

CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY

IN THE MATTER OF an application by the Vancouver Fraser Port Authority pursuant to the *Canadian Environmental Assessment Act, 2012*, SC, c 19, s 52 to build the Roberts Banks Terminal 2 Project.

VOLUME 1 OF 2

**WRITTEN SUBMISSIONS RECORD ON BEHALF OF
DAVID SUZUKI FOUNDATION, GEORGIA STRAIT ALLIANCE,
RAINCOAST CONSERVATION FOUNDATION & WILDERNESS COMMITTEE**

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IN THE MATTER OF an application by the Vancouver Fraser Port Authority pursuant to the *Canadian Environmental Assessment Act, 2012*, SC, c 19, s 52 to build the Roberts Banks Terminal 2 Project.

**WRITTEN SUBMISSIONS OF
DAVID SUZUKI FOUNDATION, GEORGIA STRAIT ALLIANCE,
RAINCOAST CONSERVATION FOUNDATION & WILDERNESS COMMITTEE**

April 15, 2019

Date submitted

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I. Overview

A. The proposed Roberts Bank Terminal 2 Project and the Panel's Review

1. The Vancouver Fraser Port Authority (the “Proponent” or “VFPA”), as described in the Environmental Impact Statement (“EIS”), is proposing to build a new container shipping terminal at Roberts Bank in Delta, British Columbia.¹² The proposed Roberts Bank Terminal 2 Project (the “Project”) would involve a three-berth container terminal providing an additional 2.4 million twenty-foot equivalents (“TEUs”) of container capacity per year. The Project would include construction and operation of the new terminal, widening of an existing causeway, expansion of an existing tug basin, and vessel traffic to and from the terminal.³ The Proponent estimated in the EIS that there would be 260 ship calls, equivalent to 520 ship movements, per year when the terminal is at full capacity by 2030.⁴ Once constructed the Project would operate indefinitely.⁵
2. The Project constitutes a designated project under the *Canadian Environmental Assessment Act* (“CEAA 2012”) and cannot lawfully proceed until subjected to an environmental assessment under CEAA 2012.⁶ In January 2014, due to the Project’s likely impacts on areas of federal environmental responsibility, the Minister of Environment and Climate Change directed that the environmental assessment of the Project would proceed by way of review panel, the terms of reference for which were finalized in April 2015 (the “Terms of Reference”).⁷ The EIS, concerning the construction and operation of the terminal, was

¹ Document #181, “Environmental Impact Statement” [EIS] (27 March 2015), Volume 1, Sections 1.0-7.0 [here](#), PDF p 1.

² A note on footnotes: Where footnotes indicate “PDF p”, the pinpoints refer to the page number of the indicated PDF. Where footnotes indicate only “p”, the pinpoint refers to the page number belonging to the referred-to document itself, usually found at the bottom right-hand corner of the document pages.

³ Document #181, EIS, Volume 1, Sections 1.0-7.0 [here](#), PDF pp 53-68, 94-97; Document #1532, “From the Review Panel to the Minister of Environment and Climate Change re: Response to letter regarding Proposed Amendments to the Terms of Reference and Environmental Impact Statement Guidelines”, [here](#) [Letter from Panel re: Proposed Amendments]; Document #1530, “Letter from the Minister of the Environment and Climate Change to the Review Panel re: Proposed Amendments to the Review Panel Terms of Reference and Environmental Impact Statement Guidelines (Note: Updated March 12, 2019)”, [here](#) [Letter to Panel re: Proposed Amendments].

⁴ Document #181, EIS, Volume 1, Sections 1.0-7.0 [here](#), PDF p 97.

⁵ Document #181, EIS, Volume 1, EIS Sections 1.0-7.0 [here](#), PDF p 70.

⁶ *Canadian Environmental Assessment Act, 2012*, SC 2012, c 19, s 52, ss 6, 13 [CEAA 2012].

