



## **Technical Data Report**

### **Framework for the Marine Mammal Protection Plan**

#### **ENBRIDGE NORTHERN GATEWAY PROJECT**

**Prepared for:**  
**Northern Gateway Pipelines Limited Partnership**

**Prepared by:**  
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# **1 Introduction**

## **1.1 Background**

Northern Gateway is committed to minimizing or eliminating adverse environmental effects of the Northern Gateway Pipelines Project on the marine environment. As part of this commitment, Northern Gateway will prepare a Marine Mammal Protection Plan (MMPP) to be completed six months before the start of operations of the Kitimat Terminal. Northern Gateway will also comply with applicable statutes and regulations pertaining to the protection of marine life and habitat.

This document provides a framework for how the MMPP will be developed and modified in light of new information and summarizes commitments by Northern Gateway of relevance to marine mammals. Following Project approval, Northern Gateway will develop the comprehensive MMPP through an engagement process that will include Fisheries and Oceans Canada (DFO), participating Aboriginal organizations, and external research organizations and experts. The MMPP will be a living document that may go through multiple iterations over the life of the Project.

## **1.2 Purpose of the MMPP**

The purpose of the MMPP is to outline measures that Northern Gateway will implement in the Project Effects Assessment Area (PEAA), Confined Channel Assessment Area (CCAA) and Open Water Area (OWA) to manage and monitor Project-related environmental effects on marine mammals associated with underwater noise, blasting, and other potential marine mammal-vessel interactions (cf. Volume 6B, Section 11 and Volume 8B, Sections 10 and 13).

## **1.3 Purpose of the Framework Document**

The purpose of this framework is to summarize the marine mammal mitigation, monitoring programs, and research initiatives committed to by Northern Gateway in the May 2010 Application and throughout the Information Request process, and describe the process through which the detailed MMPP will be developed.



## 2 Engagement and Consultation

In developing and executing the MMPP, Northern Gateway will engage key government agencies (e.g., DFO), participating Aboriginal groups, and the Kitimat community advisory board (CAB). Northern Gateway would also be willing to involve interested research organizations (e.g., North Coast Cetacean Society and Raincoast Conservation Foundation), industry groups (e.g., Chamber of Shipping BC) and other project proponents (e.g., Kitimat LNG).

Northern Gateway has committed to funding a Marine Research Chair at a university in British Columbia. Where it is agreed upon by the Marine Research Chair and Northern Gateway, programs and information from the MMPP will be integrated into research undertaken by the Marine Research Chair. Information from the Marine Research Chair may also be of value to the MMPP.

Funding and technical support for the MMPP would be provided by Northern Gateway. If other industrial interests (e.g., other project proponents, existing operators) choose to participate, funding and technical support might also be provided through these parties.





## **3 Approach**

### **3.1 Study Area Boundaries**

The geographic boundaries of the MMPP will include the PEAA (including the marine terminal PDA), the CCAA, the “CCAA approaches”<sup>1</sup>, and the broader OWA.

### **3.2 Biophysical Scope**

The biophysical scope of the MMPP will address all marine mammal species that could be directly or indirectly affected by routine Project activities within the study area boundaries. Attention will be given to species of cultural importance or heightened sensitivity to potential Project effects.

### **3.3 Monitoring Strategy**

Northern Gateway’s commitment to a focused marine mammal monitoring and survey program is unprecedented for a marine project in Canada. Information from both Project-specific monitoring of marine mammals and additional cooperative research initiatives will be employed by Northern Gateway as part of an adaptive approach to manage and monitor Project effects. This information will also be of value to other organizations focused on supporting the recovery strategies for species of conservation concern. Monitoring of marine mammals will be used to assess the effectiveness of the MMPP, identify and modify mitigation measures, or implement new measures, as appropriate.

