Enbridge Northern Gateway Project Joint Review Panel

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Written Evidence in the Matter of

Enbridge Northern Gateway Project

Submission of

Fisheries and Oceans Canada

and

Canadian Coast Guard

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Part I

Submission of

Fisheries and Oceans Canada

1 DFO GENERAL DISCUSSION

1.1 Introduction

1 Fisheries and Oceans Canada (DFO) presents this evidence to the Enbridge Northern Gateway Project Joint Review Panel (the Panel) for the environmental assessment of the Enbridge Northern Gateway Project (the Project) as proposed by Northern Gateway Pipelines Inc. (the Proponent) in accordance with the *Canadian Environmental Assessment Act* (CEAA) and the *National Energy Board Act*.

2 DFO's evidence is based on a review and analysis of the information available as of November 24, 2011, including:

- Environmental Impact Statement (EIS),
- Technical Data Reports, and
- Responses to Information Requests (IRs).

DFO notes that any future information or analysis filed by the Proponent will need to be reviewed and may require modifications to material contained in this submission.

3 This submission is intended to provide context for DFO's involvement in the review of the Project and to convey to the Panel, the Proponent and other interested parties DFO's analysis of the potential impacts to fish and fish habitat that may be caused by the Project. This submission is also intended to highlight areas where the Proponent might be able to improve the information it has provided to the Panel.

1.2 DFO's Mandate, Responsibilities and Guiding Legislation

4 The *Constitution Act* provides the federal Government of Canada with exclusive authority for sea, coastal and inland fisheries within Canada's territorial boundaries. The Government of Canada has made special arrangements by which day-to-day management of certain inland fisheries has been delegated to the provincial governments of British Columbia and Alberta; however, the Minister of Fisheries and Oceans remains responsible to Parliament for all provisions of the *Fisheries Act* to deliver programs and services that support sustainable use and development of Canada's waterways and aquatic resources. The Minister of Fisheries and Oceans is also responsible for the administration of the Canadian Coast Guard.

5 Further, on behalf of the Government of Canada, DFO is responsible for developing and implementing policies and programs in support of Canada's scientific, ecological, social and economic interests in oceans and fresh waters. DFO's mission includes providing

for safe and accessible waterways, healthy and productive aquatic ecosystems, and sustainable fisheries and aquaculture.

6 DFO fulfils its responsibilities through, among other activities, administration of the *Fisheries Act,* the *Oceans Act,* some aspects of the *Species at Risk Act* (SARA), and CEAA (Appendix A).

1.2.1 Fisheries Act

7 There are two types of habitat provisions in the *Fisheries Act*: habitat protection and pollution prevention. The main focus of the regulatory activity of the Department's Habitat Management Program is section 35 of the *Fisheries Act*. Nevertheless, all the habitat protection provisions must be considered when reviewing the negative effects of a proposed project on fish habitat. Additional sections of the *Fisheries Act* that frequently apply to project proposals are sections 20, 22, 30, 32, and 36(3). Section 32 and subsections 22(1), 22(2), 22(3), and 35(2) are listed in *Law List Regulations* enacted under CEAA and, if applicable to a proposed work or undertaking, would trigger an environmental assessment under CEAA. Each section is discussed briefly below.

Section 35

8 Subsection 35(1) is a general prohibition of harmful alteration, disruption or destruction (HADD) of fish habitat. This means that any work or undertaking that results in HADD is a contravention of subsection 35(1). The only relief from this general prohibition is when a subsection 35(2) authorization is issued for the HADD. It is important to note that a subsection 35(2) authorization authorizes the HADD and not the project resulting in the HADD. A project does not need a subsection 35(2) authorization to proceed. However, if a HADD results and an authorization was not issued, the proponent may be guilty of an offence.

Section 20

9 Section 20 deals with fish passage around obstructions and two subsections dealing with fishways. According to subsection 20(1) the owner/occupier must provide for the safe passage of fish around an obstruction. DFO has the option to include section 20 requirements within a subsection 35(2) authorization.

Section 22

10 This section is for the provision of minimum flow below obstructions. Subsection 22(1) requires sufficient flow over the spill way or crest of an obstruction for the safe descent of fish. Subsection 22(2) requires the owner of an obstruction to provide sufficient flow

for free upstream and downstream passage of fish during the construction of an obstruction. Subsection 22(3) requires sufficient flow downstream of an obstruction to provide enough water for fish spawning and egg incubation.

Section 32

11 Section 32 prohibits the unauthorized killing of fish by means other than fishing. This section normally applies to the detonation of explosive in or near water to kill fish. DFO's *Guidelines for the Use of Explosives In or Near Water* (1998) provide information to proponents who are proposing works or undertakings that involve the use of explosives in or near Canadian fisheries waters, and to which sections 32 and 35, in particular, may apply. DFO has the option to include section 32 requirements within a section 35(2) authorization.

Section 36

12 Subsection 36(3) prohibits the deposit of deleterious substances in water frequented by fish. Environment Canada is responsible for administering this subsection. Unlike subsection 35(2), there is no provision to authorize the deposit of deleterious substances except by Regulation or an Order in Council. A deleterious substance is defined by the *Fisheries Act* as any substance that, if added to water, makes the water deleterious to fish or fish habitat.

1.2.2 Oceans Act

13 Under the *Oceans Act,* the Minister of Fisheries and Oceans has the lead responsibility to develop and implement a national strategy for the management of Canada's estuarine, coastal and marine ecosystems. Canada's Oceans Strategy of 2002 (Appendix B) outlines how the *Oceans Act* will be implemented. Canada's Oceans Action Plan of 2005 (Appendix B) articulates a government-wide approach to seize opportunities for sustainable development and further builds upon the legislative and policy framework of the *Oceans Act* and Canada's Oceans Strategy. Canada's Oceans Action Plan serves as the overarching umbrella for coordinating and implementing oceans activities, and as a framework to develop and manage Canada's oceans under the principles of sustainable development.

1.2.3 Species at Risk Act (SARA)

14 SARA is intended to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from being extirpated or becoming extinct; to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and to manage species of special concern to prevent them from

becoming endangered or threatened. The Minister of Fisheries and Oceans is the competent minister for listed aquatic species that are fish (as defined in section 2 of the *Fisheries Act*) or marine plants (as defined in section 47 of the *Fisheries Act*).

15 Species listed as threatened or endangered benefit from several provisions under SARA. Individuals are protected from harm, harassment, killing, take and trade by a series of general prohibitions [subsections 32(1) and 32(2)]. Species' residences and critical habitats, once identified, are also protected from destruction (sections 33 and 58). Additionally, the federal government is required to undertake recovery and action planning activities and to report on progress towards meeting recovery objectives every five years until they are met (sections 37-46 and 47-55).

16 Although listed threatened, endangered and extirpated species are protected against harm under subsection 32(1), the Minister of Fisheries and Oceans may enter into an agreement or issue a permit authorizing a party to engage in activities affecting a listed wildlife species, any part of its critical habitat or the residences of individuals (section 73). Use of section 73 is guided by pre-conditions that specify when the Minister may issue such a permit or enter into an agreement [subsection 73(3)].

1.2.4 Canadian Environmental Assessment Act (CEAA)

17 When DFO proposes to make a regulatory decision under certain provisions of the *Fisheries Act* identified in the *Law List Regulations* promulgated under CEAA, DFO is generally required to ensure that an environmental assessment under CEAA is conducted and is considered a Responsible Authority for the purposes of that assessment. In respect of this Project, DFO may take decisions to issue authorizations under subsection 35(2) of the *Fisheries Act* for HADD of fish habitat and under section 32 of the *Fisheries Act* to permit destruction of fish by means other than fishing. Both of these regulatory provisions are listed in the Law List Regulations and therefore "trigger" the requirement to conduct an environmental assessment under CEAA. Decisions under these provisions of the *Fisheries Act* will not be taken until after the federal response to the Panel's report has been approved by the Governor in Council and been made available to the public.

1.3 DFO's Key Policies, Frameworks and Strategies

18 DFO has developed a number of policies, guides, and operational manuals to assist in ensuring a consistent framework is applied in the review of development proposals. Together they provide a basis for DFO's review of the proposed Enbridge Northern Gateway Project.

1.3.1 The Policy for the Management of Fish Habitat

19 DFO's Policy for the Management of Fish Habitat (the Habitat Policy), introduced in 1986 (Appendix B), provides general guidance on the application of the habitat protection provisions of the *Fisheries Act* and a comprehensive framework for the management of Canada's fish habitat resource base in the context of sustainable development.

20 The objective of the Habitat Policy is to increase the natural productive capacity of habitats for the nation's fisheries resources to benefit present and future generations of Canadians. Productive capacity is defined in the Habitat Policy to mean the maximum natural capacity of habitats to produce healthy fish, safe for human consumption, or to support or produce aquatic organisms upon which fish depend.

21 A key principle of the Habitat Policy is to strive for No Net Loss (NNL) of the existing productive capacity of fish habitat. The NNL principle is applied on a project-by-project basis. Proponents achieve NNL by offsetting HADD of fish habitat through habitat compensation. However, the use of compensation to achieve NNL should only be considered after it proves impossible or impractical to avoid HADD through project relocation, redesign, or mitigation. Should it be determined that a HADD of fish habitat is unavoidable, DFO determines whether an authorization under subsection 35(2) can be issued. The decision to authorize a HADD will follow a review of a fish habitat compensation plan and an effective monitoring plan. It should be noted that for the purposes of an environmental assessment under CEAA, "mitigation" includes both mitigation and compensation (offsetting) while, under the Habitat Policy, mitigation serves to avoid or lessen a HADD, while compensation occurs to offset a HADD.

22 When determining the acceptability of compensation measure DFO takes into account not only the stock management (e.g., commercial, recreational and/or Aboriginal) objectives set by various federal or provincial agencies, but also ecological and/or biodiversity objectives that may be established in a particular watershed, waterbody or geographic area. This includes considering traditional ecological knowledge and/or any spiritual or ceremonial requirements for the resource.

23 Another consideration in determining the acceptability of compensation measures is the certainty or likelihood of success in achieving NNL of productive capacity. This includes an evaluation of the feasibility, practicality and risks associated with the compensation options including the extent of monitoring and adaptive management that may be required in order to ensure the greatest probability of success.

24 The Habitat Policy emphasises integrated resource planning and review of project proposals on an ecosystem basis, taking into account DFO's or the relevant province's Fish Habitat Management Plans and/or Integrated Fisheries Management Plans where

they exist. DFO's Integrated Fisheries Management Plans are developed, for example, to manage the fishery of a particular species in a given region.

1.3.2 Risk Management Framework, Review Process and Policy Application

25 DFO's Habitat Risk Management Framework (see DFO's Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff, Appendix B) was developed to establish a structured approach to decision-making using a common set of tools. The framework is made up of three components which include Aquatic Effects Assessment, Risk Assessment, and Risk Management. An overarching principle which applies to all components of the Habitat Risk Management Framework is risk communication. Effective communication enables proponents and other stakeholders to understand the potential risks development activities pose to fish and fish habitat and the methods to avoid or minimize the risk to acceptable levels.

26 For any project proposal, DFO works with proponents to avoid impacts through relocation of activities away from fish habitat, redesign of a project component, or through the use of Regional Operational Statements that provide guidance on how to avoid impacts. DFO has a number of Operational Statements that can be applied for pipeline construction and related activities, including crossing watercourses through methods such as directional drilling, punch and bore, and dry open-cut, as well as statements for overhead line construction (Appendix B).

27 Should the need for some potentially impacting activities be unavoidable, the next step in the Aquatic Effects Assessment is to identify the potential Pathways of Effects (POEs) or activities proposed that may cause a HADD. DFO has identified and published many key POEs for both land and water based activities.

28 Not all activities have established POEs, and some must be modified somewhat to apply to a given activity or industry such as pipeline construction. DFO has worked with the Canadian Association of Petroleum Producers (CAPP) to develop the guidelines for Pipeline Associated Watercourse Crossings (CAPP 2005), which are updated from time to time. This document contains comprehensive guidance on how to approach stream crossings in a risk management basis similar to and compatible with DFO's.

29 Following the identification of the POE and the application of mitigation, should any residual impacts remain, DFO will conduct the risk assessment. DFO uses the scale of negative effect (extent, duration, and intensity) and the sensitivity of fish and fish habitat (species sensitivity, species dependence on habitat, rarity, and habitat resiliency) to arrive at a risk classification. The Risk Assessment Matrix incorporates these two factors in order to characterize the level of risk the development proposal poses to the productive capacity of fish habitat. The rationale used to locate the residual effects on

the matrix forms the basis for decision-making, but acknowledges that sources of uncertainty exist in any assessment.

30 The end goal of the Habitat Risk Management Framework is to characterize the risk presented by any given project proposal into non-discrete categories from low to high and to manage that risk. The Risk Assessment Matrix provides an effective means through which to communicate the management decisions to proponents and other stakeholders. The proponent always retains the option of considering additional mitigation measures including relocation and redesign as means of lowering the risk ranking. The two most common risk management tools are: (1) letters advising proponents of their obligations to protect fish habitat and the means to do so, and (2) *Fisheries Act* authorizations, which also include conditions for monitoring and compensation, and may contain conditions for financial securities. These conditions are generally commensurate with the level of risk associated with the proposed development.