⁷ Document #10, “Notice of Referral to a Review Panel” (7 January 2014, updated 31 August 2016), [here](#); Document #176, “Final Roberts Bank Terminal 2 Project Review Panel Terms of Reference (Version Amended April 22)”, [here](#).

completed in April 2015. In October 2015, an assessment of the impacts of operation of the vessels calling at the terminal out to the 12 mile territorial sea limit was completed (the “Marine Shipping Addendum”).⁸ In May 2016, a three person panel was appointed to conduct the environmental assessment (the “Review Panel”).⁹ In March 2017, a new member was appointed to the Review Panel.¹⁰ In March 2019 the Review Panel announced that the public hearing would on the Project would commence on May 14, 2019.¹¹

3. On March 8, 2019, the Minister of Environment and Climate Change wrote to the Review Panel to advise that she intended to amend the Terms of Reference for the Review Panel to include marine shipping associated with the Project (“Project Related Shipping”) as part of the designated project under CEAA 2012.¹² The letter enclosed proposed amendments to the Terms of Reference and the Updated Guidelines for the Preparation of an Environmental Impact Statement. The Review Panel acknowledged this on March 15, 2019.¹³
4. The purpose of this public hearing is to provide the Review Panel with the opportunity to gather and test relevant information to enable a thorough review of the potential environmental effects of the Project and Project Related Shipping.¹⁴ CEAA 2012 requires the Review Panel to take into account the environmental effects of the designated project, their significance, and any measures available to mitigate adverse environmental effects. The *Species at Risk Act* (“SARA”) requires the Panel to identify *all* adverse effects of the Project on SARA-listed species and to ensure measures to avoid or lessen *all* of those effects – which is different from the CEAA 2012 focus on significant adverse effects that are likely to occur.

B. Overview of the Conservation Coalition’s position

⁸ Document #316, “Marine Shipping Addendum to the Environmental Impact Statement” (26 October 2015), [here](#) [*Marine Shipping Addendum*].

⁹ Document #408, “News Release: Roberts Bank Terminal 2 Project – Establishment of Review Panel” (31 May 2016), [here](#).

¹⁰ Document #939, “News Release: Roberts Bank Terminal 2 Project – New Member Appointed to Review Panel” (16 March 2017), [here](#).

¹¹ Document #1477, “News Release – Review Panel for Roberts Bank Terminal 2 Project Announces Date for Public Hearing” (1 March 2019), [here](#).

¹² Document #1530, *Letter to Panel re: Proposed Amendments*, [here](#).

¹³ Document #1532, *Letter from Panel re: Proposed Amendments*, [here](#).

¹⁴ Document #1476, “Public Hearing Procedures” (1 March 2019), [here](#) [*Procedure Guide*].

5. David Suzuki Foundation, Georgia Strait Alliance, Raincoast Conservation Foundation and Wilderness Committee (the “Conservation Coalition”) have a number of concerns about the likely adverse environmental effects of the Project. Due to practical limitations of time and resources, these written submissions will focus primarily on three categories of adverse effects: (1) the impacts of Project Related Shipping on the marine environment, and in particular the impact on SARA-listed marine species such as the endangered Southern Resident Killer Whales (the “Southern Residents”); (2) the impacts of the expansion of the terminal on salmon and salmon habitat in the Fraser River estuary; and (3) the marine greenhouse gas emissions (“GHGs”) from vessels calling at the terminal. The focus on these issues should not be interpreted as an endorsement of the Proponent’s assessment of the Project’s other potentially adverse effects or as acquiescence to those effects.

1. Impacts of shipping on SARA-listed marine species

6. Several SARA-listed marine species are likely to be affected by the Project, and in particular by Project Related Shipping.¹⁵ These include the Southern Residents, North Pacific Humpback Whale (“Humpback Whale”), harbour porpoise and Stellar Sea Lion. Marine shipping can affect marine species in several ways, including acoustic and physical disturbance, vessel strikes, and pollution. Project Related Shipping may also impact habitat quality of other species – for example through a spill of fuel or dangerous cargo – with effects on abundance and distribution of aquatic species and invertebrates, consequently affecting fish prey resources for SARA-listed species.¹⁶
7. As set out in more detail below, SARA requires the Review Panel to ensure that if the Project goes ahead there are measures to lessen or avoid the adverse effects of Project Related Shipping on all SARA-listed species, regardless of the significance of the effects.¹⁷
8. The condition of the endangered Southern Residents has deteriorated to the point where the federal Ministers responsible for them under SARA have determined that they face

¹⁵ Document #51, “From the Canadian Environmental Assessment Agency to Department of Fisheries and Oceans re: Project notification letter pursuant to Subsection 79(1) of the Species at Risk Act” (6 December 2013), [here](#) [*SARA Project Notification*].