It is important to note that reasonable, representative key indicators (KIs) in the May 2010 Application were used as part of the assessment process, as it would be impractical to do a complete assessment of more than 30 different marine mammal species. Going forward, monitoring conducted in the CCAA will include additional marine mammal species (i.e., not only the KIs). For example, during marine mammal surveys, sightings of all marine mammal species would be recorded. In some cases, species-specific research initiatives (e.g., for northern resident (NR) killer whales) may also be implemented. Results from marine mammal monitoring surveys and research initiatives are expected to improve the regional understanding of all marine mammal species’ timing and distribution within the CCAA.

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<sup>1</sup> The term “CCAA approaches” is used here to replace the term “approach lanes”, which was used in the Application (see May 2010 Application, Volume 8B, Section 2.4.1). These areas, the exact geographic extents of which have not yet been defined, are not meant to define shipping lanes, but instead are used solely to describe areas of the OWA in proximity to the Northern and Southern Approaches to the CCAA, within which additional marine mammal mitigation measures (e.g., seasonal speed restrictions) may apply.



## 4 Components of the MMPP

The MMPP will include details on such measures as:

- low-noise propulsion systems on purpose built Project-related vessels (e.g., tug escorts and support vessels for the marine terminal)
- reduced vessel speeds in the CCAA and in the “CCAA approaches”
- attempting to better understand the behavioural responses of NR killer whales to tankers and tugs
- identifying important habitat for NR killer whales and other cetaceans, as well as seasonal use of these habitats
- use of the results of a science-based quantitative vessel–marine mammal strike risk analysis
- to the extent practicable, allowing for tanker route adjustments (taking into account navigational and human safety) to avoid sensitive cetacean habitat during important seasonal periods
- undertaking a cooperative research initiative with other participating organizations to determine potential effects on marine mammals and to develop industry protocols to limit these effects

A preliminary outline of major initiatives is provided in the following sections.

### 4.1 Construction and Decommissioning Mitigation Measures and Monitoring Programs

#### 4.1.1 Description of Measure

To reduce the likelihood and extent of adverse effects on marine mammals during construction and decommissioning of the Kitimat Terminal (primarily associated with underwater noise), Northern Gateway will implement a variety of best industry practices and mitigation measures. The current frameworks of these commitments are outlined below.

##### ***Blasting Management Plan***

- During construction of the Kitimat Terminal, Project activities will comply with DFO guidelines for underwater blasting. Northern Gateway will develop a Blasting Management Plan, as per the requirements of Natural Resources Canada, and will consult with DFO in developing this plan to avoid and reduce potential environmental effects on marine mammals from underwater blasting.
- With respect to marine mammals, the Blasting Management Plan will address:
  - appropriate measures to reduce overpressure, including optimum use of explosives for rock blasting
  - the zone of potential physical injury to marine mammals (safety radius), which will be calculated before construction

- regular marine mammal detection surveys within the identified zone of potential physical injury (see below).

#### ***Marine Mammal Detection Surveys (Shore-based during Blasting Operations)***

- During underwater blasting operations associated with construction of the marine terminal, detonation will not take place while a marine mammal is inside a predetermined safety radius. This is to reduce the exposure of marine mammals to blasting effects. A trained observer will conduct dedicated marine mammal detection surveys before any blasting. Prior to blasting activities, if a marine mammal is detected in the predetermined safety radius, blasting will be suspended until the marine mammal has moved beyond the safety radius.

#### ***Marine Mammal Monitoring Program (Shore-based during Dredging and Drilling)***

- Similar to the marine mammal detection surveys, Northern Gateway will implement a marine mammal monitoring program at the marine terminal during inwater construction activities such as dredging and pile rock drilling. Trained marine mammal observers (MMOs) will monitor a predetermined safety radius around the acoustic source. If a marine mammal enters the safety radius, the construction activity applicable to that radius will temporarily stop, until the marine mammal has moved outside the safety radius.

#### ***Work Windows***

- To reduce potential environmental effects of the Project on marine mammals, Northern Gateway will develop work windows for inwater site preparation and construction activities in consultation with DFO. Work windows will take into consideration seasonal marine mammal (and marine fish) diversity and abundance in the PEAA as well as appropriate mitigation measures to minimize effects from construction activities on marine mammals.