1.3.3 DFO's Habitat Compensation Policy

31 DFO has published guidelines associated with habitat compensation (see DFO's Practitioners Guide to Habitat Compensation, Appendix B) and the CAPP guidelines referred to above also contain pipeline construction-specific guidance for compensation. Habitat Compensation is defined in the Habitat Policy as:

> *"The replacement of natural habitat, increase in the productivity of existing habitat, or maintenance of fish production by artificial means in circumstances dictated by social and economic conditions, where mitigation techniques and other measures are not adequate to maintain habitats for Canada's fisheries resources."* [Page 26, DFO's Habitat Policy, 1986]

32 Determining the risk associated with a given HADD considers the ability of a proponent to provide a technically feasible and scientifically sound compensation proposal with a strong likelihood of success. When compensation is required to achieve NNL, the Habitat Policy provides a Hierarchy of Preferences for compensation proposals. The Hierarchy of Compensation Options is as follows:

1. Create or increase the productive capacity of **like-for-like** habitat in the same ecological unit;
2. Create or increase the productive capacity of **unlike** habitat in the same ecological unit;
3. Create or increase the productive capacity of habitat in a **different** ecological unit;
4. As a last resort, use artificial production techniques to maintain a stock of fish, deferred compensation or restoration of chemically contaminated sites.

33 Several factors are taken into consideration when determining the appropriate amount of compensation. Higher ratios (greater than 1:1) are justified on the basis of uncertainty of success, variance in the quality of the fish habitat being replaced, and recognition of the lag time required for the new habitat to become functional. As selection of compensation options from the lower levels in the hierarchy will decrease the certainty that NNL can be achieved, the replacement ratios will have to be increased.

34 Where existing habitat is enhanced as compensation, it will be recognized that the existing habitat has intrinsic value to be considered when determining the amount of habitat gained through compensation. Only the difference in productive capacity between the “before” and “after” scenarios is considered as compensatory gains.

1.4 The Pacific North Coast Integrated Management Area (PNCIMA) Initiative

35 Canada's *Oceans Act* mandates the development of an integrated management strategy for Canada's oceans. To help implement this mandate, the Government of Canada has established five large ocean management areas (LOMAs) where integrated oceans management plans are being developed and implemented to inform the management of each of these ocean areas. Integrated oceans management is a commitment to coordinated planning and management of human activities while considering all measures necessary for the conservation and sustainable use of ocean resources and the shared use of ocean areas. An integrated ocean management plan will reflect a balanced approach to oceans management with objectives for respecting economic, social, and ecological health.

36 The Pacific North Coast Integrated Management Area (PNCIMA) (Appendix B) is the first LOMA to be established on the west coast of Canada. PNCIMA encompasses the entire Confined Channel Assessment Area (CCAA) of the Project and beyond. A collaborative planning process involving federal and provincial government agencies, First Nations, marine stakeholders, and coastal communities was initiated in 2009 to develop the integrated ocean management plan for PNCIMA. The plan is scheduled to be completed by December 2012.

37 Significant scientific work has been completed that characterizes ecosystem status and trends, marine environmental quality, as well as ecologically and biologically significant areas within PNCIMA (Clarke and Jamieson 2006:1 and 2006:2, Johannessen *et al.* 2007, Lucas *et al.* 2007, PNCIMA 2011). This information could inform the tanker traffic component of the environmental assessment of the proposed Project. Additional reports identifying ecologically and biologically significant areas specifically for near-shore environments within PNCIMA are also being peer-reviewed in early 2012, and will likely be available at the DFO online library in the fall of 2012 .This information may be useful for assessing the terminal component of the Project.

2 THE PROJECT SETTING

2.1 The Pipeline Right-of-Way

38 The pipeline right-of-way (ROW) crosses 996 confirmed watercourses in six major watershed drainages across north-central Alberta and British Columbia, including the North Saskatchewan, Athabasca, Peace, Fraser, Skeena and Kitimat Rivers (EIS, Volume 6A Part 2, Page 11-1).

39 The majority of the watercourses (a total of 669) that will be crossed are fish-bearing. The larger watercourses flow year round while most of the smaller ones are seasonal. They all support fish populations and would therefore be considered to be fish habitat as defined by the *Fisheries Act* subsection 34(1): "*spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes*". Small streams are also important because they fulfill an important ecosystem function for fish by transferring energy, food and nutrients. By maintaining base-flows, they also provide migration routes to valuable spawning and overwintering areas. In addition, they function as seasonal feeding areas.

40 In Alberta, the pipeline crosses through three drainages, the North Saskatchewan, the Athabasca and the Peace, which also extends into British Columbia. In British Columbia, the pipeline crosses an additional three watersheds, the Fraser, the Skeena, and the Kitimat. In the marine terminal area, there are streams that may be impacted that drain directly into Douglas Channel at Kitimat.

41 **North Saskatchewan River:** The Project crosses 33 watercourses in the North Saskatchewan River drainage, most of which are within the Sturgeon River sub-basin. This section of Project has mostly flat terrain associated with boreal forests, agricultural zones and lower gradient watercourses. There are 30 species of fish that occur in the North Saskatchewan River drainage. Sport fish found in the North Saskatchewan River drainage include mountain whitefish, brown trout, rainbow trout, burbot, goldeye, mooneye, lake sturgeon, northern pike, walleye, sauger and yellow perch. There are 12 species with conservation concerns either due to provincial or federal status; these being lake sturgeon, mooneye, sauger, silver redhorse, shorthead redhorse, quillback, northern redbelly dace, pearl dace, finescale dace, river shiner and spoonhead sculpin.

42 **Athabasca River:** The Project crosses 115 watercourses in the Athabasca River drainage. This area of the Project has mostly flat terrain associated with forested and agricultural areas through the Pembina, Paddle and Little Paddle River valleys. There are 25 species of fish found in the Athabasca River drainage. Sport fish found in the Athabasca River drainage include mountain whitefish, brown trout, brook trout, rainbow trout, bull trout, arctic grayling, burbot, goldeye, northern pike, walleye and yellow perch.

There are 6 species with conservation concerns either due to provincial or federal status; these being rainbow trout, bull trout, northern redbelly dace, pearl dace, finescale dace and spoonhead sculpin.

43 **Peace River:** The Peace River originates in north-central British Columbia in the Williston Lake drainage, and has two major dams, the W.A.C. Bennett Dam which created Williston Lake, and the Peace Canyon Dam. The Peace flows generally eastward, eventually draining into the Slave River, the Mackenzie River and finally, the Arctic Ocean. The Project crosses 125 watercourses in the Peace River drainage inside Alberta and an additional 525 watercourses within British Columbia. This section of the Project crosses through a transitional region in Alberta between the foothills and the boreal forests through the Little Smoky, Simonette, Smoky and Wapiti River valleys, the latter of which extends into British Columbia.

44 Moving west across the Peace watershed within British Columbia, the pipeline crosses the extreme terrain of the Rocky Mountains, which is largely undeveloped except for a number of forestry and resource roads. The Murray, Parsnip and Crooked River are the major rivers crossed though this mountainous area. The proposed pipeline (not including proposed access roads) crosses 127 tributaries of the Missinka River watershed.

45 There are 26 species of fish found in the Peace River drainage. Sport fish found in the Peace River drainage include mountain whitefish, bull trout, lake trout, brook trout, rainbow trout, arctic grayling, burbot, northern pike, walleye and yellow perch. Eight species in the Peace River drainage have conservation concerns; these are rainbow trout, bull trout, northern redbelly dace, pearl dace, finescale dace, spoonhead sculpin, largescale sucker and redside shiner. The Arctic grayling population of the Williston drainage, which the Missinka is part of, is red-listed under SARA. Red-listed pearl dace are known to occur in the easternmost part of the province near the Hiding Creek crossing.

46 **Fraser River:** The Fraser River originates at Fraser Pass near Mount Robson in the Rocky Mountains and follows the Rocky Mountain Trench northwest before turning south near Prince George towards Vancouver and the Pacific Ocean. At 1375 km, the Fraser is the longest river in British Columbia, and produces more salmon than any other watershed in the world (Northcote and Larkin 1989: 172-204). The Project proposes to cross 248 watercourses within the Salmon, Muskeg, Stuart, and Nechako drainages. Twenty-five species of fish, including two SARA-listed populations of white sturgeon occur in the general project area, including the Nechako River populations of the white sturgeon and the Upper Fraser white sturgeon. Other year-round sport fish species include rainbow trout, the provincially blue-listed bull trout, mountain whitefish, kokanee and the provincially blue-listed Dolly Varden. Within the project area, chinook

and sockeye salmon exist in significant numbers, particularly in the Salmon and Stuart watersheds. All Fraser drainages downstream from the proposed ROW eventually contain salmon. DFO operates the Nadina River sockeye salmon hatchery upstream of Francois Lake which is tributary to the Nechako River.

47 **Skeena River:** The Skeena River is approximately 620 km in length, extending from the Coast mountains in west central British Columbia and draining into the Pacific Ocean near Prince Rupert, British Columbia. The Skeena watershed is a world renowned sport fishing destination, particularly for all five species of Pacific salmon; sockeye, chinook, pink, coho and chum. This system is extremely productive for fish, owing in part to the limited amount of development in the lower watershed. The Skeena River is the second largest producer of sockeye salmon in British Columbia, after the Fraser River. A total of 28 fish species are found within the watershed, and in addition to salmon, sport fish such as rainbow and cutthroat trout, steelhead (sea-run rainbow trout), mountain and pygmy whitefish, Dolly Varden, bull trout, and kokanee (landlocked sockeye) can be found in relative abundance.

48 Major tributaries include the Bulkley, Babine, Morice, and Zymoetz rivers. Within the Skeena watershed 279 crossings are proposed. Due to the varied fish species and abundant distributions, many watersheds lack a least risk period. DFO and others operate numerous fish hatcheries in the Skeena system for all five species of salmon, as well as steelhead. The largest facilities are on the Babine system and include the Pinkut sockeye hatchery, and the Fulton River hatchery, which is the world's largest sockeye spawning channel, where as many as a half million sockeye return to spawn. All proposed crossings are downstream of these two hatcheries, but all salmon returning to these hatcheries pass the proposed pipeline crossings.

49 **Kitimat River:** The Kitimat River is a coastal watershed draining into the ocean near Kitimat, BC. As a coastal river, it has numerous direct and indirect tributaries with significant flow. While only 98 km in length, it contains nine distinct watersheds and has 219 watercourses that the pipeline proposes to cross. It can be characterized by a broad wet basin, at the edge of a steep mountain range. Consequently, the numerous streams with direct connection to the Kitimat or its nine major tributaries are abundant with fish in the lower reaches, but the upper reaches of streams tend be high gradient with little fish access. The 219 crossing locations are primarily in the lower reaches of the valley, with the exception of the Hoult Creek watershed. Within the Kitimat watershed, 17 species of fish can be found, including all five species of Pacific salmon, steelhead, Dolly Varden, rainbow and cutthroat trouts, and reportedly, kokanee. DFO operates the Kitimat Hatchery, which produces chum, coho, chinook, steelhead and cutthroat trout. The hatchery contributes to the commercial fishery in Area 6.

2.1.1 Freshwater Fisheries

50 As noted earlier DFO has delegated the management of freshwater recreational fisheries for anadromous fish to the provinces, and it is anticipated that the provinces of Alberta and British Columbia will submit their evidence relevant to those fisheries to the Panel. However, DFO still manages the recreational and aboriginal fisheries for anadromous or sea-going species, including most salmonids and sturgeons, and retains its legislated mandate to protect fish and fish habitat. DFO's fisheries management responsibilities tend to increase as the Project moves west, out of the Arctic Ocean watersheds across the continental divide and into the Pacific Ocean watersheds.

51 In the EIS, the freshwater fisheries is briefly discussed in Volume 6A, Section 11.6.3.1. In order of preference, the top three target fish in British Columbia are rainbow trout, freshwater salmon and cutthroat trout. In Alberta, the top three target species are walleye, northern pike and perch. The EIS provides brief information on recreational catches in the provinces. As noted above, west of the Great Continental Divide, DFO manages recreational and Aboriginal fisheries for anadromous species in the Fraser, Skeena, and Kitimat River systems. The two key management regions are region 6 (Skeena) and region 7 (Omineca-Peace).

52 While the majority of Fraser River salmon are harvested in the lower Fraser and the ocean, a significant First Nations food, social and ceremonial (FSC) fishery exists in the upper Fraser, Nechako and Stuart basins in proximity of the proposed pipeline. According to a 2010 interim report of the Department on mid and upper Fraser River First Nations post-season salmon harvests, approximately 15,400 sockeye and chinook were harvested for FSC purposes (DFO 2011a).

