spare time, he worked in several countries to gain

experience in the tourism industry and practice his language skills. After having been a guide in Iceland, his fascination for the Polar Regions arose. Greenland was his next destination where he set up a Tour Operator and a Kayak base. Here he also first

got in touch with Fram, while organizing a landing for the passengers. He has worked as a Kayak Guide and lecturer for Hurtigruten for 3 years in all the destinations the company offers.

DE Tom ist Niederländer und ist auf dem Land aufgewachsen, wo seine Liebe zur Natur begann. Er studierte Internationalen Handel und zog später nach Paris um Internationalen Tourismus und Französisch zu lernen. Im Rahmen seines Studiums und in seiner Freizeit arbeitete er in verschiedenen Ländern, um Erfahrungen im Tourismus

zu sammeln und um seine Sprachkenntnisse zu erweitern. Nach seiner Zeit als Guide in Island wuchs sein Interesse an den Polarregionen. Grönland war sein nächstes Ziel. Hier gründete er eine Reiseagentur und eine Kayakschule. In Grönland kam er zum ersten Mal mit der Fram in Kontakt, als er einen Landaufenthalt

für unsere Passagiere organisierte. Er arbeitete jetzt 3 Jahren für Hurtigruten als Lektor und Kajakinstrukteur.



BJØRN BERGSJØ SKOGSTAD

Historian/Historiker

EN Bjørn was born and raised in Svolvær on the Lofoten islands, in the northern parts of Norway. In 2016 he finished a five-year integrated master's degree, comprising teaching studies and a research-based master's thesis at the University of Oslo.

His history master's thesis is about the scientific work conducted on Roald Amundsen's expedition with the Maud. The main focus was on the later well-known scientist Harald Ulrik Sverdrup. From 2012-2017, he worked as a lecturer and event host at the Fram Museum in Oslo.

This work focused on the three expeditions with the Fram. He is currently studying political science and Norwegian literature at the University of Oslo, working part time as a high school teacher.

DE Bjørn ist in Svolvær auf den Lofoten, im Norden Norwegens, aufgewachsen. 2016 beendete er sein Masterstudium im Bereich Lehramt und Wissenschaft an der Universität Oslo. Seine Masterarbeit schrieb er über die wissenschaftlichen

Studien, die während Roald Amundsens Expedition mit der MS Maud durchgeführt wurden. Der Hauptfokus lag dabei bei Harald Ulrik Sverdrup. Von 2012-2017 arbeitete er als Dozent und Veranstaltungsassistent im Fram

Museum in Oslo. Sein Schwerpunkt lag bei den drei Expeditionen der originalen MS Fram. Momentan studiert er Politikwissenschaften und norwegische Literatur an der Universität Oslo und arbeitet Teilzeit als Lehrer.



Tim Rast

Archaeologist

EN Tim Rast is a Canadian archaeologist and flintknapper who specializes in reconstructing the tools and lifeways of the earliest inhabitants of the North American Arctic and Sub-Arctic. From his first summer excavating Late Dorset sites in the High Arctic as a student at the University of Calgary, Tim fell in love with the north. He returns year-after-year to

preserve and protect archaeological sites ahead of major industrial developments, facilitate community archaeology programs, provide flintknapping workshops to students, and travel with visitors to the most remote corners of Nunavut. He lives in St. John's, Newfoundland and Labrador, where his research into the pre-Contact settlement patterns of

Newfoundland's south coast earned him a graduate degree from Memorial University of Newfoundland.

Over the decades, Tim has garnered an international reputation for meticulous and accurate reproductions of stone, bone, antler, and ivory artifacts spanning thousands of years of human ingenuity in the Arctic; technologies that he is passionate about sharing.

DEDeutsch

MS Fram
Hurtigruten AS

Inuit Cultural Interpreter

Name and bio to be advised closer to sailing time. (The position has not been filed as of document submission date.)



OUR EXPEDITION TEAM

Olav Orheim

Glaciologist

EN As glaciologist and climatologist Olav has led numerous scientific expeditions in the Arctic and Antarctica. He was Managing Director of Norwegian Polar Institute 1993 to 2005 and administrated polar research at the Research Council of Norway from 2005 to 2012. Born in Bergen, he acquired

his PhD in glaciology at Ohio State University studying the glacier history at Deception island. He worked for four decades at the Norwegian Polar Institute. In parallel he held a professorate in glaciology at the University of Bergen for nearly two decades. Olav was instrumental in the establishment of Norway's

permanent Antarctic station. He initiated the Norwegian Glacier Museum at Fjærland and the visitor center Polaria at Tromsø. He is presently the chairman of the board of the FRAM museum at Oslo and GRID-A in Arendal. Olav has received the Royal orders of St. Olav from Norway, and St. Charles from Monaco.