#### ***Silt and Bubble Curtains***

- An assessment will be made (in consultation with DFO) on the efficacy of the use of silt curtains and bubble curtains to mitigate the effects of suspended sediments and noise, respectively.

#### **4.1.2 Future Activities**

Further details on the specifics as they relate to marine mammals, will be developed in conjunction with the overall Blasting Management Plan outlined in Volume 7A, Appendix A.3.9 of the May 2010 Application.

Predictive acoustic modelling to determine the blasting operations safety radius will be carried out once the detailed engineering design phase for construction of the marine terminal is complete, and specifics of blasting operations are finalized.

The extent of the safety radius (applied during blasting operations) will be determined by predictive acoustic modelling, and will be based on the blast design (i.e., charge, delay, depth) and the hearing of marine mammals known to occur in the PEAA.

The specified safety radius applied during dredging and pile rock drilling will be based, in part, on sound source validation studies of actual equipment used for construction (e.g., dredge and pile drilling equipment). Inwater sound data from construction equipment will be collected and quickly analyzed to accurately determine appropriate safety distances.

### **4.1.3 Funding Approach**

Northern Gateway will fund the marine mammal mitigation and monitoring programs during activities associated with construction of the Kitimat Terminal. This includes but is not limited to providing training and employment of any local Aboriginals that are engaged as MMOs.

## **4.2 Minimizing Vessel Strikes**

### **4.2.1 Description of Measure**

Northern Gateway will not own or operate the tankers that call at the marine terminal. Nonetheless, through its tanker vetting process, Northern Gateway will require that tankers calling at the Kitimat Terminal are operated according to industry best practices and in an environmentally responsible manner.

To minimize the likelihood of marine mammal injury resulting from a tanker strike during Project-related marine transportation activities, Northern Gateway will implement a variety of mitigation measures and scientific research initiatives. An overview of these commitments is provided below.

#### ***Vessel Speed Restrictions***

- To decrease the likelihood of a lethal vessel strike, tankers and tugs will travel at 8 to 10 knots when in the core humpback whale area<sup>2</sup> (see Figure 1) at certain times of the year, unless otherwise required for safe navigation. These speed restrictions are currently proposed for the period of 1 May to 1 November; however, the spatial and temporal boundaries of the core humpback whale area will be refined from data collected through marine mammal density surveys and the quantitative vessel strike analysis (see below).
- Throughout the remainder of the year in the core humpback whale area, and year-round in the CCAA outside of the core humpback whale area, tankers and accompanying escort tugs will travel at a maximum speed of 10 to 12 knots.

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<sup>2</sup> The term ‘core humpback whale area’ was used in the May 2010 Application to identify the area within the CCAA where, at certain times of the year, peak humpback whale abundance may be expected (i.e., Otter Channel, the eastern area of Caamaño Sound, Squally Channel, Lewis Passage and Wright Sound; see Figure 1). It is important to note, however, that the exact boundaries of this area will be refined based on surveys conducted to determine densities and distribution of all marine mammals, and thus mitigations specific to this area will apply equally well to other species expected to be present (e.g., fin whales and NR killer whales) and not only humpback whales.

- Unaccompanied tugs may transit the CCAA at speeds of up to 15 knots, except while in the core humpback whale area during 1 May to 1 November, as described above.
- In the “CCAA approaches”, Northern Gateway will require tanker speeds to be less than 14 knots for the period 1 May to 1 November. Surveying of seasonal whale densities and distributions will again be used to better define this period, and the quantitative vessel strike analysis (see below) will be used to better define the geographical extent of this area. Otherwise, tanker speeds in the OWA will generally be in the range of 14 to 16 knots.

### ***Routing***

- All vessels will follow routes within the Northern and Southern Approaches (as decided by the shipmaster in consultation with the pilot) for inbound and outbound transits of the CCAA. Subject to navigational safety, local minor adjustments of the vessel routes may occasionally be used on a seasonal basis to avoid important seasonal areas used by some marine mammal species.