¹⁶ Document #51, *SARA Project Notification*, [here](#).

¹⁷ *Species at Risk Act*, SC 2002, c 29 [*SARA*], s 79.

“imminent threats” to their survival and recovery.¹⁸ It is clear that the population cannot withstand additional negative pressures if it is to recover from its current endangered status or persist. Potential impacts of Project Related Shipping on Southern Residents include vessel strikes and physical disturbance and displacement, underwater noise, pollution and impacts on the whales’ primary prey, Chinook salmon.

9. The Southern Residents are protected from direct harm under s. 32 of SARA, which prohibits killing, harming, harassing, capturing or taking any individual of a wildlife species listed as endangered or threatened, such as the Southern Residents. The EIS and Marine Shipping Addendum demonstrate that the Project would harm or harass, and potentially kill, Southern Residents.
10. Southern Resident critical habitat is protected from destruction under s. 58 of SARA through the operation of the *Critical Habitat of the Killer Whale (Orcinus orca) Northeast Pacific Southern Resident Population Order* (the “Southern Resident Critical Habitat Protection Order”).¹⁹ The EIS and Marine Shipping Addendum demonstrate that the Project’s cumulative effects would destroy critical habitat.

2. Impacts of the Project on salmon habitat in the Fraser River estuary

11. The Project would be constructed and operate in the Fraser River estuary. The Fraser River is a globally significant river for salmon, and the estuary is important habitat for many populations of Fraser River salmon. The Project is likely to affect fish and fish habitat in the estuary. This includes impacts to fish habitat of very vulnerable populations of wild salmon, including several species which, as described below, have recently been assessed by the Committee on the Status of Wildlife in Canada (“COSEWIC”) as threatened or endangered. Final decisions on the listing of these species by the federal Cabinet are pending.
12. Impacts of the Project include further alteration and fragmentation of salmon habitat in the estuary, and obstruction migration of salmon to and from their natal streams. It is also likely that the estuary will be further contaminated through the routine operation of the

¹⁸ Government of Canada, “Southern Resident Killer Whale: Imminent Threat Assessment” (May 2018) [*Imminent Threat Assessment*], see Conservation Coalition Record [CCR], Volume 2, Appendix R.

¹⁹ *Critical Habitat of the Killer Whale (Orcinus orca) Northeast Pacific Southern Resident Population Order*, SOR/2018-278 [*Critical Habitat Order*].

terminal and there is the increased risk of a significant fuel spill in the estuary that could contaminate both salmon and their habitat.

3. Marine greenhouse gas emissions from Project Related Shipping

13. Shipping is a significant and increasing source of GHGs globally. Since 2016, the Intergovernmental Panel on Climate Change has published a summary of exhaustive research and modelling which concludes that avoiding the catastrophic impacts of climate change will require significant and far reaching changes at all levels of society.²⁰ The Proponent has not proposed a plan to offset the GHGs from the Project. The Conservation Coalition is concerned that increased emissions are likely be an adverse effect of the Project.