DE Als Glaziologe und Klimatologe hat Olav zahlreiche wissenschaftliche Expeditionen in die Arktis und Antarktis geleitet. Von 1993 bis 2005 war er Direktor des Norwegischen Instituts für Polarforschung und von 2005 bis 2012 leitete er die Polarforschung in Forschungsrat Norwegens. Geboren in Bergen, promovierte er in

Glaziologie an der Ohio State University über die Vergletschungsgeschichte von Deception island. Er arbeitete vier Jahrzehnte am Norwegischen Institut für Polarforschung. Parallel dazu hatte er eine Professur in Glaziologie an der Universität von Bergen. Er unterstützte massgeblich den Aufbau der ständigen Antarktisstation Norwegens.

Er initiierte das Norwegische Gletschermuseum in Fjærland und das Besucherzentrum Polaria in Tromsø. Derzeit ist er Vorstandsvorsitzender des FRAM-Museums in Oslo und GRID-A in Arendal. Olav ist Träger des königlichen St. Olav-Ordens von Norwegen und des St. Charles-Ordens von Monaco.



ANDREA KLAUSSNER

Photographer

EN Andrea Klaussner comes from Germany and loves nature, traveling and photography. She is as inspired by small unimposing flowers and wildlife as by majestic landscapes around the globe and very much

enjoys discovering new places and meeting people from different countries and cultures. Besides being an enthusiastic photographer, Andrea also very much enjoys sharing her photography knowledge in workshops. Andrea is

fascinated by the idea that with photography she can capture her view of something and allow others to take a glimpse at the world "through her eyes".

DE Andrea Klaussner kommt aus Deutschland und liebt die Natur, Reisen und natürlich die Fotografie. Sie kann sich für kleine, unscheinbare Pflänzchen und die bunte Tierwelt genauso begeistern wie für grandiose Landschaften

in aller Welt und freut sich immer wieder daran, neue Orte zu entdecken und Menschen aus unterschiedlichen Ländern und Kulturen zu begegnen. Andrea ist nicht nur begeisterte Fotografin, sondern gibt ihr Fachwissen auch gerne in Workshops

weiter. Am Fotografieren fasziniert Andrea, dass sie ihren ganz eigenen Blickwinkel festhalten und dadurch andere Menschen die Welt ein kleines bisschen „mit ihren Augen“ sehen lassen kann.



MARIO ACQUARONE

Expedition leader in training

EN Mario was born at the foot of the Alps, in Turin, and comes from a family of shipbuilders and navigators from Liguria. He began sailing and mountaineering from an early age and these activities inspired him to study Natural Sciences and specialize in Ecology. He is trained as a

researcher and holds a PhD on walrus which has given him the bases for his later work on the management of seal and whale populations in Denmark, Greenland, Norway, Iceland and the Faroe Islands. Before joining Hurtigruten, Mario has participated in expeditions in the

Mediterranean, the Arctic and the Antarctic as researcher, lecturer, guide and as expedition leader. He now lives in Tromsø and enjoys the excellent outdoor life possibilities that this location offers, from hiking, skiing to kayaking and wildlife watching.

DE Mario wurde am Fuß der Alpen, in Turin, geboren. Seine Familie hat eine lange Tradition in Schiffbau und Navigatoren. Schon in frühen Jahren begann er zu segeln und in den Bergen zu wandern, sodass für ihn bald klar war, dass er Naturwissenschaften mit dem Schwerpunkt

Ökologie studieren möchte. Er ist ausgebildete Forscher und hat seinen Doktor über die Walrosse geschrieben. Diese Ausbildung führte ihn nach Dänemark, Grönland, Norwegen, Island und auf die Färöer-Inseln. Bevor Mario nach Hurtigruten kam, nahm er an Expeditionen im Mittelmeer, in der Arktis

und der Antarktis als Forscher, Lektor, Führer und Expeditionsleiter teil. Heute lebt er in Tromsø und genießt die vielen Freizeitmöglichkeiten, die die Natur bietet: Wandern, Ski laufen, Kajaken und Tiere beobachten.



HELGA BÅRDSATTER KRISTIANSEN

Assistant Expedition Leader

EN Biology studies in Oslo brought Helga to Svalbard for the first time in 2011- she fell in love with the island and stayed for 2 summers and 5 years. Safe to say Svalbard left a print on her heart. Here she took her master degree in biology and worked as a guide for hiking groups, snow mobile tours, city guiding and as a manger for Camp Barentz.