53 Within the Skeena basin, sockeye salmon have been harvested by First Nations for approximately 5000 years (DFO 1999). Approximately 17 First Nations communities harvest an average total of 100,000 to 150,000 fish per year, with a record of 785,000 fish being taken for FSC purposes in 2000 (DFO 2003).

2.2 The Marine Terminal and Associated Vessel Traffic

54 The EIS provides a description of the Kitimat Marine Terminal location, including fish and fish habitat (Volume 6B, Section 3). The terminal is located within Kitimat Arm, which is fed primarily by the Kitimat River. Kitimat Arm averages 3 km across and is approximately 20 km long. Kitimat Arm merges with Douglas Channel just southwest of the proposed terminal and they together form a typical north coastal fjord, roughly 90 km long with steep coastlines. Douglas Channel opens into Queen Charlotte Sound and finally the Pacific Ocean.

55 Kitimat Arm exhibits strong estuarine processes, with a well developed relatively freshwater layer building in the summer, but well mixed through the winter. Mean tidal range is 4.3 m with a maximum near 6.5 m during spring tide and a minimum of 3 m at neap tide. Kitimat River historically provided close to half of the sediment that is annually deposited within Kitimat Arm.

56 The area around the marine terminal location is composed of five main foreshore habitat types: (1) rock wall and ramp, (2) boulder beach, (3) sand and cobble beach, (4) estuarine, and (5) marine riparian vegetation. The intertidal habitat at the marine terminal consists largely of a silt veneer over steeply sloping bedrock. Intertidal habitat within Kitimat Arm contains a mix of bedrock, boulder, soft bottom, and estuaries.

57 Driven by continual freshwater and associated nutrient input and sea water exchange process, fjords and their estuaries tend to be highly productive ecosystems supporting a diversity of aquatic species. Marine and estuarine species are described in Volume 6B, Sections 3 and 10 of the EIS, the Marine Risk Assessment Technical Data Report and in greater detail in the Marine Fish and Fish Habitat Technical Data Report. The Kitimat River, its tributaries and its estuary provide spawning and rearing habitat for five species of Pacific salmon (sockeye, chinook, coho, chum and pink salmon), and for steelhead and eulachon. Bish Creek and many other smaller streams contribute to freshwater input and nutrients throughout the length of the fjord, and also provide spawning and soft bottom estuarine rearing areas.

58 Kitimat Arm supports myriad species of marine mammals, fish, shellfish and other invertebrates. SARA-listed marine mammals (killer whale, humpback whale, Dall's porpoise, harbour porpoise, and Stellar sea lion) and fish (boccaccio and green sturgeon) are likely to occur within Kitimat Arm. Fin whale and grey whale were not observed during the EIS baseline assessments, but may occur intermittently.

59 Marine flora within Kitimat Arm is also comprised of a diverse species assemblage. Marine eelgrass and kelp beds have been identified as major habitats vital to the overall health of the marine ecosystem in British Columbia. Both species are found in scattered locations throughout Kitimat Arm.

60 Species and habitat diversity increases in the open waters assessment area. The number of SARA-listed species in Kitimat Arm is 11 and up to 17 in open waters. Additional SARA-listed species include: blue whale, North Pacific right whale, sei whale, sea otter, leatherback sea turtle, abalone, soupfin shark, bluntnose shark, rougheye rockfish and longspine thornyhead. Rockfish species present within the open water assessment area that are at various stages of SARA listing/recovery planning include yellow eye, quillback, darkblotched, and canary.

2.2.1 Marine Fisheries

61 The Technical Data Report on Marine Fisheries describes the marine fisheries in the Project Development Area (PDA), Project Effects Assessment Area (PEAA) and CCAA. The commercial, aboriginal and recreational marine fisheries within Kitimat Arm, Douglas Channel and in Hecate Strait are entirely within DFO Fisheries Management Area (FMA) 6. Principe Channel and Browning Entrance to the north are within DFO FMA 5. The commercial and aboriginal fisheries primarily target Pacific salmon, Pacific halibut, prawn, red sea urchin, octopus, crab and a variety of groundfish. Groundfish species typically fished for include hake, two species of skate, Pacific cod, four species of sole, dogfish, lingcod, 16 species of rockfish, pollock, flounder, and sablefish. Other fisheries are directed at Pacific herring (food and bait, and roe and spawn on kelp), geoduck, sea cucumber, shrimp, and horse clam. The following paragraphs summarize data provided by the Proponent in the Technical Data Report on Marine Fisheries.

62 Salmon are commercially targeted with gill nets and purse seines and to a limited extent by trolling. Groundfish are primarily harvested by long lining or trawling. Octopus is generally caught as bycatch in trawls and traps targeting prawns and other species.

63 Commercial landings of salmon in subareas of FMA 5 and 6 between 2000 and 2008 accounted for 32.4 million kg or about 14.5% of the British Columbia total. The value of the commercial salmon fishery over the same years ranged from approximately $100,000 to over $9 million.

64 Total commercial landings of halibut in subareas of FMA 5 and 6 between 1998 and 2008 was approximately 1.1 million kg and contributed up to 2.3% of the total British Columbia landings between 1998 and 2008. The maximum value of the halibut fishery over those years was approximately $1.3 million.

65 The average value for the prawn fishery in FMA 5 and 6 between 1998 and 2008 was approximately $1.3 million and represented less than 4% of the total British Columbia landings. The average value for the red sea urchin fishery between 1998 and 2008 was approximately $1.4 million and represented more than 65% of the total British Columbia landings. Commercial octopus landings between 1998 and 2008 accounted for greater than 90% of the total British Columbia landings. The value of the octopus fishery is generally less than $100,000 but has exceeded $900,000. Approximately 385,000 kg of Dungeness crab was landed between 1998 and 2008, representing less than 2% of the total British Columbia landings. The maximum value of the Dungeness crab fishery was approximately $400,000.

66 Groundfish landings in FMA 5 and 6 account for less than 1% of the total British Columbia groundfish fishery. The maximum value of the groundfish fishery within subareas of FMA 5 and 6 from 1998 to 2008 was approximately $1.2 million. The maximum value of the Pacific herring food and bait fishery from 1998 to 2008 was

approximately $2.8 million. The Pacific herring roe and kelp spawn fisheries maximum reported value was approximately $1.9 million. Between 1998 and 2008, the value of the geoduck fishery in FMA 5 varied from less than $1,000 in 2001 to $8,662,000 in 2005. Between 1998 and 2008, the landed value of the commercial geoduck harvest in FMA 6 peaked in 2005, the same year as in FMA 5 with a value of $7,006,412.

67 The average value for the sea cucumber fishery between 1998 and 2008 was approximately $340,000 and represented greater than 40% of the total British Columbia landings. The fisheries for shrimp and horseclams combined typically yield less than $400,000 annually.

3 PROJECT REVIEW AND RISK ASSESSMENT

3.1 DFO's Approach to Analysis and Assessment

68 In reviewing the Project, DFO has divided the components of the proposal into the two aquatic regimes, freshwater and marine, and applied the Department's Habitat Risk Management Framework as described in Section 1.3.2 of this submission. Sections 3.2 and 3.3 of this submission focus on these regimes and identify the key POEs, consider the proposed mitigation, comment on the Proponent's risk assessment and, where possible, provide recommendations for actions the Proponent might undertake to further reduce or eliminate impacts to fish and fish habitat.

69 DFO's review of the EIS and supporting information for the Project identified a number of areas of uncertainty, and DFO has assessed the relative impact of this uncertainty on the risk ratings resulting from the application of the Department's Habitat Risk Management Framework. The key areas of uncertainty identified by DFO are:

- Incomplete or dated information regarding pipeline stream crossings;
- Whether pipeline route may be subject to change by the Proponent;
- The extent of the HADD(s) of fish habitat is undefined; and
- A strategy to compensate for lost habitat that is sufficiently developed to evaluate its feasibility and likelihood of success (as this has yet to be provided by the Proponent).

70 The Proponent has provided processes or methods to address some of the above areas of uncertainty (notably with respect to stream crossings) and has an opportunity to, through commitments or future supplements to the EIS, mitigate or eliminate other areas of uncertainty (e.g., through the preparation of fish habitat compensation plans). One key area of uncertainty not addressed in some way (or that cannot be addressed at this time) is the final pipeline routing.

71 DFO notes that prior to issuing authorizations under the *Fisheries Act*, DFO would need sufficient time to review and, where necessary, undertake consultations with First Nations related to DFO's final understanding of the nature and magnitude of impacts. Should any new information that is provided, after the conclusion of the environmental assessment, identify a HADD that was not already considered, a new environmental assessment may be required.

3.2 Freshwater Fish and Fish Habitat Risk Assessment

3.2.1 Pathways of Effects

72 For any given pipeline construction, DFO can identify broad categories of activities and associated POEs likely to pose a risk to fish and fish habitat. Typically these would include the pipeline stream crossings and, in particular, the proposed crossing method, as well as the riparian vegetation clearing associated with the ROW. The associated POEs would potentially include the use of industrial equipment in the riparian zone as well as instream, loss of riparian vegetation and function, vehicle fords, sediment inputs, diversion and/or reduction of instream flow, alteration of the stream bed, and new or improved public access to fishing grounds.

73 The EIS identifies and describes POEs for the pipeline construction and associated ancillary activities (Volume 6A, Appendix 11A, and Table 11A1). The table lists activities, expected POEs, direct effects of the activity (e.g., riparian vegetation loss) and secondary or "ultimate" effects to habitat (e.g., change in habitat structure). The table is broadly comprehensive and seems likely to anticipate the majority of POEs and correctly links them to effects. DFO is of the opinion that the Proponent has provided sufficient information for this portion of the Department's Habitat Risk Management Framework.

3.2.2 Mitigation Measures

74 Mitigation measures are described in the EIS in Volume 6A, Section 11. The EIS provides activity-specific mitigation measures for several activities, such as sediment inputs, riparian impacts and habitat structure and cover. Table 11.18 links mitigation to environmental effects resulting from an activity (e.g., trenched and trenchless watercourse crossings), and provides a prediction of its likely success. Both the text and the table are, in DFO's opinion, a good approach that would benefit from the inclusion of more activities (e.g., road and powerline crossings), linking mitigation to specific POEs and expanded descriptions of the mitigation. It should also be noted that the Proponent has undertaken many route revisions, often for fisheries related reasons (Volume 6A, Table 11.3), and has committed to using DFO's Operational Statements where they apply.

75 The Proponent's general approach to mitigating the potential impacts of pipeline crossings appears sound, but information on powerline and road crossings is lacking. The EIS indicates that 188 road crossings will be required, and suggests that DFO's Clear Span Bridges Operational Statements will be applied. These Operational Statements contain conditions for applicability and the Proponent will need to ensure that the Operational Statements apply in each circumstance that the Proponent intends to rely on them. The Proponent also proposes to rely on DFO's Operational Statements applicable to powerline construction. The Operational Statement for British Columbia has conditions for applicability and the Proponent will need to ensure that the Operational Statement applies to all powerline crossings in British Columbia.

76 Working within Least Risk Periods (LRPs) identified by DFO and the relevant province is a method of mitigating adverse impacts to fish while working instream, often including avoidance of a HADD. It is the expectation of DFO that all works will be conducted within the LRP. Requests to conduct works outside these windows (or where LRPs do not exist) will be reviewed on a case-by-case basis, and will require justification.

77 DFO recommends that the Proponent provide an additional and/or, where necessary, revised table that identifies mitigation measures for potential impacts to fish and fish habitat associated with all activities related to construction and operation of the pipeline, road and powerline crossings.

3.2.3 Risk Ranking

78 In the EIS, the Proponent has proposed to use a risk management framework (Volume 6A, Section 11.5 and Appendix 11C), which is based on the Department's Habitat Risk Management Framework, to classify risks into high, medium or low. The classifications arrived by the Proponent are used to evaluate the potential for and nature of any HADDs resulting from primary and contingency stream crossing methods proposed. The Proponent has also refined DFO's Risk Assessment Matrix to select crossing techniques. This approach of using the risk management framework and refined matrix is intended to allow for a consistent, risk-based decision-making process and can be used to identify and quantify likely impacts in advance of final design stage. The approach is flexible enough to be updated as new data becomes available and, from DFO's perspective, appears to be suitable for most pipeline crossings.

79 In order to manage the risks associated with a particular crossing, the Proponent may select from among the three main categories of stream crossings construction methods: trenchless, isolated, and open-cut (for a full description, see CAPP 2005). Typically, the trenchless crossing method has the lowest risk to fish and fish habitats and the open-cut crossing method has the greatest risk to fish and fish habitats. The choice of method depends on the application of DFO's Habitat Risk Management Framework.

80 Based on the analysis the Proponent provides using its risk management framework for pipeline crossings, the EIS (Volume 6A, Section 11.5.3.1) identifies 132 high-sensitivity watercourse crossings (102 in British Columbia and 30 in Alberta) and 178 moderate-sensitivity watercourse crossings (145 in British Columbia and 33 in Alberta). The Proponent states the remaining watercourse crossings (241 in BC and 111 in Alberta for a total of 359 pipeline crossings) are low risk and would not cause HADDs after mitigation measures are applied. This data is inconsistent with the data provided in Table 1 of Northern Gateway Response to Federal Government IR No. 2, Response #2.9) which, using a worst-case scenario approach, identifies only 96 watercourse crossings that the Proponent classifies as high and medium risk crossings that would cause a HADD. A clarification is necessary.