4. Effects of the Project likely to be significant

14. It is clear based on the record thus far that the Review Panel must ultimately find that the Project is likely to have significant adverse environmental effects.
15. As described below, the Project would further jeopardize the survival and recovery of the endangered Southern Residents, pushing a species whose survival is at imminent risk further towards extinction. The Project also threatens to further degrade important habitat of many struggling conservation units of salmon. Salmon is the ecological lifeblood of the Pacific coast as well as being an iconic coastal species central to the cultures and economies of both First Nation and settler communities. The recent declines in wild salmon populations have widespread ecological, economic and cultural impacts. The Project would also result in marine GHGs of high magnitude. The consensus of the world's leading climate scientists is that we must drastically reduce our greenhouse gas emissions if we are to limit warming to 1.5°C and avoid significantly increased impacts of climate change associated with a 2°C increase in global average temperatures.²¹
16. It is also likely, based on the evidence discussed below, that it will not be possible to fully mitigate or avoid all of these impacts.

²⁰ IPCC, 2018: Summary for Policy Makers, In: Global Warming of 1.5°C An IPCC Special Report on the Impacts of Global Warming of 1.5° above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [*IPCC Report*]. See CCR, Volume 2, Appendix Q, PDF p 447.

²¹ *IPCC Report*, CCR, Volume 2, Appendix Q.

17. Thus, the Conservation Groups anticipate that at the close of the hearing they will submit that the Review Panel should recommend to the Minister that the Project will result in significant adverse environmental effects that cannot be justified in the circumstances.

C. The Conservation Coalition

18. The David Suzuki Foundation is a national, bilingual non-profit organization headquartered in Vancouver, with offices in Toronto and Montreal. Through evidence-based research, education and policy analysis, it works to conserve and protect the natural environment, and help to create a sustainable Canada. Its work focuses on environmental rights, climate solutions, and biodiversity. Its work on oceans includes a focus on Southern Residents and Chinook salmon.²²
19. Georgia Strait Alliance focuses on protecting and restoring the marine environment and promoting sustainability for Georgia Strait, its adjoining waters, and communities. Through its programs and initiatives, it aims to protect wildlife diversity and habitat, restore the region's water and air quality, promote sustainability of the region's communities, foster understanding of the marine environment, and promote awareness of the links between the health of ecosystems and human communities.²³
20. Raincoast Conservation Foundation is a charitable, non-profit conservation science organization empowered by their research to protect lands, waters, and wildlife of coastal British Columbia. They conduct applied, process-oriented, and hypothesis-driven research that has immediate and relevant utility for the conservation debate and the collective body of scientific knowledge.²⁴
21. The Wilderness Committee is a registered non-profit society and federal charity founded in 1980 with a head office in Vancouver and field offices in Victoria, Winnipeg and Toronto. Its mission is to protect Canada's life-giving biological diversity through strategic research and grassroots public education. Its areas of focus include defending parks, preserving

²² See David Suzuki Foundation, website, [here](#).

²³ See Georgia Strait Alliance, website, [here](#).

²⁴ See Raincoast Conservation Foundation, website, [here](#).

wilderness, protecting wildlife, fighting climate change, and safeguarding public resources.²⁵

22. The David Suzuki Foundation has retained the services of Dr. Scott Veirs to aid in its participation in the Project review. Dr. Veirs is an expert in marine bioacoustics, oceanography, and ecology of the Salish Sea. He specializes in the quantitative evaluation of acoustic impacts on marine mammals from individual and cumulative human activities. Dr. Veirs is providing scientific expertise to the David Suzuki Foundation on matters relating to the potential impacts of the Project on the acoustic environment in the Salish Sea and related impacts to Southern Residents.
23. The Wilderness Committee has also retained the services of Dr. Veirs to aid in its participation in the Project review. Dr. Veirs is providing scientific expertise to the Wilderness Committee on matters relating to the cumulative significance of potential Project effects on Southern Residents.
24. Dr. Veirs has prepared an expert report on these two subject areas which, along with his previous comments to the Review Panel, is attached to these submissions as Appendix A.
25. Raincoast Conservation Foundation has retained the services of David Scott to aid in its participation in the Project review. Mr. Scott is a fisheries biologist with a particular expertise in salmon. Mr. Scott is providing scientific expertise to the Raincoast Conservation Foundation on matters relating to potential marine shipping impacts of the Project to salmon and the effects of those impacts on the availability of salmon, as prey, for Southern Residents.
26. Mr. Scott has prepared an expert report on this subject area which, along with his previous comments to the Review Panel, is attached to these submissions as Appendix B.
27. The Georgia Strait Alliance has retained the services of Dr. Chris Kennedy to aid in its participation in the Project review. Dr. Kennedy is an aquatic toxicologist. Dr. Kennedy prepared assessments of the sufficiency and adequacy of information on various aspects of marine pollution in 2016 and 2019 for the sufficiency and technical merit review. These are attached as Appendices C, D and E.