### ***Quantitative Vessel Strike Analysis***

- Northern Gateway has committed to undertake a quantitative study of vessel-marine mammal strike risks in an attempt to better delineate high risk areas for vessel-marine mammal strikes and the seasonal changes in these areas.
- This study will be conducted through a collaborative approach, guided by a working group of technical experts, including participants from Northern Gateway. Funding will be provided by Northern Gateway. The final report will be peer-reviewed and the working group’s scientific assessment will be made publicly available. DFO, Aboriginal groups, third-party independent marine mammal experts and marine technical experts will be invited to participate.
- The primary objective of the marine mammal–vessel strike analysis is to determine the likelihood (in terms of probability) and estimated frequency of a ship strike. The analysis will be spatial in nature, thereby allowing the model to predict areas along the vessel route that (based on available data) are at highest risk of a strike. Information from the analytical model will be used to inform the development of the MMPP, especially in relation to vessel strikes.
- The model will be developed based on two datasets: 1) the cumulative number of vessels (both current and including proposed vessel traffic), and 2) the distribution and abundance of marine mammals in the Project area and along the established marine routes.
- The analysis will include:
  - requesting and incorporating marine mammal density and distribution data from DFO and other research organizations (e.g., Raincoast Conservation Foundation, North Coast Cetacean Society)
  - collecting additional field data for marine mammal density and distribution in the CCAA and the “CCAA approaches” (see below)

- analysis of vessel strike risk (as noted above)
- refining mitigation measures (e.g., geographic boundaries for the core humpback whale area and the “CCAA approaches” as well as temporal windows for peak whale densities and risk).

### ***Marine Mammal Density Surveys***

- Northern Gateway has committed to conducting dedicated marine mammal surveys of the CCAA, implemented by trained observers using statistically rigorous techniques, such as distance sampling methodology. Surveys will be designed and analyzed using generally accepted line-transect survey protocols and software (i.e., ‘Distance’ computer program).
- The geographic scope of these surveys will focus on the CCAA, but will also involve the “CCAA approaches”. Generally speaking, densities in the PEAA will be captured in the broader CCAA surveys.
- Survey design will be sufficient to provide a baseline (e.g., before construction), account for variability between years, and provide a minimum sampling frequency capable of resolving seasonal changes in marine mammal abundance.
- The purpose of the surveys is to gain a more quantitative understanding of the density and distribution, along with seasonal timing, of marine mammals in the PEAA and CCAA, and to a lesser extent, the “CCAA approaches” within the OWA. This will aid in refining mitigations to more accurately reflect the needs of marine mammals.

### ***Whale Spotting Vessel/Program***

- A whale spotting vessel will be operated in the initial years of the Project to identify the locations of whales within the core humpback whale area and immediately adjacent areas.
- During tanker transits through these areas, the whale-spotting vessel will be used to visually identify whales and other marine mammals in the area. The whale-spotting vessel will be staffed by trained marine mammal observers, preferably from nearby participating Aboriginal communities.
- During daylight hours, the spotting vessel will complete a surveillance cruise of the portion of the core humpback whale area that will be travelled by an approaching tanker approximately 30 to 60 minutes before the passage of that tanker. It is expected that the vessels would operate primarily during 1 May to 1 November (note: monitoring of seasonal whale densities and distributions will again be used to better define this period and areas of specific interest).
- When whales are identified, by visual observation or remote detection techniques (e.g., passive acoustic monitoring), MMOs will notify the bridge of the tanker of the location of the whales. The shipmaster and pilot will decide the most appropriate actions that can be taken without compromising safety of navigation.