81 DFO has identified some examples where crossings of important anadromous fish habitat have received a lower risk rating using the Proponent's framework than DFO would have assigned. In addition, DFO has identified some instances where the proposed crossing method could be reconsidered to better reflect the risk rating.

82 There are a number of proposed crossings locations where field survey was not conducted by the Proponent. More specifically, no field data has been provided for evaluating risks for 136 crossings (Northern Gateway Response to Federal Government IR No. 2, Response #2.11). For the crossings for which field data is unavailable, the Proponent relied on published information or extrapolated from public data for nearby sites. Predictions made by the Proponent regarding the risk rating for some streams may need to be changed depending on future collection of data and any route revisions.

83 The Proponent, in arriving at its risk ranking, has used a 15 m buffer zone from centerline of watercourse. The buffer zone is appropriately determined from the high water mark and, depending on the sensitivity of the watercourse, DFO may recommend using a 30 m buffer zone from the ordinary high water mark.

84 Notwithstanding the above limitations, the Proponent's approach to categorizing watercourse crossings based on levels of risk is similar to and compatible with DFO's approach to risk management. DFO also notes that the Proponent has previously identified and redesigned high-risk crossings with lower risk construction options or alignments to decrease the risk to fish and fish habitat.

3.2.4 Fish Habitat Compensation

85 The EIS communicates the Proponent's intention to provide fish habitat compensation where residual impacts remain after mitigation measures are implemented (Volume 6A, Section 11 and Appendix 11B). The Proponent commits to achieving NNL by providing habitat compensation in accordance with the hierarchy of preferences set out in the Habitat Risk Management Framework. In addition, in its response to the Federal

Government's IR No. 2 (Response #2.8a), the Proponent has committed to completing the development of a more comprehensive draft fish habitat compensation plan for both freshwater and marine habitats for review and input by DFO and participating Aboriginal groups in early 2012 or mid-2012.

86 DFO notes that subsection 16(1)(d) of CEAA requires that the environmental assessment include a consideration of "*measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the proposed project*." Mitigation is defined in CEAA as "*the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means*." As such, a fish habitat compensation plan would be considered mitigation pursuant to CEAA.

87 DFO encourages the Proponent to continue with developing the compensation plan, and submit it to DFO and the Panel for consideration as mitigation of potential project effects. DFO understands that the Proponent may not be able to provide the final routing details of the pipeline until the final engineering details have been prepared. DFO also understands that such details may only be available after the environmental assessment has been completed. DFO is of the opinion that the plan should be able to clearly indicate how NNL might be achieved, especially considering that many conclusions the Proponent draws regarding cumulative impacts rest upon the assumption of attaining NNL. Including compensation plans in the Panel process would reduce uncertainty and help prevent delays in the regulatory phase of the Project.

3.2.5 Impact on Species at Risk: Nechako and Lake Sturgeon

88 Two Nechako River populations of white sturgeon in Stuart and Endako Rivers in British Columbia are listed under SARA. The Nechako River population of white sturgeon is in a critical state of decline and has dropped from an estimated 5,000 fish to fewer than 500 fish, with most individuals over 30 years old. Both populations and their critical habitats exist upstream and downstream of the proposed crossing locations for these rivers.

89 The lake sturgeon populations in the Saskatchewan River system in Alberta are listed as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and are currently being considered for SARA listing (see Technical Data Report: Freshwater Fish and Fish Habitat). This population faces a variety of threats in Alberta, including over-harvesting and habitat loss from the construction and operation of dams.

90 The EIS identifies that primary stream crossing mitigation measures for species at risk will be the selection of the crossing method and timing of construction works. While the

primary crossing method for the Stuart and Endako River crossings are trenchless (and the Proponent indicates a high level confidence in the successful outcome of the trenchless crossing on Stuart River) the contingency crossing method (which is open cut) for the Endako River has the potential to cause a HADD. Even trenchless horizontal directional drilling crossings cannot completely eliminate risk. One of the risks associated with horizontal directional drilling is the escape of drilling mud into the environment as a result of a spill, tunnel collapse or the rupture of drilling mud to the surface, commonly known as “frac-out”. If drilling mud enters a watercourse, it can cause a HADD.

91 DFO recommends that the Proponent reconsider the contingency crossing method for the Endako River and develop an environmental management and protection plan that includes specific mitigation measures that avoid all harm to the sturgeon population. DFO also recommends that the Proponent identify specific mitigation measures that avoid all harm to the Nechako populations of white sturgeon during construction and operation, or provide an alternative assessment. It will be important for the Proponent to ensure these mitigation measures are sufficient and are implemented to avoid the risk of impacts to sturgeon.

3.2.6 Water Extraction for Hydrostatic Testing and Other Purposes

92 Information describing the scale, timing, and location of water extraction activities for hydrostatic testing and other purposes should be clearly delineated in the EIS, as there are potential effects to fish and fish habitat. The Proponent has committed to limiting surface water withdrawals to those approved by the appropriate regulators. If any of these water extraction activities result in a HADD requiring authorization, these activities would likely be subject to an additional environmental assessment.

3.2.7 Accidents and Malfunctions: Pipeline Oil Spills

93 During the operational life of oil pipelines, a key risk to fish and fish habitat is potential leaks caused by pipeline malfunctions. The EIS indicates that remotely operated pipeline block valves will be installed within the ROW, at pump stations, selected watercourse crossings, and in other locations, based on environmental sensitivity, geotechnical and volume factors, as well as operational and maintenance requirements. The current proposed locations are found in Volume 3, Appendix F of the EIS. The Proponent indicates that valve locations are designed to limit pipeline spills to 2000 cubic meters (2 million litres). A spill of 2000 cubic meters would likely cause acute mortality of fish and other aquatic species. DFO recommends a lower volume threshold be proposed. It is worth noting that the Pine River oil spill in August of 2000 released 1000 cubic meters (1 million litres) and is considered one of the worst inland spills in British Columbia. The severity of impact was due not only to the acute mortality of fish

and other aquatic species, but also to the cleanup effort which resulted in serious and lasting impacts to the habitat and hydrology of the Pine River.

94 DFO recommends that the Proponent reconsider the appropriateness of its intended use/placement of block valves, particularly at all major salmon stream crossings and at all other watercourse crossings that rank as high or moderate risk.

3.2.8 Recommendations – Freshwater Impacts and Mitigation

1. DFO recommends that the Proponent provide an additional or revised table that identifies mitigation measures for potential impacts to fish and fish habitat associated with all activities related to construction and operation in or near freshwater and includes primary and contingency crossing methods (for pipeline, road and powerline crossings). This table will more clearly link mitigation measures with potential impacts and increase the understanding of the appropriateness of proposed mitigation.

2. DFO recommends that the Proponent employ a trenchless crossing method for all stream crossings that have a risk category of medium to high, all stream crossings where there is no LRP and where important anadromous fish habitat occurs. Where the Proponent does not select a trenchless crossing method, DFO recommends that rationale be provided.

3. DFO recommends that the Proponent proceed with its commitment to develop a compensation plan through 2012. DFO also recommends that the Proponent submit draft and final versions to the Panel for its consideration in the environmental assessment.

4. DFO recommends that the Proponent reconsider the contingency crossing method for the Endako River and develop an environmental management and protection plan that includes specific mitigation measures that avoid all harm to the sturgeon population. In addition, DFO recommends that the Proponent identify (and implement) specific mitigation measures that avoid all harm to the Nechako populations of white sturgeon during construction and operation, or provide an alternative assessment.

5. DFO recommends that the Proponent reconsider the appropriateness of its intended use/placement of block valves, particularly at all major salmon stream crossings and at all other watercourse crossings that rank as high or moderate risk.

3.3 Marine Fish and Fish Habitat Risk Assessment

3.3.1 Pathways of Effects for the Marine Terminal Construction and Operations

95 The Kitimat Marine Terminal component includes hydrocarbon tanks and associated pumps and facilities. The operations will consist of tanker berthing and unberthing, mooring and unmooring, loading and unloading, preventive maintenance, and regularly scheduled safety and security inspections and ship clearance procedures. The maximum design loading and unloading rates are reported to be 15,900 m^3/h for oil and 11,100 m^3/h for condensate. As a mitigation measure against any potential diluted bitumen spill during loading, each tanker will be equipped with a containment boom. A containment boom will not be used during loading of condensate.

96 Similar to the pipeline construction, DFO can identify broad categories of activities and associated POEs likely to pose a risk to fish and fish habitat due to the construction and operations of the marine terminal. The potential footprint of the terminal construction and associated activities can be easily located and defined. This footprint would include the terminal site preparation and construction, as well as associated roads, powerlines and pilings. The associated POEs would potentially include the use of industrial equipment in the riparian zone, loss of riparian vegetation and function, blasting, sediment inputs, dredging, pile drilling, and noise. The impacts of the construction and operations of the marine terminal are described in Volume 6B of the EIS, and supported by seven Technical Data Reports. Marine traffic associated with the operations of the port is further described in Volume 8 of the EIS.

97 The EIS identifies and describes the approach taken by the Proponent in Volume 6B, Section 4A.2.2.3. POEs for the terminal construction are further elaborated upon in attachment 4A.1 (Table 4A.1-1, attachment 4A.2 has flow diagrams). The table lists activities, links them to POEs, and then to a predicted range of direct effects of the activity (e.g., riparian vegetation loss) and secondary or “ultimate” effects on habitat (e.g., change in habitat structure). Four categories of habitats are characterized: riparian, inter-tidal, sub-tidal benthic and sub-tidal pelagic.

98 The table is broadly comprehensive and seems likely to anticipate the majority of POEs and correctly links them to effects. DFO is of the opinion that the Proponent has provided sufficient information for this portion of the Department’s Habitat Risk Management Framework. However, DFO recommends that the Proponent provide an additional table that identifies mitigation measures for potential impacts to fish and fish habitat associated with all marine activities related to construction and operations. This table will more clearly link mitigation measures with potential impacts and increase the understanding of the appropriateness of proposed mitigation.

3.3.2 Pathways of Effects of Vessel Traffic

99 There are two types of vessel traffic associated with the Project: barge traffic associated with the construction of the terminal, and tanker traffic associated with its operations. The predicted POEs are identical for both; therefore, they are treated as one and referred to as “vessel” or “tanker” traffic. The POEs for tanker traffic are relatively few and readily identified: the key activity is the traffic itself, or vessel transits through the area in support of construction and operations of the terminal. The POEs identified by the Proponent are the vessel traffic, and the associated noise and wake disturbance. Ultimate effects range from mortality (through ship strikes) to change in behaviour. DFO notes that, for the purposes of its review, the potential for accidents and malfunctions (leading to an oil spill) would be a primary POE as well, and is considered separately under Section 3.3.8 of this submission.

3.3.3 Risk Ranking

100 The EIS provides risk ranking based on habitat sensitivity and scale of negative effects for a range of Project activities, including site grading, dredging, blasting, pile drilling, grouting, use of industrial equipment, surface water runoff, operation of marine vessels for three habitat types—intertidal, subtidal benthic and subtidal pelagic (Volume 6B, Attachment 4A.3). The analysis only identified low to moderate risks; no high risks were identified.

3.3.4 Fish Habitat Compensation Plan

101 A fish habitat compensation plan for the marine habitat loss is not yet available. However, the Proponent has committed to avoiding loss of marine habitat through project design. Where habitat loss is unavoidable, the Proponent has committed to offset loss through restoration, enhancement and/or compensation of HADD of marine fish habitat. The Proponent has committed to compensate for unavoidable HADD using DFO’s hierarchy of preferences to achieve NNL.

102 Potential impacts of marine habitat include permanently lost or altered intertidal and sub-tidal habitat and temporary losses of related productive capacity. The Proponent has committed, through its response to Government of Canada IR No. 2, to provide a marine habitat compensation plan to mitigate potential adverse effects on marine fish and fish habitat resulting from construction of the marine terminal. DFO understands that the Proponent is currently developing a conceptual marine habitat compensation plan that the Proponent will improve through discussions with DFO and participating Aboriginal groups early in 2012.

3.3.5 Mitigation Measures: Marine Terminal Construction and Operations

103 The Proponent describes mitigation measures related to POEs for the construction and operation of the proposed terminal in Volume 6B. The mitigation is identified in sections devoted to larger groups:

- Section 5 - general mitigation for the marine environment;
- Section 8 - marine vegetation;
- Section 9 - marine invertebrates;
- Section 10 - marine fish;
- Section 11 - marine mammals; and
- Section 13 - marine fisheries.

104 Within each section the key POEs are discussed; for instance, blasting, dredging and sediment inputs from shore development are identified for marine invertebrates. Mitigation for each of these is identified, such as safe work windows, a blasting management plan, and potentially a salvage and relocation operation for Dungeness crab should sediment inputs threaten nearby habitat and their survival.