Helga got tired of environmental problems in the Arctic was not solved quickly enough so she ventured in to politics as a green politician and was elected in to the local government in Longyearbyen. She was born in Telemark, Norway, a place rich with forests, and has always had a fascination for nature. She went to agriculture high school

and knows how to use a chain saw and drive a tractor. When not at sea she works as an Environmental Agent for Hurtigruten and as an Environmental Advocate. She is at the moment based in her childhood home in Telemark. And she loves dogs.

DE Helgas Biologiestudium brachte Sie 2011 zum ersten mal nach Spitzbergen - es war Liebe auf den ersten Blick. Sie ließ sich in Longyearbyen nieder und verbrachte zwei Sommer und insgesamt fünf Jahre dort. Ihr Masterstudium in Biologie schloss sie hier ab und arbeitete als Guide. Helga war es leid, dass die Umweltprobleme nicht schnell genug umgesetzt wurden,

weshalb Sie selbst aktiv wurde und sich politisch engagierte. Als grüne Politikerin wurde sie in das lokale Parlament in Longyearbyen gewählt. Sie wurde in der Telemark Region, in Norwegen geboren, wo sie umgeben von Wäldern die Natur zu Lieben lernte. Außerdem ging sie auf das Landwirtschaftsgymnasium und weiß bestens mit Kettensägen und Traktoren umzugehen.

Wenn Sie gerade zur See ist, ist Helga als Umweltschutz Repräsentant und Agent für die Hurtigruten unterwegs. Derzeitig lebt Helga in ihrer Kindheitsheimat Telemark.

Außerdem liebt Helga Hunde.

Addendum: Supplemental Information for Nunavut

Overview

Information is detailed below in regard to cruise ship operations in Nunavut in general and the particular regulations and/or requirements for the proposed activities applicable to operators visiting this province.

In addition to the Company and ship-specific information provided in MS FRAM's Environmental Impact Statement/Project Description, the following will identify specific measures the Company will take to carry out the planned activities of the vessel while in the region.

Operations In General

In addition to ensuring compliance with national laws and regulations (see below), the Nunavut operations of the MS FRAM have been planned to meet with general requirements as well as wider obligations under AECO membership applicable to Arctic operations (ref. www.aeco.no) while following established guidelines and standard operating procedures and international shipping requirements in general; and while tailoring the operation to the unique protocols required of operators to Canada, Nunavut and First Nation conservation lands and waters.

Hurtigruten has also planned the proposed activity to be conducted in the same manner similar to operations of the MS SPITSBERGEN and MS MIDNATSOL and other expedition vessels while in the Antarctic, South Georgia and other areas of the Arctic.

In general, operations of MS FRAM will comply with all applicable requirements for ensuring the preservation of wildlife and protection of the environment and to conform with any national laws or regulations applicable to ship-based tourism operations.

Federal Requirements

The following Acts and Regulations apply:

Aeronautics Act (<http://laws-lois.justice.gc.ca/eng/acts/A-2/>)

Anchorage Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-88-101/index.html>>.

Arctic Waters Pollution Prevention Act (AWPPA) <<http://laws-lois.justice.gc.ca/eng/acts/A-12/>>. The Act aims to prevent pollution in Canadian Arctic waters. The AWPPA is a 'zero discharge' act, which states, "no person or ship shall deposit or permit the deposit of waste of any type in the Arctic waters" -- however there are exceptions. The Regulations deal with the construction of ships (certain construction requirements for different navigation zones); bunkering stations; Arctic Pollution Prevention Certificates; Ice Navigator issues (any vessel planning to use the Arctic Ice Regime Shipping System and every tanker must have a qualified Ice Navigator on board); fuel and water concerns (enough of both on board before entering a zone); sewage deposit and oil deposit mishaps (unavoidable deposit only, that is, to save a life; or from damage to a ship from stranding, collision, or foundering if all reasonable precautions were taken). All vessels above 100 tons that navigate Canadian Arctic waters must comply with these regulations, including reporting requirements.