### ***Remote Detection Techniques***

- While the MMOs on the whale spotting vessel will keep a constant (seasonal) watch during daylight, there will be transits during which weather or timing (i.e., night transits or heavy sea states) will limit the ability to detect whales visually. Due to these limitations, Northern Gateway has committed to the use of remote detection technology to assist in the detection of marine mammals under adverse conditions.
- Following Project approval, Northern Gateway will commit to the use of some form of remote detection technology to (1) improve baseline data gaps, and (2) assist in the detection of marine mammals along the navigation routes through the core humpback whale area.
- Northern Gateway is considering several remote detection options (including infrared and land-based radar), although passive acoustic monitoring (PAM) is currently considered to be the most promising. PAM provides a permanent audible record, allows acoustic detections at greater than the visual range, is less tiring and onerous than visual observations, can be monitored 24 hours a day, and is effective in poor visibility and weather conditions.

### ***Port Information and Operations Manual***

- Northern Gateway will develop a Port Information and Operations Manual for any tanker proposing to call at the Kitimat Terminal. This manual will include details such as:
  - speed zones for vessels within the CCAA and route adjustments (see ‘Vessel Speed Restrictions’ and ‘Routing’ above)
  - the whale-spotting program
  - non-compliance with measures.
- As part of the Northern Gateway vetting process, the vessel’s owners must agree to abide by Northern Gateway’s Terminal Regulations, which will include operational procedures (e.g., speed restrictions) required by Northern Gateway.

### ***Informational DVD Package for Vessels Travelling to the Kitimat Terminal***

- Northern Gateway will develop an informational DVD and video package. It will be provided to all ship agents and tanker operators calling at the Kitimat Terminal, and operators of tugs and vessels supporting Kitimat Terminal marine operations. The package will describe the human, cultural and biological sensitivities of the area, with specific reference to the coastal Aboriginal communities. Specific details will be provided about vessel operating procedures, the whale spotting program, the rationale for these measures, and the importance of adhering to them. The master of the vessel will be responsible for ensuring all bridge officers and crew are aware of the whale mitigation procedures.
- Vessel operators (tugs and tankers) will be provided with marine mammal awareness material to further reduce interactions between vessels and in the CCAA.



### **Ship Communication System**

- All whales detected by whale spotting vessels, remote sensing techniques, and vessel operators, will be reported via a marine communication system, so that Northern Gateway (and potentially other) traffic is made aware of whale locations.

#### **4.2.2 Future Activities**

- Currently available information on the seasonal distribution of humpback whales in the CCAA suggests that this species occurs in greater numbers in Wright Sound, Squally Channel, Campania Sound and Caamaño Sound from May to November. For the purpose of the assessment, these areas were referred to collectively as the core humpback whale area. The spatial and temporal boundary of the core humpback whale area<sup>3</sup> will be refined through data collected by the marine mammal density surveys and the quantitative vessel strike analysis.
- There is also a need to better define the spatial extent and temporal window for reduced vessel speeds in the “CCAA approaches”. Northern Gateway will commit to at least a four- year PAM study (two years prior to operations and two years after start of operations) with an option for additional years if required. Following Project approval, a study design will be developed that describes the objectives, scope, methodology, data analyses, adaptive management approaches, reporting and communications. Northern Gateway is open to and encourages involvement of the federal government, universities, Aboriginal groups and additional stakeholders (e.g., Cetacealab) if these parties are interested in participating.
- The same investigation would also be used to examine the effectiveness of real-time acoustic monitoring systems that could be employed to actively detect whales in advance of vessel transits through important marine mammal habitat, specifically, the core humpback whale area. The goal is to be able to use real-time detection to supplement human observers and thus avoid vessel interactions with marine mammals (i.e., by making informed decisions concerning modification of vessel speeds or the use of alternative vessel routes), particularly during periods of reduced visibility.

#### **4.2.3 Timing of Future Activities**

Northern Gateway will undertake the science-based quantitative vessel–marine mammal strike risk analysis before operations (vessel transits) commence. Results will be incorporated into the MMPP and mitigation activities as currently outlined will be reviewed, as appropriate, through consultation with DFO and marine technical experts.