3.3.5.1 Sedimentation, Blasting and Dredging Mitigation

105 The EIS considers sediment inputs from construction activities, including in-water activities such as blasting and dredging, in Volume 6, section 7 and further in the Construction EPMP (Volume 7A, section 11). The impact of noise relating to blasting is further considered in the conceptual Blast Management Plan (Volume 7A, Appendix A). The Proponent commits to undertaking several key mitigation steps and developing plans in consultation with DFO, including silt curtains, timing windows, and stopping activity if a marine mammal enters a danger zone. DFO notes that dredge spoils will be disposed of onshore. DFO also notes, however, that there is extensive literature documenting a wide range of potential physiological (e.g., smolt transformation when adapting to sea water, respiration difficulties due to gill trauma), behavioural (e.g., homing and migratory effects), and habitat (e.g., habitat-related effects on the benthic community and then upwards via the food chain to salmonids) effects of increases in suspended sediments on salmonids. DFO would be willing to provide the Proponent with references to relevant literature. DFO encourages the Proponent to further develop the blasting management plans and sediment monitoring plan in consultation with DFO and other appropriate parties and submit updated versions to the Panel.

106 Cold-water sponges and corals, which are considered “fish” under the *Fisheries Act*, are used by other fish as habitat. As structure-forming species, sponges and corals provide highly complex habitat and are likely to support diverse species communities. Therefore, they represent both fish and fish habitat. Because they are long-lived and

slow-growing, they are highly vulnerable to human activities (Clark and Jamieson 2006). Sedimentation could have detrimental impact on cold-water sponges and corals. Furthermore, the EIS makes it clear that blasting operations will likely result in the mortality of sponges in the vicinity due to falling debris. DFO would note that this will likely require both Section 32 and Section 35(2) authorizations under the *Fisheries Act*, and should be considered in compensation plans.

107 DFO recommends that the Proponent continue with its efforts to characterize distribution, abundance and density (including rarity and uniqueness) of cold-water sponges and corals near the proposed Kitimat Terminal to help provide an accurate characterization of potential impacts of terminal construction.

3.3.6 Mitigation Measures: Marine Transportation

108 The Proponent describes mitigation measures related to POEs for the construction and operation of the proposed terminal in Volume 6B of the EIS. The mitigation is identified in sections devoted to larger groups:

- Section 5 - general mitigation for the marine environment;
- Section 7 - marine vegetation;
- Section 8 - marine invertebrates;
- Section 9 - marine fish;
- Section 10 - marine mammals; and
- Section 12 - marine fisheries.

109 Within each section the key POEs are discussed; for instance, ship strikes for marine mammals. Mitigation for each of these is identified, such as marine mammal observers on board and reduced vessels speeds through important areas for certain species at key times.

3.3.6.1 Ship Strikes

110 The EIS documents and characterizes potential impacts on marine mammals. However, DFO's review has identified areas for possible improvement. These areas are described below.

111 The Proponent's mitigation plan for potential vessel strikes with marine mammals causing serious injury or death of marine mammals includes reducing vessel speed in the CCAA to 10-12 knots generally, and 8-10 knots in the "*humpback whale core area*" during May to November, *"unless otherwise required for safe navigation"* (Volume 8B, Page 10-89 and elsewhere). It is also stated that if whales are located in the path of a tanker transiting the CCAA (Volume 8B, Page 10-10), the *"tanker will be requested to*

reduce speed to the minimum safe level of navigation through the specific area". This speed reduction would presumably be less than the routine 8-10 knots speed in the CCAA.

112 In a report of the International Whaling Commission's (IWC) Vessel Strikes Working Group, it is reported that about 23% of all confirmed vessel strikes causing death or serious injury to whales took place at speeds of 10 knots or less (Van Waerebeek and Leaper 2008). That report also shows that two baleen whale species—the fin whale and humpback whale—are by far the most frequently involved in ship strikes globally. These are SARA-listed species and they occur regularly within the CCAA (Nichol *et al.* 2002, 2009, 2010; Ford *et al*., in prep). Current knowledge of the seasonal distribution and abundance of whales in the CCAA is inadequate to assess the risk of serious injury or mortality to humpback whales and fin whales from ship strikes. The Proponent is engaged in a study that will better describe the spatial and seasonal occurrence and densities of marine mammals in the CCAA and PDA.

113 In response to the Panel's IR 4.31, the Proponent describes the existing knowledge regarding the migration corridor of pacific grey whales in the CCAA and Open Water Area (OWA), taken primarily from DFO's Management Plan for Pacific Grey Whales (DFO 2011b). However, since that Management Plan was prepared, new information has become available which indicates that the primary migration corridor for northbound grey whales is not close to the west coast of Haida Gwaii as originally thought, but is up the east side of Hecate Strait and through Dixon Entrance (Ford *et al*., in review). Grey whales generally migrate within a few kilometres of shore over most of their migration corridor, and this transit of the relatively open waters of Hecate Strait and Dixon Entrance is unusual. Most of the proposed approaches to the CCAA in Hecate Strait as well as the tanker route through Dixon Entrance overlap substantially with this migration corridor. Grey whales are known to be vulnerable to ship strikes (Douglas *et al.* 2008). DFO recommends that the risk assessment of ship strikes in the OWA be expanded to quantify the likelihood of injury or mortality to grey whales during their spring migration through Hecate Strait and Dixon Entrance.

3.3.7 Impacts on Marine Species at Risk

3.3.7.1 Marine Mammals

114 DFO is the responsible authority for aquatic species at risk under SARA. Once an aquatic species is listed as *threatened* or *endangered*, DFO must develop a recovery strategy and action plan for the species and identify and legally protect the species' critical habitat from destruction. Under SARA, all harm, harassment or killing of individuals from a species listed as *endangered* or *threatened* is prohibited. For species that are listed as *special concern* under SARA, DFO must develop a management plan

that includes measures for the conservation of the species and their habitat. There are many elements considered in these plans, including, for instance, noise. High underwater noise levels are known to affect marine mammals in a negative way, by disrupting feeding, breeding, socializing and other critical life processes.

115 The EIS discusses the use of thresholds in the determination of the significance of environmental effects. The EIS indicates that where possible, threshold criteria or standards are identified for each Key Indicator species above which a residual environmental effect would be considered significant (Volume 6B, Section 4).

116 SARA prohibits killing, harming and harassment of individuals from species listed as *endangered* or *threatened* under SARA. The Minister of Fisheries and Oceans may only enter into an agreement or issue a permit authorizing a party to engage in activities affecting a listed wildlife species under SARA section 73 if pre-conditions are met. In particular, the harm to individuals associated with the activity cannot jeopardize the survival or recovery of the species. For some marine mammal species, the loss of a single individual may be detrimental to the survival of the species. With regard to species listed as *endangered* or *threatened*, all killing, harming, harassing of individuals is prohibited. Therefore, it is inappropriate to consider residual environmental effects for such SARA-listed species. Avoidance of harm is required, and where avoidance is not possible, mitigation of harm is required. In cases where there is no scope for allowable harm, the Proponent risks contravening SARA if harm were to result from the Project activities.

117 DFO may set limits to human-induced mortality or allowable harm that is subject to prohibitions in the case of SARA-listed species. The allowable harm for a species is used when considering the issuance of a section 73 permit. For species of special concern, the level of allowable harm is used to guide management decisions and may provide information for the consideration of permits under the Marine Mammal Regulations. Allowable harm has only been determined for Abalone, Sea Otters and Transient Killer Whales to date. These undergo extensive review, taking into consideration data quality and risks, and are only accepted following DFO's Canadian Science Advisory Secretariat review process. Note that these estimates are total impacts from all possible anthropogenic threats for the whole of the Pacific populations.

3.3.7.2 Marine Fish

118 Various populations of eulachon have been assessed as endangered or threatened by COSEWIC and are under consideration for listing under SARA. Eulachon are an anadromous species and are at risk in both marine and freshwater habitats. The EIS does not consider that harm to this species may be subjected to prohibitions within the timeframe of this proposal. More information is required to adequately assess the

proposed project impacts to eulachon at the individual and population level. In addition, if the species is listed, any identified critical habitat would be legally protected under SARA from any harm that may occur during construction or in the event of a spill or malfunction.

119 Quillback rockfish and yellowmouth rockfish have been designated as threatened by COSEWIC and are under consideration for listing under SARA. The primary potential threat to these species and their habitat is from a potential oil spill. The EIS does not anticipate the possibility of the significant likelihood that some or all of these species may be listed under SARA and individuals of these species and their critical habitat, if designated, would then be afforded legal protection from harmful impacts under SARA prior to construction and operation of the Project.

3.3.7.3 Marine Invertebrates

120 At the time of the preparation of the Enbridge Northern Gateway Project submission, northern abalone (abalone) was listed as *threatened* on Schedule I of SARA. Abalone populations have continued to decline and the species is now listed under SARA as *endangered*. The Action Plan for the Northern Abalone (*Haliotis kamtschatkana*) in Canada (proposed) is currently posted on the SARA Public Registry and identifies proposed critical habitat for this species. In addition, all harm to this endangered species is prohibited under SARA, unless permitted under section 73. To ensure that individuals and critical habitat are not harmed during the implementation of any works or developments in, on or under the water that are proposed in areas of northern abalone habitat, the "Impact Assessment Protocol for Works and Developments Potentially Affecting Abalone and their Habitat" (Lessard and Campbell 2007, in: Lessard *et al.* 2007) must be followed. All harm to this endangered species is prohibited under SARA. This protocol is identified as required mitigation for projects in potential northern abalone habitat and can be found as an Appendix to the Action Plan for Northern Abalone (*Haliotis kamtschatkana*) in Canada (proposed). Although DFO agrees with the Proponent that this risk is low due to the lack of quality habitat in the terminal area, it is recommended that an assessment following the protocol be undertaken to ensure SARA compliance.

3.3.8 Accidents and Malfunctions: Tanker Oil Spills

121 The Proponent has conducted an ecological risk assessment, characterized and mapped sensitive habitats, identified sensitive species, proposed response and clean-up plans, committed to further developing those plans in consultation with appropriate regulators and other stakeholders and committed to ensuring that all vessels conform to high standards. DFO encourages the Proponent to further develop these plans and is willing to participate and provide advice as needed.

122 In addition to developing the proposed response and clean-up plans, the Proponent has committed to developing a long-term monitoring plan to establish a benchmark and to monitor the effects of a spill (should one occur) over an extended period of time. DFO is supportive of this commitment.

123 DFO has considered the Proponent's ecological risk assessment of the potential impacts of an oil spill caused by a tanker accident and marine terminal malfunction on fish, fish habitat and fisheries resources. DFO notes that the Proponent considers predicting and quantifying impacts of an oil spill on fisheries resources somewhat challenging given the uncertainty surrounding the multiple factors that would influence a prediction.

124 The Proponent has conducted its ecological risk assessment under multiple hypothetical scenarios involving locations and spill volumes to identify risks to fish, fish habitat and fisheries resources. In DFO's view, the Proponent has conducted a reasonable risk assessment and provided useful information on the risks that an oil spill would pose to fisheries resources in freshwater and marine environments.

125 The Proponent has proposed mitigation, including vessel construction and safety standards, navigational aids and tug boat assistance. In addition, the Proponent is developing emergency and contingency response plans and intends to work with key stakeholders on these plans.

126 The analysis of the accuracy of the spill likelihoods, spill trajectories, or fate and behaviour of chemicals of potential concern present in oil lies outside of DFO's expertise and mandate.

3.3.8.1 Impacts on Aboriginal, Recreational and Commercial Fisheries

127 DFO manages marine fisheries within the PEAA. Project activities that may affect fisheries management decisions or agreements in place increase the relative level of risk the Project may pose to fisheries, in addition to the risk to fish and fish habitat. For instance, intertidal clam resources support important FSC fisheries, as well as recreational and commercial fisheries in the shipping corridor and approaches. First Nations communities in the corridor rely on intertidal clams for FSC harvests; many have Community Harvest Plans. Significant commercial fisheries, either entirely or mostly comprised of First Nations participants, are carried out near Bella Bella (Manila and littleneck clams) and on the beaches of northern Graham Island, Haida Gwaii (razor clams) (DFO 2010, Jones *et al*. 2001).

128 Currently within the Pacific region, there are FSC agreements with 78 First Nations that include salmon, 20 of these First Nations are located on the North Coast. First Nations also fish commercially: two licence categories (N and F) identify communal aboriginal

participation within the commercial salmon fishery. Both licence categories are held communally and allow Aboriginal communities to designate vessels and individual fishers to carry out the fishing. The Northern Native Fishing Corporation holds 254 gillnet licences (Category N), of which 193 were in the North Coast in 2010. Of the 119 F (Communal Commercial) licences in 2010, 49 are for the North Coast.