²⁵ See Wilderness Committee, website, [here](#).

II. The legal requirements governing this environmental assessment/hearing

28. The Review Panel is tasked with conducting an environmental assessment of the Project in accordance with the requirements of CEAA 2012 and the Terms of Reference. As the Project is likely to affect federally listed wildlife species and their critical habitat, the additional mandatory provisions of s. 79 of SARA are engaged.

A. CEAA 2012 imposes requirements on the Review Panel

29. Pursuant to s. 43(1) of CEAA 2012, the Review Panel must conduct an environmental assessment, and prepare a report setting out its “rationale, conclusions and recommendations, including any mitigation measures and follow-up program”, and submit the report to the Minister.

1. The environmental assessment process

30. To comply with the requirements of CEAA 2012, the Review Panel must, in conducting its environmental assessment, consider, among other things:

- a) the environmental effects of the Project including the effects of malfunctions or accidents and any cumulative environmental effects (resulting from the project in combination with other physical activities that have been or will be carried out);
- b) the significance of those environmental effects;
- c) comments from the public;
- d) mitigation measures that are technically and economically feasible that would mitigate any significant adverse environmental effects; and
- e) the purpose and alternative means of carrying out the project.²⁶

31. The Review Panel’s report will inform the Minister’s decision under s. 52(1): whether the Project, taking into account any mitigation measures that the Minister considers appropriate, is likely to cause significant adverse environmental effects.

32. It is the Minister who ultimately decides if the Project is likely to result in significant adverse environmental effects. If the Minister so decides, then she must refer the final

²⁶ CEAA 2012, s 19.

decision on the Project to the federal Cabinet to decide whether the effects are justified in the circumstances.²⁷ No steps may be taken to proceed with the Project until this process is lawfully completed.

33. This entire process, including the Review Panel’s assessment and recommendation, must be carried out consistently with the purposes of CEAA 2012, which include:
- a) protection of the environment within federal jurisdiction from significant adverse environmental effects caused by a designated project;²⁸
 - b) ensuring that designated projects are considered in a careful and precautionary manner to avoid significant adverse environmental effects;²⁹ and
 - c) encouraging federal authorities to take actions that promote sustainable development – defined as development that meets the needs of the present, without compromising the ability of future generations to meet their own needs – in order to achieve or maintain a healthy environment and a healthy economy.³⁰
34. “Sustainable development” is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”³¹ The principle of sustainable development reflects the ecological reality that, to ensure natural systems will continue to function into the future, decision-makers must be mindful to recognize, understand, and respect system limits. Legal scholars explain that “[s]ustainable development is development that can happen within the ‘carrying capacities’ of the biosphere.”³²
35. The Review Panel’s assessment and recommendations must conform to the mandatory legal provisions of CEAA 2012.³³ Further, section 4(2) of CEAA 2012 expressly requires

²⁷ *CEAA 2012*, ss 52(2) and 52(4).

²⁸ *CEAA 2012*, s 4(1)(a).

²⁹ *CEAA 2012*, s 4(1)(b).

³⁰ *CEAA 2012*, s 4(1)(h) and s 2 definition of “sustainable development”.

³¹ Report of the World Commission on Environment and Development “Our Common Future”, GA, 42nd Sess, Annex, Agenda Item 3, UN Doc A/42/427 (1987) at p 24.

³² Natasha Affolder, “The Legal Concept of Sustainability” (Symposium on Environment in the Courtroom: Key Environmental Concepts and the Unique Nature of Environmental Damage, 23-24 March 2012) (Calgary: Canadian Institute of Resources Law, University of Calgary, 2012), online: <https://cir.l.ca/files/cirl/natasha_affolder-en.pdf>, PDF p 6.