Arctic Waters Pollution Prevention Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 354/index.html>>

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Arctic Shipping Pollution Prevention Regulations (ASPPR) <http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._353/index.html>

Ballast Water Control and Management Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-237/index.html>>

Canada National Parks Act <<http://laws-lois.justice.gc.ca/eng/acts/n-14.0>>

Canadian Environmental Protection Act, 1999 <<http://laws-lois.justice.gc.ca/eng/acts/c-15.31/>>, an Act respecting pollution prevention and the protection of the environment and human health in order to contribute to sustainable development. The Proponent must "register with the Government of Nunavut, Dept. of Environment Manager of Pollution Control and Air Quality"

Canada Shipping Act, 2001 <<http://laws-lois.justice.gc.ca/eng/acts/c-10.15/>> A summary is available at <http://laws-lois.justice.gc.ca/eng/annualstatutes/2001_26/page-1.html>. This enactment overhauls and replaces the Canada Shipping Act, other than the portions that concern liability, with modernized legislation that will promote the safety and economic performance of the commercial marine industry as well as ensure the safety of those who use pleasure craft. Key changes to the existing legislation include improvements to provisions to protect and support efficient crews, ensure passenger and vessel safety and protect the environment. A new administrative penalties scheme provides an alternative means for dealing with certain contraventions.

Canada Wildlife Act, <<http://laws-lois.justice.gc.ca/eng/acts/w-9/index.html>>. The CWS is responsible for managing National Wildlife Areas and Migratory Bird Sanctuaries in Canada, which are set aside for the conservation of wildlife and wildlife habitat and established and regulated under the CWA and Regulations (below). NWAs and MBSs are co-managed by the CWS in partnership with Inuit communities that are located adjacent to these protected areas.

Charts and Nautical Publications Regulations, 1995 <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-95-149/index.html>>

Coastal Trading Act <<https://www.tc.gc.ca/eng/acts-regulations/acts-1992c31.htm>>

Collision Regulations <http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1416/index.html>

Fisheries Act <<http://laws-lois.justice.gc.ca/eng/acts/f-14/>>. Includes provisions for fish, marine mammals and fish habitat.

Fishing Regulations (<http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1120/index.html>

Life Saving Equipment Regulations <http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1436/index.html>. The Enabling Act is the Canada Shipping Act 2001.

Marine Liability Act <<http://laws-lois.justice.gc.ca/eng/acts/M-0.7/>>. This enactment consolidates certain rules of Canadian maritime law governing the civil liability of shipowners for loss of life, personal injuries and damage to property. (This extends the scope in the Canada Shipping Act, 2001.)

Marine Liability Act Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2002-307/>>

Marine Mammal Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-56/index.html>>

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Marine Personnel Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-115/index.html>>

Marine Transportation Security Act <<http://laws-lois.justice.gc.ca/eng/acts/M-0.8/>>

Marine Transportation Security Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2004-144/index.html>>

Migratory Birds Convention Act, 1994 and Migratory Birds Regulations <<http://laws-lois.justice.gc.ca/eng/acts/m-7.01/>>

Migratory Birds Regulations <<http://laws.justice.gc.ca/en/m-7.01/c.r.c.-c.1035/text.html>>

National Parks of Canada Fishing Regulations <http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1120/index.html>

Navigation Safety Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2005-134/index.html>>

Northern Canada Vessel Traffic Services Zone Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-127/page-1.html#h-1>>

Oceans Act <<http://laws-lois.justice.gc.ca/eng/acts/o-2.4/>>

Shipping Safety Control Zone Orders <http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._356/index.html>

Ship Station (Radio) Regulations, 1999 < Shipping Safety Control Zone Orders http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._356/index.html<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-260/index.html>>

Shipping Safety Control Zone Orders <http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._356/index.html>

Small Vessel Regulations <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-91/index.html>

Species at Risk Act <<http://laws-lois.justice.gc.ca/eng/acts/S-15.3/>>, while a Federal Act, the Act respecting the protection of wildlife species at risk in Canada, contains a list of Species at Risk in Nunavut in **Appendix A**.

Steering Appliances and Equipment Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-83-810/page-1.html#h-2>>

Transportation of Dangerous Goods Act, 1992 <<https://www.tc.gc.ca/eng/tdg/act-amendedact-69.htm>>

Transportation of Dangerous Goods Regulations <<https://www.tc.gc.ca/eng/tdg/safety-menu.htm>>

Vessel Certificates Regulations <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-31/index.html>>

Vessel Clearance Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-125/index.html>>

Voyage Data Recorder Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-203/index.html>>

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Wild Animal and Plant Protection Regulation of International and Interprovincial Trade Act
(<http://lois-laws.justice.gc.ca/eng/acts/W-8.5/index.html>)

Wild Animal and Plant Trade Regulations (WAPTR) (<http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-263/>)

Wildlife Act (<http://laws-lois.justice.gc.ca/eng/acts/W-9/>)

Wildlife Area Regulations <http://laws.justice.gc.ca/eng/regulations/C.R.C.,_c._1609/>

Nunavut in Particular

Land Claims Agreements:

The borders of Nunavut are designed by the *Nunavut Land Claims Agreement* <<http://www.gov.nu.ca/sites/default/files/files/013%20-%20Nunavut-Land-Claims-Agreement-English.pdf>> considered to be the most comprehensive Indigenous land claims treaty on the planet.