129 Dungeness crabs support important FSC, recreational and commercial fisheries within and adjacent to the shipping corridor and approaches. The EIS suggests that the commercial crab fishery in Crab Management Area B is small compared to coast-wide production. However, the northern approach route passes through and adjacent to the important and productive commercial crabbing grounds in Crab Management Area A (Harbo and Wylie 2006). In addition to important FSC fisheries, Dungeness crabs are an important recreational resource. The spatial patterns of effort in groundfish trawl and hook and line fisheries also overlap considerably with all three shipping approaches.

130 The EIS includes comprehensive summaries of fisheries in the area (see Volume 8C section 9.4.1.4 and Table 9.3 for an area based activity summary). The EIS notes that potential impacts could be the loss of fishing grounds, disruptions to access for weeks to years, and potentially longer travel times for some fishers to seek alternative grounds. The mitigation the Proponent has committed to implementing includes the improved tanker safety (e.g., tankers with double hulls), improved navigational aids (e.g., radar, buoys), and the establishment of a fisheries liaison committee.

3.3.9 Recommendations – Marine Impacts and Mitigation

1. DFO recommends that the Proponent provide a mitigation table that identifies mitigation measures for potential impacts to fish and fish habitat associated with all marine activities related to construction and operations. This table will more clearly link mitigation measures with potential impacts and increase the understanding of the appropriateness of proposed mitigation.

2. DFO recommends the Proponent to further develop the blasting management plans and sediment monitoring plan in consultation with DFO and other appropriate parties and submit updated versions to the Panel.

3. DFO recommends that the Proponent continue with its efforts to characterize distribution, abundance and density (including rarity and uniqueness) of cold-water sponges and corals near the proposed Kitimat Terminal to help provide an accurate characterization of potential impacts of terminal construction.

4. DFO recommends that the Proponent continue to design and implement a study that better describes the spatial and seasonal occurrence and densities of marine mammals in the CCAA and PDA. DFO also recommends that the risk

assessment of ship strikes in the OWA be expanded to quantify the likelihood of injury or mortality to grey whales during their spring migration through Hecate Strait and Dixon Entrance. In addition, the Department recommends that the Proponent review recent literature which indicates that ship strikes causing serious injury to or death of large whales do regularly occur at vessel speeds of 10 knot or less and consider additional mitigation measures as necessary. DFO is able to provide the Proponent with references.

5. DFO recommends that the Proponent plan its Project taking into consideration that eulachon, quillback rockfish and yellowmouth rockfish (all designated by COSEWIC as threatened or endangered) which will likely be listed under SARA. It is further recommended that when planning its Project the Proponent consider species that are being considered for listing as special concern under SARA (e.g., darkblotched rockfish and spiny dogfish).

6. DFO recommends that the Proponent follow the “Impact assessment protocol for works and developments potentially affecting abalone and their habitat” (see Lessard and Campbell 2007) and identify effective mitigation measures to avoid harm to the northern abalone during construction and operation or provide an alternative assessment.

3.3.10 Cumulative Effects

131 Under CEAA, cumulative effects are considered as those effects that are likely to result from a project in combination with other projects or activities that have been or will be carried out.

132 In the EIS (Volume 6A), cumulative effects are addressed on an impact by impact basis. The EIS provides a Regional Effects Assessment Area approach to cumulative effects assessment. The EIS outlines three conditions which must be met for cumulative effects assessments of each Project impact under consideration, which are: (i) the Project will result in a measurable, demonstrable or reasonably-expected residual effect (i.e., is there an effect that can be measured or that can be reasonably expected to occur?), (ii) the project-specific residual effect on a component of the environment does or is likely to act in a cumulative fashion with effects of other past or future projects (i.e., is there overlap of environmental effects?), (iii) and there is reasonable expectation that the Project’s contribution to cumulative effects will affect the viability or sustainability of the resource or value.

133 The cumulative effects assessment approach described in the EIS considers three scenarios: a base case scenario that considers conditions of measurable parameters existing prior to the implementation of the Project, a project case scenario that considers conditions of measurable parameters impacted by the Project, and future

case scenario which considers conditions of measurable parameters impacted by the Project in combination with other past and future projects. Additionally, the EIS presents a project inclusion list which sets out past, present and reasonably foreseeable projects in Alberta and British Columbia, which could overlap spatially and temporally with the residual effects of the Project. DFO considers the Proponent's approach to cumulative effects assessment to be appropriate with respect to potential impacts to fish and fish habitat.

134 With respect to watercourse crossings, the Proponent has taken the approach that since all HADDs would be either mitigated or compensated for, and would be authorized by DFO, NNL would be achieved and, as a consequence, pipeline watercourse crossings would not contribute to cumulative effects.

135 If NNL is achieved through mitigation measures and fish habitat compensation, DFO is of the opinion that the Proponent's approach to the cumulative effects assessment for watercourse crossings is reasonable. As the Proponent's approach to managing cumulative effects is based partially on achieving NNL through fish habitat compensation, DFO will need to review the fish habitat compensation plan that the Proponent has committed to developing in 2012 before finalizing the Department's assessment and comments on cumulative effects on fish and fish habitat.

136 In offering this opinion, DFO has followed the guidance provided in the Canadian Environmental Assessment Agency's "Cumulative Effects Assessment Practitioners Guide" that emphases biophysical effects (such as effects on fish and fish habitat) rather than socio-economic effects (CEAA 1999: vi).

3.3.11 Aboriginal Consultation

137 DFO has participated over the past few years in numerous meetings with Aboriginal groups across the proposed pipeline route and in coastal areas. The meetings were organized and chaired by the Canadian Environmental Assessment Agency in its capacity as the federal Crown Consultation Coordinator. Concerns raised by Aboriginal groups during these meetings related to fish and fish habitat have been noted by DFO, and the Department will consider further submissions to the Panel as the review process proceeds. DFO will continue to consult with Aboriginal groups throughout the regulatory phase following the Panel process and outcome.

138 The Government of Canada's submission to the Panel includes a chapter focused on the Crown's Aboriginal consultation process.

4 SUMMARY AND CONCLUSIONS

Freshwater Fish and Fish Habitat Risk Assessment

139 DFO has applied the Department's Habitat Risk Management Framework to the review of the proposed Project. This review considers a range of Project activities, including cumulative effects as well as accidents and malfunctions, the key POEs, the proposed mitigation, habitat compensation, the fish and fish habitat sensitivities, the scale of negative effects, and the risk rankings.

140 The Proponent has also taken a risk management approach, similar to DFO's Habitat Risk Management Framework. DFO recognizes that while final number of moderate and high-risk crossings that would cause a HADD may change, the worst-case scenario approach taken by the Proponent is an appropriate step for managing uncertainty.

141 DFO is generally satisfied with Proponent's risk management approach to selecting constructions techniques. The Proponent has established a path forward for developing a complete set of mitigation measures, and developed a risk categorization method that is flexible enough to account for foreseeable Project changes. The Proponent has committed to avoid HADDs where possible in the freshwater and, where HADDs are unavoidable, offset habitat loss through habitat compensation to meet the objective of NNL. The Proponent is currently developing a conceptual fish habitat compensation plan for the freshwater and marine environment and will seek input of DFO and participating Aboriginal groups to further improve the plan early in 2012. DFO notes that a technically and economically feasible habitat compensation plan would assist DFO in providing additional advice to the Panel about the potential impacts of the Project on fish and fish habitat.

142 DFO is of the view that the risk to fish and fish habitat in the freshwater environment can be managed by implementing appropriate mitigation and compensation measures, provided the Proponent meets their commitments to mitigate and offset impacts.

Marine Fish and Fish Habitat Risk Assessment

143 As in the case of freshwater fish and fish habitat risk assessment, the Proponent has taken a risk management approach to assessment of risk to marine fish and fish habitat.

144 While the precise extent of the marine HADD will not be determined until detailed engineering design is complete, the Proponent has committed to minimizing loss of marine habitat through project design and, where marine habitat loss due to terminal construction cannot be avoided, the Proponent has committed to providing fish habitat compensation. As noted above, the Proponent has committed to providing a compensation plan in early 2012.

145 DFO is of the opinion that the risk to fish and fish habitat in the marine environment can be managed by implementing appropriate mitigation and compensation measures, provided the Proponent meets its commitments to mitigate and offset any residual impacts.

Accidents and Malfunctions - Impacts on Fisheries Resources

146 DFO has considered the Proponent's ecological risk assessment of the potential impacts of an accident or malfunction-related oil spill on fish, fish habitat and fisheries resources in the freshwater and marine environments. DFO notes that the Proponent considers predicting and quantifying impacts of an oil spill on fisheries resources somewhat challenging given the uncertainty surrounding the multiple factors that would influence a prediction.

147 Despite the uncertainty, the Proponent has conducted a reasonable ecological risk assessment to identify risks to fish, fish habitat and fisheries resources. The Proponent has used an ecological risk assessment model to estimate risk to fish and fish habitat under multiple hypothetical scenarios involving locations and spill volumes. In DFO's view, the Proponent has conducted a reasonable risk assessment and provided useful information on the risks that an oil spill would pose to fisheries resources in freshwater and marine environments.

148 In assessing the risk to fisheries, the Proponent has provided a general description of the baseline setting relating to fisheries resources and assessment of potential effects of oil and bitumen. In addition, the Proponent has committed to developing a long-term monitoring plan to establish a benchmark and to monitor the effects of a spill (should one occur) over an extended period of time and DFO is supportive of this commitment.

149 The Proponent has proposed mitigation, including vessel construction and safety standards, navigational aids and tug boat assistance. In addition, the Proponent is developing emergency and contingency response plans and intends to work with key stakeholders on these plans.

Potential Cumulative Impacts

150 The Proponent has taken the approach that since all HADDs would be either mitigated or compensated for and would be authorized by DFO, NNL would be achieved and, consequently, the pipeline watercourse crossings and the marine HADD would not contribute to the cumulative effects.

151 If NNL is achieved through mitigation measures and a habitat compensation plan, DFO is of the view that the Proponent's approach to cumulative effects assessment of fish and fish habitat is acceptable.

152 As the Proponent's approach to managing cumulative effects is based on achieving NNL through fish habitat compensation, DFO will need to review the fish habitat compensation plan before the Department will be able to provide the Panel with additional advice about cumulative impacts.

Potential Impacts on Species at Risk

153 A number of marine and freshwater aquatic species listed under SARA exist in the Project area and may be exposed to an elevated level of risk of being adversely impacted by the Project. In addition, "critical habitat" has been identified in the vicinity of the Project. The Proponent has made a commitment to implementing appropriate mitigation measures to reduce potential impacts.

154 DFO accepts the Proponent's assessment and commitments, but notes that the Proponent is proposing trenchless crossing as primary construction method on Endako River, where white sturgeon is present. If this is the method employed, the impact is expected to be negligible. However there is some risk that a trenchless crossing may not be feasible because of the site conditions. The contingency crossing method is isolated open-cut which carries with it elevated risk of adversely impacting white sturgeon and their habitat. It will be important for the Proponent to ensure mitigation measures are sufficient and are implemented to avoid the risk of impacts to sturgeon.

Summary

155 In summary, DFO is of the view that the risk posed by the Project to fish and fish habitat in the freshwater and marine environments can be managed by the Proponent through appropriate mitigation and compensation measures. The Department has prepared this submission, which includes a number of recommendations, to assist the Panel in its consideration of the Project.

APPENDIX A: ACTS AND REGULATIONS

Fisheries Act
Available at: http://laws-lois.justice.gc.ca/eng/acts/F-14/

Oceans Act
Available at: http://laws-lois.justice.gc.ca/eng/acts/O-2.4/

Species at Risk Act
Available at: http://laws.justice.gc.ca/eng/acts/S-15.3/

Canadian Environmental Assessment Act
Available at: http://laws-lois.justice.gc.ca/eng/acts/C-15.2/

National Energy Board Act
Available at: http://laws.justice.gc.ca/eng/acts/N-7/FullText.html

Constitution Act
Available at: http://laws-lois.justice.gc.ca/eng/const/

Law List Regulations [under the *Canadian Environmental Assessment Act*]
Available at: http://laws.justice.gc.ca/eng/regulations/SOR-94-636/index.html

Marine Mammal Regulations [under the *Fisheries Act*]
Available at: http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-56/index.html

APPENDIX B: POLICIES, STRATEGIES AND PLANS

Canada's Oceans Strategy (2002)
Available at: http://www.dfo-mpo.gc.ca/oceans/publications/cos-soc/index-eng.asp

Canada's Oceans Action Plan (2005)
Available at: http://www.dfo-mpo.gc.ca/oceans/publications/oap-pao/page01-eng.asp

The Department of Fisheries and Oceans Policy for the Management of Fish Habitat, 1986 (DFO's Habitat Policy)
Available at: http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/fhm-policy/index-eng.asp

Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff, Version 1.0 (Habitat Risk Management Framework)
Available at: http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/risk-risque/page03-eng.asp

Practitioners Guide to Habitat Compensation, Version 1.0
Available at: http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/compensation/index-eng.asp

DFO's Operational Statements for British Columbia
Available at: http://www.pac.dfo-mpo.gc.ca/habitat/os-eo/index-eng.htm

DFO's Operational Statements for Alberta
Available at:
http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territories-territoires/ab/index-eng.htm

Pacific North Coast Integrated Management Area (PNCIMA) Initiative
Available at: http://www.pac.dfo-mpo.gc.ca/oceans/man-gest/im-gi-eng.htm and http://www.pncima.org

APPENDIX C: REFERENCES

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APPENDIX D: ACRONYMS AND ABBREVIATIONS

CCAA	Confined Channel Assessment Area
CEAA	*Canadian Environmental Assessment*
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EIS	Environmental Impact Statement (NEB Act section 52 Application)
FSC	Food, Social and Ceremonial
HADD	Harmful Alteration, Disruption or Destruction
IR	Information Request
LRP	Least Risk Period
LOMA	Large Ocean Management Areas
NEB	National Energy Board
NNL	No Net Loss
OWA	Open Waters Area
Panel	Enbridge Northern Gateway Project Joint Review Panel
PDA	Project Development Area
PEAA	Project Effects Assessment Area
PNCIMA	Pacific North Coast Integrated Management Area
POEs	Pathways of Effects
Project	Enbridge Northern Gateway Project
Proponent	Northern Gateway Pipelines Inc.
RMF	Habitat Risk Management Framework
ROW	Right of Way
SARA	*Species at Risk Act*
TDR	Technical Data Report

Part II

Submission of the

Canadian Coast Guard

1 GENERAL DISCUSSION

1.1 Introduction

1 The Canadian Coast Guard is a Special Operating Agency of Fisheries and Oceans Canada. In Canadian waters and the Exclusive Economic Zone, the Canadian Coast Guard is the operational arm of the Government of Canada responsible for: ensuring an appropriate response to ship-source and mystery-source pollution incidents; providing aids to navigation and waterways management services; and providing marine communication and traffic services.