Marine mammal density surveys in the CCAA will be conducted 6 – 12 times per year. In the vicinity of the marine terminal, marine mammal surveys will be completed for a minimum of three years prior to the start of construction and for 2 – 3 years after the start of operations. Surveys of the remainder of the

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<sup>3</sup> As noted previously, use of humpback whales in the May 2010 Application as a reasonable, representative KI was intended only for the purposes of the assessment process. Going forward, monitoring conducted in the CCAA (e.g., marine mammal density surveys) will include additional marine mammal species (i.e., not only the KIs) and refinement of the ‘core humpback whale area’ will also take into consideration other cetacean species.

CCAA will be conducted for a minimum of three years prior to start of operations and will continue for two to three years after the start of operations.

#### **4.2.4 Funding Approach**

Northern Gateway will provide funding for the marine mammal density surveys, the whale spotting vessel (and its operations), the quantitative vessel strike analysis, the remote detection techniques and the other initiatives committed to in this document. Participation by other existing vessel operators and marine transportation proponents in conducting and funding any of these activities would be strongly encouraged.

### **4.3 Managing Underwater Noise**

#### **4.3.1 Description of Measure**

To reduce the likelihood and extent of adverse effects of underwater noise on marine mammals (from construction and decommissioning of the marine terminal and during routine marine transportation operations), Northern Gateway will implement a variety of best industry practices and mitigation measures. The current framework of these commitments is outlined below.

##### ***Vessel Speed Restrictions***

- Vessel-based underwater sound typically increases with speed; the greater the vessel speed, the greater the propeller cavitation noise (Fischer and Brown 2005). Consequently, the maximum speed restriction for all Project-related tankers of 10 to 12 knots within the CCAA and 8 to 10 knots within the core humpback whale area during 1 May to 1 November, unless otherwise required for safe navigation, will limit underwater noise.

##### ***Construction and Decommissioning Support Vessels, and Operations Line-handling Boats***

- Propellers of all construction and support vessels used during operations (e.g., for boom deployment and berth monitoring) will be well maintained and inspected for damage (e.g., bent blades, nicks in the blade); poorly maintained propellers are known to increase underwater noise.
- When possible, vessel operators will slowly increase vessel speeds and avoid unnecessarily rapid acceleration (which causes increased cavitation and noise).

##### ***Berthed Tankers***

- Tankers berthed at the marine terminal will employ all reasonable measures to reduce underwater noise. Ship operators will normally only run the minimum required number of ship service diesel generators to minimize wear and tear, maximize efficiency, and allow for maintenance on the generators that are off-line.

### ***Tugs – Low noise Propulsion Systems***

- Field studies conducted post-filing of the May 2010 Application (see MacGillivray 2010 and Chorney et al. 2011<sup>4</sup>) measured underwater sound from a tug equipped with Voith-Schneider propulsion (VSP) technology, and acoustic modelling was revised to more accurately simulate ensouffication produced by Project-related vessels. Measurements of the VSP escort tug obtained at Valdez did not indicate significant noise savings in comparison to conventional propulsion, except possibly at infrasound frequencies (below 40 Hz). Regardless, Northern Gateway remains committed to incorporating best commercially available technology at the time of the design and construction of purpose-built tugs (primarily in engine vibration reduction and propeller design) so that escort and harbour tugs produce the least underwater noise possible.

### ***Routing***

- Northern Gateway will consider the use of route adjustments (taking into account navigational safety) within the core humpback whale area or other identified sensitive marine mammal habitat during important seasonal periods, so that acoustic disturbances are constrained to similar and predictable areas during marine transportation.

## **4.4 Cooperative Research Initiatives and Identification of Important Marine Mammal Habitat**

### **4.4.1 Description of Measure**

Northern Gateway has committed to undertaking a cooperative research initiative and broad-scale regional assessment program in collaboration with other interested parties including government, industry (shipping, fishing and recreational fishing), participating Aboriginal groups and stakeholders. The objectives of the research initiative will be to:

- determine potential behavioural changes and associated effects of underwater noise on NR killer whales and other marine mammals (such as increased energy expenditure or reduced foraging efficiency)
- identify important habitat for the NR killer whale and other cetaceans (including the distribution of their key prey [e.g., salmon]) within the CCAA, as well as seasonal use of these habitats
- address important data gaps and identify options for monitoring and reducing underwater sound levels throughout the CCAA

Further details on some of these initiatives are provided below. Any of these research topics might be spearheaded through an independent third party under the direction of the Marine Research Chair.