Territorial Acts and Regulations:

The *Nunavut Act* <<http://laws-lois.justice.gc.ca/eng/acts/N-28.6/>> established the territory of Canada to be known as Nunavut. It officially separated from the Northwest Territories on April 1, 1999 via the Nunavut Act and the *Nunavut Land Claims Agreement Act* <http://laws-lois.justice.gc.ca/eng/acts/n-28.7/>>

Archaeological and Paleontological Sites Regulations <<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2001-220/page-1.html>> - applies to all individuals who are landing at sites that have archaeological and/or paleontological remains.

Outfitter Regulations < <http://www.gov.nu.ca/outfitter-regulations>>

The *Nunavut Planning and Project Assessment Act* <<http://laws.justice.gc.ca/eng/acts/N-28.75/page-25.html>> clearly defines how resource development will be managed in Nunavut and establishes in legislation the continuation of the Nunavut Planning Commission (NPC) and Nunavut Impact Review Board (NIRB).

Territorial Parks Act <<http://www.gov.nu.ca/territorial-parks-act>>

Territorial Parks Regulations < <http://gov.nu.ca/territorial-parks-regulations>>

Nunavut Travel and Tourism Act < <http://nunavuttourism.com/images/documents/travel-and-tourism-act-summary-english.pdf>>. The purpose of the Act is to ensure that persons who wish to operate travel and tourism businesses in Nunavut are properly licensed and that guides, outfitters and tourism establishments hold the proper permits and certification in their trade. {The act does not apply to private yachts.}

Nunavut Wildlife Act <<https://www.canlii.org/en/nu/laws/stat/snu-2003-c-26/latest/snu-2003-c-26.html>> The Act contains provisions to protect and conserve wildlife and wildlife habitat, including specific protection measures for wildlife habitat and species at risk.

Nunavut Waters and Nunavut Surface Rights Tribunal Act <<http://laws-lois.justice.gc.ca/eng/acts/n-28.8/>>. The Act respects the water resources of Nunavut and the Nunavut Surface Rights Tribunal and makes consequential amendments to other Acts.

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Guidelines / Background Information:

National Guidelines to Minimize Marine Vessel-based Disturbance to Wildlife, Environment and Climate Change Canada <<http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=E3167D46-1>>

Department of Fisheries and Oceans Canada's Marine Wildlife Guidelines for Boaters, Paddlers and Viewers <<http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/mammals-mammiferes/view-observer-eng.html>>. The DFO provides guidelines to recreational boats and marine tourism operators in order to minimize disturbance to marine wildlife.

Fisheries Joint Management Committee's Beaufort Sea Beluga Management Plan <<http://www.dfo-mpo.gc.ca/Library/261696.pdf>>. The Plan includes Tourism Guidelines that also include reference to aircraft (for helicopter operations).

Environment and Climate Change Canada's Planning Ahead to Reduce the Risk of Detrimental Effects to Migratory Birds and their Nests and Eggs (web page and fact sheet) <<http://www.ec.gc.ca/paom-itmb/>>. Provides information on how to protect migratory birds, their nests and eggs when planning and carrying out activities.

Transport Canada's list of Protected Areas (shoreline and associated seas) <<https://www.tc.gc.ca/eng/marinesafety/tp-tp13670-menu-2315.htm>>.

WWF Principles and Codes of Conduct for Arctic Tourism <[http://awsassets.panda.org/downloads/codeofconductfortouroperatorsintheartic\(eng\).pdf](http://awsassets.panda.org/downloads/codeofconductfortouroperatorsintheartic(eng).pdf)>

WWF Keeping People and Polar Bears Safe <http://wwf.panda.org/wwf_news/?262357/Keeping-people-and-polar-bears-safe>

AECO Operational Guidelines 2017 (renewed annually; not yet updated for summer 2018) <<http://www.aeco.no/guidelines/operational-guidelines/>>

AECO Guidelines for Visitors to the Arctic (renewed annually) <<http://www.aeco.no/guidelines/visitor-guidelines/>>

AECO Biosecurity Guidelines for Visitors to the Arctic (renewed annually) <<https://www.aeco.no/guidelines/biosecurity-guidelines-2/>>

AECO Wildlife Guidelines (renewed annually) <<https://www.aeco.no/wildlife-guidelines/>>

AECO Community Guidelines (renewed annually) <<https://www.aeco.no/guidelines/community-guidelines/>>

Government of Nunavut's "Visitor Code of Conduct" and "Operator Code of Conduct" (available from Cruise Nunavut)