2 This submission is intended to convey to the Panel, the Proponent and other interested parties, the analysis of the Canadian Coast Guard relative to its mandate dealing with Pollution Prevention and Response and Marine Transportation, including Aids to Navigation, Waterways Management, and Marine Communication and Traffic Services.

Pollution Response

3 The Environmental Response Program of the Canadian Coast Guard constitutes a major component of the overall marine pollution response capacity in Canada.

4 In addition, an industry funded pollution response capacity exists whereby potential polluters pay for the cost of preparedness for the environmental risk posed by their operations. This preparedness is established and maintained by Transport Canada's certified Response Organizations that can be contracted by polluters to provide oil spill response services in the event of a marine pollution incident. This industry funded capacity is known as the *Canadian Marine Oil Spill Preparedness and Response Regime* (the "Regime") and forms the other component of Canada's overall marine pollution response capacity.

5 The Government of Canada is accountable to Canadians to ensure that the public interest is being protected in the event of a marine pollution incident. The Canadian Coast Guard monitors the polluter's response, which may utilize the polluter's resources, a Response Organization, and/or some other service provider to conduct a response. In the event that the polluter is unknown, unable or unwilling to respond, the Canadian Coast Guard will manage the response. In any case, the Canadian Coast Guard will ensure an appropriate response. Furthermore, the Canadian Coast Guard can provide assistance and resources to another lead agency for the conduct of a response.

6 The Canadian Coast Guard's Environmental Response evidence is based on a review and analysis of all information available as of November 24, 2011, including:

- General Oil Spill Response Plan,
- Responses to Information Requests.

Any future information or analysis filed by the Proponent will need to be reviewed and may require modifications to material submitted at this time.

Aids to Navigation

7 The Canadian Coast Guard's Aids to Navigation Program provides an extensive system of short-range and long-range aids (1800) to navigation throughout coastal communities and inland waterways in the Pacific Region. The West Coast is dotted with thousands of rocky outcroppings, ledges, and shoals. Depending on where these navigational hazards lie they may have the potential to cause considerable damage to vessels and the surrounding environment. Aids to navigation are placed to mark preferred channels and to ensure that mariners are warned of potential dangers before they cause significant damage.

8 The Program provides aids to navigation where the volume of traffic justifies and the degree of risk requires, in accordance with its design methodology and provision directives. By ensuring access to a reliable aids to navigation system, it supports a safe, accessible, and efficient environment for the commercial marine transportation sector, fishers and pleasure craft operators. Aids to navigation are provided to assist mariners in safe navigation and do not replace prudent navigation practices or the use of onboard navigational equipment such as the latest charts, GPS technology and radar.

9 Aids to navigation in the Pacific Region are maintained at Canadian Coast Guard bases at Victoria and Prince Rupert. Technicians from both bases work to maintain buoys, beacons, lightstations, and Differential Global Positioning stations. The Canadian Coast Guard's wide range of vessels and helicopters stationed in Victoria and Prince Rupert carry out this task year round.

10 Canadian Coast Guard's Aids to Navigation program is also responsible for providing detailed information on the operation of, and changes to specific aids. This information is communicated to mariners through Notice to Shipping MCTS broadcasts and Notice to Mariner publications and Internet postings. Canadian Hydrographic Services also receives this information for inclusion onto nautical charts.

Waterways Management

11 Navigability in Canadian waterways is highly influenced by water levels and the bottom condition of shipping channels. The monitoring and maintenance services provided by

the Waterways Management program enable Coast Guard to support safe, economical, and efficient movement of ships in Canadian waterways. These services also contribute to the maintenance of specific navigable channels, reduce marine navigation risks, and support environmental protection.

12 The Waterways Management Program is influenced by the trend to bigger and faster vessels, and increasing pressure to maximize water levels and channel depths for optimum loading, climate change, safety maneuvering limits, and the need to balance between environmental and economical interests. These issues increase the need to maintain our engineering guidelines for the design, maintenance and utilization of commercial channels. Users continue to ask for current waterways conditions such as water-depth forecasts and channel-bottom information, to the extent possible.

Marine Communication and Traffic Services

13 Marine Communications and Traffic Services provides: marine safety communications co-ordination with rescue resources; and the Joint Rescue Co-ordination Centre Victoria; vessel traffic services and waterway management; broadcast weather and safety information; sail plan services to support other government and marine agencies. In the Pacific Region, there are five centres located at Vancouver, Victoria, Prince Rupert, Comox and Tofino.

14 In Vancouver, the Region Marine Information Centre disseminates marine safety and navigation information and administers the Notices to Shipping function in the Pacific Region. The Centre provides offshore screening to ensure that vessels with defects or deficiencies are identified and compensatory measures are developed. The Region Marine Information Centre is responsible for callout for agencies involved in front line response to land and marine environmental and pollution emergencies.

15 One of the most important functions of Marine Communications and Traffic Services is to provide Vessel Traffic Services to vessels operating in Canadian waters. In order to make voyages safer and to protect the environment, Vessel Traffic Services provide a means of exchanging information between ships and a shore-based Centre. This information is communicated to all vessels greater than twenty metres and others that comply with the Vessel Traffic Services Zones regulations. Canada's Vessel Traffic Services system are operated by highly trained, certified Marine Communication and Traffic Officers, who monitor the movement of vessels using VHF radio and direction finding equipment, tracking computers, and, in areas of high traffic density, surveillance radar.

16 Vessel Traffic Services (VTS) are provided in VTS Zones as established under regulations. Vessels approaching the West Coast bound for ports of Prince Rupert and

Kitimat will enter an area of responsibility of the Prince Rupert Traffic Zone. The Prince Rupert Marine Communications and Traffic Services Centre operates twelve remote VHF radio sites. The Prince Rupert Zone is the largest Vessel Traffic Services Zone in Canada, extending from Cape Caution to the Alaskan border and encompasses more than 77,000 square kilometres (30,000 square miles). All ships twenty metres or more in length must obtain a Vessel Traffic Services clearance.

17 Maritime Communications and Traffic Services contributes to the safety of life at sea, the protection of the marine environment, the efficient movement of shipping in waterways, and the provision of essential and accurate information to mariners. Its services are essential to deploying Search and Rescue and Environmental Response teams promptly and effectively to maritime crisis situations.

1.2 Mandate, Responsibilities and Guiding Legislation

18 The *Constitution Act, 1867* provides Parliament with an exclusive legislative jurisdiction over navigation and shipping matters. Pursuant to the *Emergency Management Act*, federal Ministers have a statutory responsibility to ensure each department, agency or Crown Corporation within their area of responsibility has an emergency plan to deal with civil emergencies related to their area of accountability. Federal government policy for emergency preparedness is to assign lead agency responsibility to the predominant department. Under the Federal Emergency Response Plan (January 2011), there are thirteen emergency support functions listed with the primary departments that are responsible. Canadian Coast Guard is listed as a support department for nine of those thirteen emergency support functions.

19 Through legislation such as the *Oceans Act*, the *Canada Shipping Act, 2001*, and the *Arctic Waters Pollution Prevention Act*, the Canadian Coast Guard has lead agency responsibility for ensuring a response to ship-source spills, mystery source spills, pollution incidents that occur at Oil Handling Facilities as a result of loading or unloading oil to or from ships, and spills from any source originating in foreign waters that impact Canadian waters and Exclusive Economic Zone.

1.2.1 Oceans Act

20 Section 41 of the *Oceans Act*, provides for the powers, duties and functions of the Minister of Fisheries and Oceans as Minister responsible for coast guard services including: aids to navigation, marine communications and traffic management services, channel maintenance, and marine pollution response.

1.2.2 Canada Shipping Act, 2001

21 The *Canada Shipping Act, 2001* and the development of its regulations are under the responsibility of Transport Canada. The regulations governing the Regime only address oil pollution from certain sized ships and oil handling facilities. The Regime was established in 1995 and aligns ships of a certain tonnage and oil handling facilities with a Transport Canada certified Response Organization that will respond to an oil spill on the polluter's behalf.

22 Part 8 of the *Canada Shipping Act, 2001* provides the Minister of Fisheries and Oceans with powers and authorities relative to Pollution Prevention and Response. The Canadian Coast Guard maintains the lead operational role and overall responsibility for effective and efficient responses to ship-source pollution.

23 Subsection 180(1) gives the Minister of Fisheries and Oceans, and therefore the Canadian Coast Guard, the authority to take measures to repair, remedy, minimize or prevent pollution damage from a vessel or an oil handling facility if it is believed on reasonable grounds that the vessel or an oil handling facility has discharged, is discharging or is likely to discharge a pollutant. These powers can be exercised in Canadian waters and Exclusive Economic Zone. The Coast Guard also has authority to monitor the clean up efforts conducted by others so they are done to the satisfaction of the federal government and, if considered necessary, to direct a person or vessel to take appropriate measures.

24 The mandate of the Canadian Coast Guard to take measures with respect to a discharge at an oil handling facility is limited in that the oil handling facility must be engaged in loading to or unloading from a vessel, that directly or indirectly results in the pollutant entering the water, and includes spill, leaking, pumping, pouring, emitting, emptying, throwing and dumping.

25 Part 5 of the *Canada Shipping Act, 2001* provides the Minister of Fisheries and Oceans with powers and authorities relative to Navigation Services including aids to navigation and vessel traffic services.

2 PROJECT REVIEW AND ANALYSIS

2.1 Pollution Response

26 In reviewing the Project Proposal, the Canadian Coast Guard offers observations across three main areas – response capability, research and development, and the General Oil Spill Response Plan. These observations are explained below.

2.1.1 Response Capability

27 Resulting from the recommendations of the Public Review on Tanker Safety and Marine Spills Response Capability in 1990 (Brander-Smith Report), Canada developed a system that divides prevention preparation and response between the public and private sectors, namely government and ship owners. The prevention aspects are regulated by Transport Canada, which monitors vessel compliance to those conventions that dictate vessel operations. Preparation is also divided in that the Canadian Government owns and operates its own spill response assets which are strategically placed pursuant to the various related plans. The Canadian Government also established a funded private sector oil spill response preparedness regime which is regulated by Transport Canada. However, it must be noted that this regime only addresses oil pollution from ships (tankers larger then 150 Gross Registered Tons and all vessels larger then 400 Gross Registered Tons). It is the expectation of the Canadian Government that the Polluter will effectively respond to his own spill and that such response will be monitored. This monitoring function is led by the Canadian Coast Guard.

28 The *Canada Shipping Act, 2001* stipulates that vessel of a prescribed class shall have an arrangement with a response organization in respect of a quantity of oil that is at least equal to the total amount of oil that the vessel carries, both as cargo and as fuel, to a prescribed maximum quantity, and in respect of waters where the vessel navigates or engages in a marine activity. The *Act* also stipulates that operators of oil handling facilities of a prescribed class shall have an arrangement with a certified response organization in respect of any quantity of oil that is, at any time, involved in being loaded or unloaded to or from a vessel at the oil handling facility, to a prescribed maximum quantity and have on-site an emergency pollution response plan that meets the prescribed requirements to respond to a discharge of oil during the loading or unloading of a vessel.