³³ *Tsleil-Waututh Nation v Canada (Attorney General)*, 2018 FCA 153.

the Review Panel to exercise its powers and fulfill its responsibilities under the Act in a manner that protects the environment and applies the precautionary principle.³⁴

2. Terms of Reference

36. The Terms of Reference for this Review Panel state that “[t]he Review Panel may receive and take into account information with respect to whether any significant adverse environmental effects may be justified in the circumstances.”³⁵
37. If the Review Panel concludes that the Project is likely to result in significant adverse environmental effects, it “may include in its report information that it has received with respect to whether those significant adverse environmental effects are justified in the circumstances.”³⁶

3. The meaning of certain key environmental assessment terms

38. Mitigation measures are defined in s. 2 of CEAA 2012 as “measures for the elimination, reduction or control of adverse environmental effects, and includes restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means”.
39. Mitigation measures are intended to be actual, identifiable measures which will eliminate, reduce, or control adverse effects of a project. Courts have been clear that “vague hopes for future technology” to address effects do not constitute mitigation measures.³⁷ Vague assurances of adaptive management, further study, and conceptual and unproven ideas do not constitute mitigation measures.³⁸
40. The Review Panel is required to take into account the requirements of any follow up programs that might be identified as part of the environmental assessment process. The clear intent of CEAA 2012 is that follow-up programs will determine the effectiveness of mitigation that has actually been implemented, not substitute for it. Subsection 19(1)(e) requires environmental assessments to take into account “the requirements of the follow-up

³⁴ CEAA 2012, s 4(1) and (2).

³⁵ Document # 176, “Final Review Panel Terms of Reference –Version Amended April 22” (17 April 2015) [2015 *Final Terms of Reference*], [here](#), s 3.4.

³⁶ Document # 176, 2015 *Final Terms of Reference*, s 4.29.

³⁷ *Pembina Institute for Appropriate Development v Canada (Attorney General)*, 2008 FC 302 at para 25.

³⁸ *Taseko Mines Limited v Canada (Environment)*. 2017 FC 1099 [*Taseko*] at paras 101, 122-124. This decision is currently under appeal.

program”, which is defined in s. 2 as “a program for (a) verifying the accuracy of the environmental assessment and (b) determining the effectiveness of any mitigation measures.”

41. Significance is not defined in CEAA 2012. Canadian Environmental Assessment Agency policy identifies the key criteria as magnitude, geographic extent, timing, frequency, duration and reversibility.³⁹ SARA policy adds that, for the purposes of assessing the “significance” of adverse effects on SARA-listed species, “the status of species at risk should be taken into consideration.”⁴⁰
42. With respect to the significance of the effects on marine species, the Proponent has defined a significant adverse effect as one that “1. Affects one or more individuals; or 2. Results in a change to critical habitat such that a feature would not be available when needed for a life function, either to the extent which could jeopardise survival or recovery of the species.”⁴¹
43. The Conservation Coalition submits that jeopardizing survival or recovery is too high a threshold for significance under CEAA 2012. An effect need not jeopardize survival or recovery of a species to be considered a significant effect. To the extent that any relevant policy documents suggest otherwise, they are not consistent with CEAA 2012 and SARA, and should not be followed.
44. The Federal Court recently made an instructive decision in the context of the Minister of Fisheries and Oceans’ interpretation of a provision of the Fishery General Regulation under the *Fisheries Act* that refers to diseases that “may be harmful to the conservation and protection of fish.”⁴² The Court held that the Minister’s interpretation “appears to impose a threshold or ‘level’ of potential harm that essentially permits any transfer of fish having a disease or disease agent unless the transfer places genetic diversity, species or conservation

³⁹ Canadian Environmental Assessment Agency, “Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under CEAA 2012” (November 2015), online: <https://www.canada.ca/en/environmental-assessment-agency/news/media-room/media-room-2015/determining-whether-designated-project-is-likely-cause-significant-adverse-environmental-effects-under-ceaa-2012.html>.