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<sup>4</sup> These two reports make up Parts I and II, respectively, of Northern Gateway's *Marine Acoustics 2011 Technical Data Report*, contained in Section 2 of the 2012 Marine Acoustic Supplement, which was filed with the JRP in July 2012.

### ***Identification of Important Salmon Habitat***

- Data specific to the importance of the CCAA as potential feeding habitat for NR killer whales will be collected by Northern Gateway in association or consultation with participating local Aboriginal groups and DFO.

### ***Behavioural Changes and Associated Effects***

- Northern Gateway will take a lead role in researching (with other interested parties) potential marine mammal behavioural changes in response to construction and operational activities, and associated potential effects such as increased energy expenditure or reduced foraging efficiency.
- Northern Gateway will work with local partners (i.e., government agencies, participating coastal Aboriginal organizations, researchers and stakeholders) to develop studies capable of collecting behavioural response data, including observations of behavioural reactions upon exposure to tanker sound.

### ***Industry Initiatives***

- Northern Gateway is prepared to work with other project operators (e.g., Kitimat LNG, Rio Tinto Alcan, BC LNG, Shell, shipping companies), participating Aboriginal communities, government agencies (e.g., Transport Canada, Canadian Coast Guard, DFO, Pacific Pilotage Authority) and stakeholders (e.g., BC Coast Pilots) to develop mitigation measures for limiting the effects of vessels on marine mammals.

#### **4.4.2 Timing of Future Activities**

Further details concerning the nature of the Marine Research Chair position and an invitation for parties to submit an expression of interest will be developed and released following Project approval.

#### **4.4.3 Funding Approach**

Funding for the Marine Research Chair will be provided by Northern Gateway. However, other proponents and industry can help to sponsor and continue this position as part of the collaborative initiative. Their participation will be strongly encouraged.

## 5 Reporting and Communication

Northern Gateway encourages open and transparent sharing of results from MMPP studies. There are a number of ways in which this can be achieved, including but not limited to:

- annual reporting by a joint MMPP technical committee
- use of a website to act as a central repository for data and reports
- publication of data in peer-reviewed journals
- presentation of data at society meetings or conferences
- CAB websites and bulletins.



## **6 Financial Support**

Northern Gateway is committed to providing financial support for the development and implementation of the MMPP. Many of the concerns regarding potential effects of marine transportation are shared by numerous commercial vessel operators, terminal operators and other local marine resource users that operate in the CCAA and OWA. Cooperative funding and participation of other vessel operators, as well as other terminal operators in Kitimat Arm will be strongly encouraged. Additional funding sources could include partnerships with academic research consortia and research foundations.