29 Transport Canada certifies Response Organizations to maintain a capability to respond to a spill of a maximum of 10,000 metric tonnes. This capacity is calculated based upon Designated Ports and Enhanced Response Areas. An important piece of Canada's Marine Oil Spill Response Regime are Designated Ports; each with a Primary Area of Responsibility. A designated port has higher volumes of oil transferred between the shore and a vessel than other ports. The associated higher risk requires more concentrated response capability. A designated port thus has advantages with respect to spill response time and capability.

30 If the planned annual volumes of oil to be loaded or unloaded at a port reach or exceed 500,000 tonnes annually for three consecutive years, Transport Canada may consider the port for designated port status. Preliminary figures from the Proponent indicate that the Project will meet or exceed these criteria.

31 An Enhanced Response Area is an area similar to a Designated Port but without the requirement for response organization installations.

32 Canada's west coast presently has one Designated Port (Vancouver) and one Enhanced Response Area (Strait of Juan de Fuca). The current certified Response Organization for these areas provides coverage within the time standards set out in Transport Canada's *Response Organizations Standards*.

33 The replacement of the old *Canada Shipping Act* with the CSA 2001 in July 2007 eliminated the regime's original procedure for designating ports. However, under the CSA 2001, the Governor in Council may enact new regulations that would allow a port to be designated.

34 Currently, the Canadian Coast Guard has limited response equipment and no personnel located in Kitimat. In the event of a major spill, resources would have to be deployed from Prince Rupert, Richmond or Victoria, B.C.

35 A project of this magnitude should base the calculation of response times from Kitimat, as if it were a Designated Port. This would provide a significant enhancement of spill response resources in the area. For example, the requirement of additional resources such as port-dedicated equipment and personnel would increase capability in the area and provide faster response times.

2.1.2 Observation – Response Capability

36 To ensure an appropriate response to a pollution incident in the Kitimat area, response capability for the Proponent and Canadian Coast Guard should be calculated based upon the regulations established for Designated Ports and/or Enhanced Response Areas. This will require additional pollution response capacity in the form of equipment and personnel for both entities.

2.1.3 Research and Development

37 The products proposed to be transported through the Northern Gateway pipeline reflect a range of petroleum products that are generally not recovered through drilling. For the purpose of spill response planning and technology, the Proponent's *General Oil Spill Response Plan* does not distinguish between the products. Although the Canadian Coast Guard does have some expertise in operational response issues, when considering petroleum products and more specifically a range of petroleum products, the Canadian Coast Guard depends on other federal departments or agencies. This includes Environment Canada, the lead federal department responsible for providing scientific product advice regarding environmental impacts of the products, and for

providing product analysis and expertise on response technologies (for example mechanical recovery, in-situ burning, and the use of dispersants).

38 The Canadian Coast Guard is not aware of a scientific consensus regarding how these products will behave once introduced into the marine environment (e.g., if they will dissolve, spread, emulsify, etc.) or the impact over time of the products being in the water (known as "fate and effects"). The Canadian Coast Guard therefore is uncertain whether or not traditional oil spill recovery methods would be effective when dealing with these products. Information provided to date from the Proponent, Environment Canada, and Response Organizations, would seem to indicate that further work needs to be done to better understand the fate, effects and available response technology for these products.

2.1.4 Observation - Research and Development

39 Increased technical and operational knowledge in what may be considered a highly specialized area of environmental response would be of significant benefit given the projected growth in ship traffic (including larger ships) and related environmental risks.

40 Further, research and development would enhance knowledge of fate, behaviour and impact of spills, response techniques and technology application with respect to these petroleum products and the outcomes could be reflected in the *General Oil Spill Response Plan* (the "Plan"). This knowledge is of interest to a variety of stakeholders, including Canadian Coast Guard, Transport Canada, Environment Canada and other Response Organizations.

2.1.5 General Oil Spill Response Plan

41 The Proponent submitted a *General Oil Spill Response Plan* which addresses the overall requirements for spill response, including the oil handling facility.

42 It is recognized that the Plan at this point was provided as a general overview prior to the submission of all the necessary detailed plans pursuant to Part 8 of the *Canada Shipping Act, 2001*. Once all detailed plans are prepared and submitted for Transport Canada review, as part of the process the Plan must be tested and exercised before any operations can commence.

43 The Plan indicates the Proponent's intent to go beyond the scope of current regulations (i.e., having more than 32,000 metric tonnes of response capability), while the *Response Organizations and Oil Handling Facilities Regulations* only require a 10,000 metric tonnes capacity and the provision of dedicated escort tugs.

2.1.6 Observations - General Oil Spill Response Plan

44 Although the Plan cannot be properly evaluated until the R&D work on the range of petroleum products has been completed, the Canadian Coast Guard observes that the Plan may not adequately cover all of the elements of spill management and response. Some additional areas for consideration and/or inclusion in the Plan include:

- Identifying the challenges of poor working conditions in the Open Water Area and Confined Channel Assessment Area, particularly when tracking and recovering a range of oils.
- Developing a workforce framework to guide the hiring, registering, screening, training, supervising, accommodating and paying a workforce responding to a spill in a remote area such as Kitimat.
- Addressing oily waste transportation and disposal.
- Responding to a condensate spill, including response objectives and strategies, and hazard exposures.
- Validating Non-Governmental Organizations capability to support various functions in the event of a major oil spill, and capability to commence on-water response immediately upon arrival of equipment such as booming/skimming material.
- Identifying responsible party or parties under various spill scenarios (i.e., pipeline, terminal, tug/escort, and tanker).

45 Development of the necessary details in the Plan with respect to prevention, preparedness and response will provide assurance that all plans are compatible with and meet Transport Canada regulatory requirements. Furthermore, collaboration with all interested stakeholders, such as the Canadian Coast Guard, Transport Canada, Environment Canada, and British Columbia Ministry of Environment in this process would be beneficial.

46 To ensure that the detailed plans have been subjected to a rigorous series of tests and exercises, Canadian Coast Guard can assist in the development and evaluation of the exercises. This level of involvement is commensurate with exercises conducted with other industry partners, and will be incorporated into the annual exercise planning for the Program. This collaboration would allow for the incorporation of lessons learned through the process of our respective response plans and provides an additional opportunity for Canadian Coast Guard to exercise with partners with whom they would work in the event of a pollution incident.

2.2 Marine Transportation

47 In reviewing the Project Proposal, the Canadian Coast Guard offers observations across three main areas – aids to navigation, waterways management and marine communications and traffic services. These observations are explained below.

2.2.1 Aids to Navigation

48 With the exception of the Oceans Data Acquisition System Buoy at Spencer Bank, the proposal complies with the "Canadian Aids to Navigation System" requirements for lateral aids to navigation.

2.2.2 Observations - Aids to Navigation

49 The Aids to Navigation Program must complete a thorough review of the aids to navigation system, in accordance with its design methodology and provision directives, to determine the aids to navigation requirements for safe and efficient navigation in the area. The Program is committed to doing this review.

50 In addition to identifying the requirements for the aids, the review will also identify the responsible authority to implement and maintain the aids. A key consideration is that the Canadian Coast Guard does not provide aids to navigation for a single or a small number of users. In addition, the Aids to Navigation Program is not funded to provide new aids to navigation. The installation of new aids to service Kitimat is estimated to cost in the order of magnitude of $2.5 million - $3 million, which does not consider or include maintenance costs.

2.2.3 Waterways Management

51 Waterways Management has reviewed the documentation from the applicants.

2.2.4 Observation - Waterways Management

52 The physical characteristics of the proposed waterways fall within the Channel Design Guidelines of the Waterways Management Program.

2.2.5 Marine Communication and Traffic Services

53 MCTS Pacific is currently conducting a calling-in-point (CIP) review which includes the entire BC coast. This did not specifically reference the Northern Gateway proposal, although discussions in TERMPOL 3.5 & 3.12 indicated that additional CIPs in the Outside Passage would enhance the effectiveness of the current VTS system and increase navigational safety in the area. Client responses to the MCTS-developed questionnaire will determine need.

54 MCTS may recommend additional MCTS safety broadcast functions for heavier traffic areas, or as per pilots' request. This would be consistent with the congested zones established by Port Metro Vancouver (Second Narrows MRA and First Narrows Zone), which in an MOU with MCTS delegates authorities that include, among other things, "clear narrows" and speed reduction broadcasts, and monitoring for crossing and following distances and arrangements. Alternatively or in addition, there are areas worthy of consideration that approximate the Turn Point Special Operating Area (SOA) that includes monitoring (voluntary) minimum following distances, etc. In the case of the proposed Northern Gateway routings, such areas could include—as per pilots' assessments in the given studies—Principe Channel, a length of 2 nautical miles, from abeam Wheeler Island to abeam Bush Island (southwest of Dixon Island); Otter Channel, a length of 4 nautical miles, from abeam Fanny Point through the Channel until abeam Fleishman Point; Lewis Passage, a length of 8 nautical miles, from abeam Turtle Point (Gill Island) to passage of Keld Point (Fin Island); Douglas Channel, a length of 6 nautical miles, from abeam Kersey Point (Maitland Island) to abeam Paisly Point; and Wright Sound, where there is a complexity of crossing and turning vessels, including tankers), and the Kitimat area (considering a multitude of additional proposed projects by other companies.

2.2.6 Observations - Marine Communication and Traffic Services

55 The proposal does not involve a significant workload increase for marine communications and vessel traffic services. The Project-related tankers will increase the existing Douglas Channel marine traffic by about 220 vessels per year or an increase of 86% compared to current traffic to Kitimat. At Wright Sound, the Project-related tankers will cause a 14% increase in reporting traffic. At the Prince Rupert MCTS station, Project-related tankers will cause an increase of 3% for the total reporting traffic. Non participating traffic levels, currently estimated by marine communications and vessel traffic services to be as much as participating traffic, may rise slightly with projected development in Kitimat. Workload would involve clearances, advisories, NOTSHIPs (as necessary), and broadcasts (as necessary).

56 There is no requirement for additional sensors. The proposed tanker traffic will include navigational officers, doubled hulled vessels, pilots, at least 2 tugs, and aids to navigation, including AIS that marine communications and vessel traffic services and others will monitor. VHF reception is sufficient for Douglas Channel.

57 The proposal contravenes no policy, legislation, or regulation as regards marine communications and vessel traffic services. It complies with marine communications and vessel traffic services-related clauses in the *Canada Shipping Act* (2001) and the Vessel Traffic Services Zones Regulations.

3 SUMMARY AND CONCLUSIONS

58 The Canadian Coast Guard has made several observations in the areas of Pollution response and Marine Transportation.

3.1 Pollution Response

59 In delivering the mandate of ensuring an appropriate response to all pollution incidents in waters under Canadian jurisdiction, the Canadian Coast Guard works closely with other government departments, such as Transport Canada and Environment Canada. Together, these partnerships form Canada's marine pollution preparedness and response system, a multi-agency approach that sees a network of federal, provincial, territorial, industry and international partners working collaboratively to prepare for and respond to marine pollution events. The Canadian Coast Guard has worked closely with Transport Canada and Environment Canada in considering the Proponent's proposal and providing observations to ensure an appropriate response capability that would address potential risks of pollution in the marine environment. As such, the review of the Northern Gateway Project proposal by the Canadian Coast Guard considered the information provided on the Proponent's proposed plans and measures for emergency preparedness and response with respect to the mitigation of risks of potential hydrocarbon releases.

Observation #1 - Response Capability

60 To ensure an appropriate response to a pollution incident in the Kitimat area, response capability should be calculated based upon the regulations established for Designated Ports.

Observation #2 - Range of Petroleum Products

61 A Research and Development Program focusing on enhancing knowledge of fate, effects, behaviour and impact of spills, response techniques and technology application with respect to this range of petroleum products would be of significant benefit given the projected growth in ship traffic (including larger ships) and related environmental risks beneficial.

Observation #3 - General Oil Spill Response Plan

62 Although the Plan cannot be properly evaluated until the R&D work on the range of petroleum products has been completed, the Canadian Coast Guard observes that the Plan may not adequately cover all of the elements of spill management and response.

63 To ensure that the detailed plans have been subjected to a rigorous series of tests and exercises, Canadian Coast Guard can assist in the development and the evaluation of

the exercises. This collaboration would allow for the incorporation of lessons learned through the process of our respective response plans.

3.2 Marine Transportation

64 It is difficult to assess the full impacts to Canadian Coast Guard activities resulting from this Project; however, the Canadian Coast Guard encourages the proponent to work in coordination with our Pacific regional office to identify levels of service.

Observation #4 – Aids to Navigation

65 In accordance with its design methodology and provision directives, the Aids to Navigation Program will determine the requirements for safe and efficient navigation in the area by completing a thorough review of the aids to navigation system.

Observation #5 – Waterways Management

66 The physical characteristics of the proposed waterways fall within the Channel Design Guidelines of the Waterways Management Program.

Observation #6 – Marine Communications and Vessel Traffic Services

67 The proposal does not involve a significant workload increase for marine communications and vessel traffic services. The proposal contravenes no policy, legislation, or regulation as regards MCTS. It complies with MCTS-related clauses in the *Canada Shipping Act* (2001) and the Vessel Traffic Services Zones Regulations.