⁴⁰ Environment Canada and Parks Canada, “Addressing Species at Risk Act Considerations under the Canadian Environmental Assessment Act for Species under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada”, (Ottawa: Government of Canada, 2010) [*SARA Policy*], see CCR, Volume 2, Appendix F, PDF p 293.

⁴¹ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 260.

⁴² *Morton v Canada (Fisheries and Oceans)*, 2019 FC 143 [*Morton*].

units of fish at risk.”⁴³ The Court held that this was not consistent with the DFO’s Wild Salmon Policy⁴⁴ and was unreasonable.⁴⁵ This interpretation would allow a “high level of potential harm”, and it could affect “the genetic characteristics of fish or fish stocks” through “diminished numbers.”⁴⁶ The interpretation “defeats the actual purpose of, and conflicts with [the Wild Salmon Policy definition of conservation] by incorporating a level or magnitude of potential harm at the species or conservation unit level” before the Regulation precludes a transfer.⁴⁷ The Court held that this is inconsistent with the purpose of the provision and with the Minister’s obligation under the *Fisheries Act* to conserve the resource.

45. The Conservation Coalition submits that the same principles apply to the interpretation of significance under CEAA 2012, both in the fisheries context and in the context of SARA-listed species. As noted above, s. 4(1)(b) of CEAA 2012 requires a “careful and precautionary” approach to environmental assessment. As noted below, the purpose of SARA is to not only prevent extinction, but also promote recovery of species.⁴⁸ Both in the context of fisheries to which the Wild Salmon Policy applies, and SARA-listed species, it would not be careful and precautionary to only consider effects as significant in an environmental assessment if they will have conservation unit or population-level effects, which jeopardize the species’ ongoing viability or its recovery. This is too high a threshold.
46. “Justified in the circumstances” is not defined in CEAA 2012. Dictionary definitions of “justified” include: having a good reason for something;⁴⁹ to prove or show to be just, right or, reasonable; to show to have had a sufficient legal reason.⁵⁰ In case law interpreting the equivalent provision in the previous *Canadian Environmental Assessment Act*, the Federal

⁴³ *Morton* at para 125.

⁴⁴ Fisheries and Oceans Canada, “Canada’s Policy for Conservation of Wild Pacific Salmon” (2005), online: <<https://waves-vagues.dfo-mpo.gc.ca/Library/315577.pdf>>.

⁴⁵ *Morton* at para 125.

⁴⁶ *Morton* at para 141.

⁴⁷ *Morton* at para 146.

⁴⁸ *Species at Risk Act*, SC 2002, c 29, s 6 [*SARA*].

⁴⁹ English Oxford Living Dictionaries, online edition, *sub verbo* “justified”, online: <https://en.oxforddictionaries.com/definition/justified>.

⁵⁰ Cambridge Dictionary, online edition, *sub verbo* “justified”, online: <https://dictionary.cambridge.org/dictionary/english/justified>.

Court defined justification as a balancing of adverse environmental effects against social, economic and other non-environmental benefits. The Conservation Coalition submits that the requirements of other federal laws and Canada’s international commitments are also among the “circumstances” relevant to the justification analysis; any decision under a federal statute may be challenged in Federal Court if it is “contrary to law”.⁵¹

47. As discussed further below, the Project will cause significant adverse environmental effects. The Conservation Coalition will take a final position on these matters in their closing remarks, after the evidentiary record is closed. However, it is clear based on the record so far that the Project will have significant adverse environmental effects, and, based on the record thus far, the Conservation Coalition expects to take the position in its closing remarks that these effects cannot be effectively mitigated, and that they are not justified in the circumstances.