## 7 Timeline

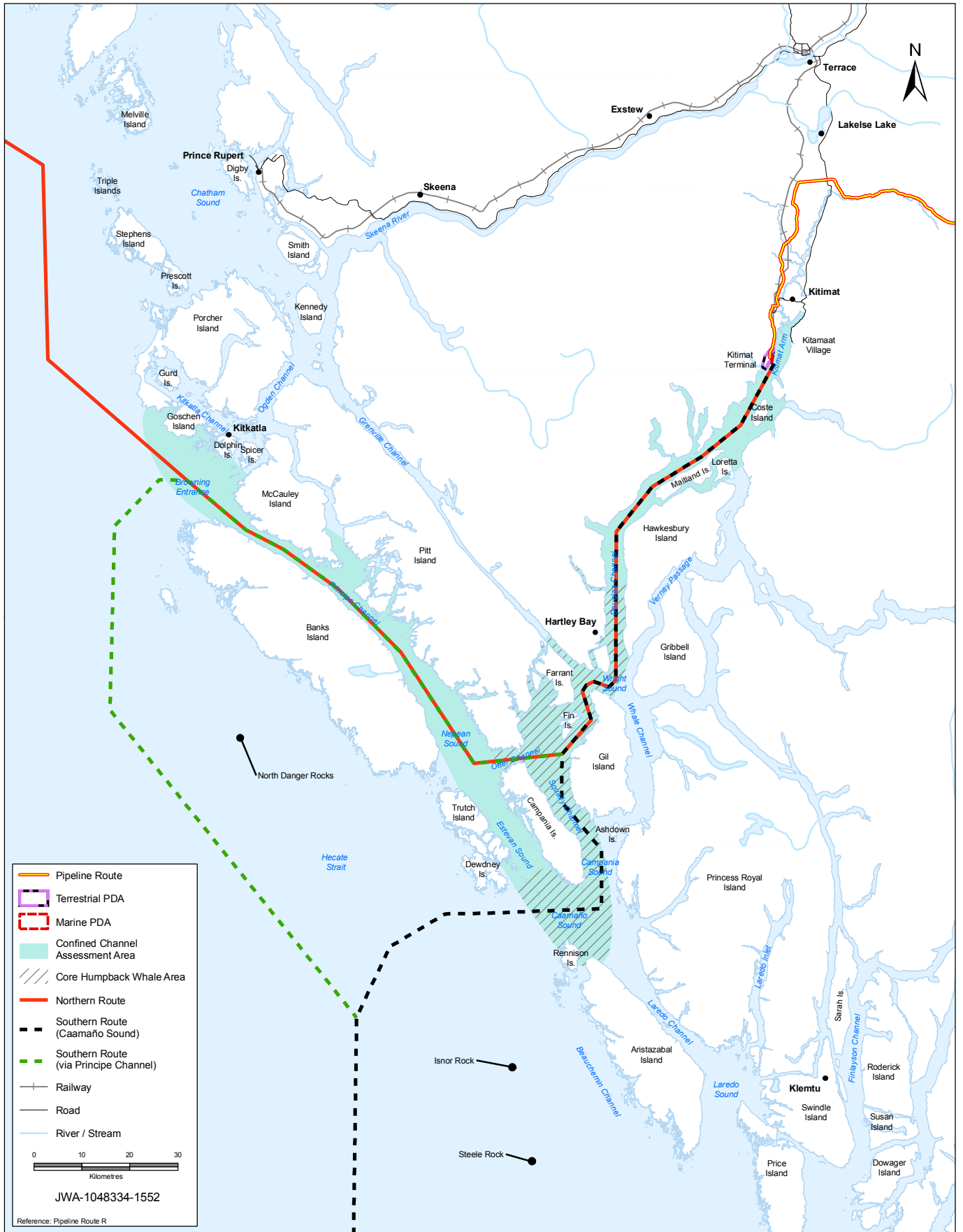
Following the approval of the Project, the draft MMPP will be developed and submitted to DFO for initial review and approval. Northern Gateway, in collaboration with appropriate regulatory agencies, will engage participating Aboriginal groups and other interested stakeholders (e.g., CAB) for guidance on refining aspects of the MMPP (e.g., details of the marine mammal monitoring program). The final document will be submitted to DFO six months prior to the start of operations of the Kitimat Terminal.

Data collected through the MMPP would be used as part of an adaptive management program to identify any required changes in Project Operations and/or environmental management approaches and on-going monitoring strategies. As such, the MMPP will be a living document that may go through multiple iterations over the life of the Project.



## 8      **Figures**

Please see the following page.



REFERENCES: NTDB Topographic Mapsheets provided by the Majesty the Queen in Right of Canada, Department of Natural Resources. All rights reserved.

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## ENBRIDGE NORTHERN GATEWAY PROJECT

### Confined Channel Assessment Area and Proposed Routes

PREPARED BY:



PREPARED FOR:



FIGURE NUMBER:

1

DATE:

20090914

SCALE:

1:1,100,000

AUTHOR:

NP

APPROVED BY:

CM

PROJECTION:

UTM 9

DATUM:

NAD 83

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