B. SARA imposes additional legal requirements on the Review Panel

48. Because the Project will affect SARA-listed species, including the Southern Residents, section 79(2) of SARA imports additional requirements into the environmental assessment and imposes additional, heightened legal obligations on the Review Panel. Specifically, pursuant to s. 79(2) of SARA, the Review Panel must also ensure measures to avoid or lessen the Project’s adverse effects on the species that the Agency has identified as likely to be affected by the Project.⁵² The Review Panel must meet these obligations to lawfully complete the environmental assessment.
49. The Conservation Coalition submits that these requirements further constrain the Review Panel’s recommendations to the Minister, if the adverse effects of the Project cannot be effectively mitigated. Further, the Review Panel cannot recommend the Project if its adverse effects will further jeopardize survival and recovery of a SARA-listed species.

⁵¹ *Federal Courts Act*, RSC, 1985, c F-7, s 18.1(4)(f).

⁵² Identified in Document #51, *SARA Project Notification*, [here](#).

50. The purposes of SARA include preventing wildlife species from being extirpated or becoming extinct, and providing for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity.⁵³
51. SARA creates a scheme to ensure the fulfillment of these purposes⁵⁴ in which s. 79 plays an integral role. Section 79 works with the other protective provisions in SARA to protect listed wildlife species from existing threats and to ensure that the adverse effects of new activities do not exacerbate pre-existing problems or create new problems for already struggling species, in order to prevent extinction and allow for recovery.
52. The content of the s. 79(2) duty is clear on the plain language of the provision. Section 79(2) of SARA applies when a project that is being reviewed under CEAA 2012 is likely to affect a listed species or its critical habitat.⁵⁵ These requirements apply for all federally protected species that are likely to be affected by the Project, including, but not limited to, the Southern Residents. Section 79(2) establishes:
- a. a requirement for the Review Panel to ensure that the environmental assessment identifies all adverse effects of the Project on a listed wildlife species and its critical habitat, and, if the Project is carried out, further requirements to ensure that those effects are both mitigated and monitored;
 - b. a requirement for the Review Panel to ensure that measures are taken to avoid or lessen all “adverse effects” of the Project on listed wildlife species and critical habitat, regardless of the significance of those effects; and
 - c. a requirement that, if a recovery strategy or action plan exists for the species, the measures must be taken in a way that is consistent with that recovery strategy or action plan.
53. The above interpretation is consistent with an Environment Canada policy for Addressing Species at Risk Act Considerations under the Canadian Environmental Assessment Act (the “SARA Policy”).⁵⁶ The SARA Policy clearly states that s. 79 obligations are in

⁵³ SARA, s 6.

⁵⁴ *David Suzuki Foundation v Canada (Fisheries and Oceans)*, 2010 FC 1233 at para 13.

⁵⁵ SARA, s 79(1).

⁵⁶ *SARA Policy*, CCR, Volume 2, Appendix F, PDF pp 251, 259-262, 280-283, 288-290.

addition to the requirements of CEAA 2012, and that they apply regardless of the significance of the effects on SARA-listed species.⁵⁷ Notification is required for listed species, and encouraged for other COSEWIC species under consideration for listing.⁵⁸ The SARA Policy also states that “[t]he status of [a] species at risk should be taken into consideration when determining the significance of adverse effects.”⁵⁹ While the SARA Policy dates from 2010, the Conservation Coalition submits that it is still relevant, as it is the only Government of Canada operational policy statement that addresses s. 79 of SARA.

54. Further, under SARA, no agreements, permits, or authorizations can issue for the harming of a listed species or its critical habitat that would the jeopardize survival and recovery of the species.⁶⁰
55. Once listed as endangered or threatened under SARA, individuals of a listed aquatic species are automatically protected from harm.⁶¹ Section 32(1) of SARA prohibits the killing, harming harassing, capturing or taking an individual of listed wildlife species, and their residences are also protected from damage or destruction.⁶²
56. Once critical habitat is identified for aquatic species, it must be legally protected from destruction either under SARA or other laws of Canada.⁶³ Section 58(1) of SARA makes it an offence to destroy any part or biological attribute of critical habitat of an aquatic species. Section 58(1) applies in the case of the Southern Residents through the operation of the *Southern Resident Critical Habitat Protection Order*.⁶⁴
57. Destruction of critical habitat is not defined in SARA. The Proponent uses a definition, drawn from a DFO document, that critical habitat is destroyed “if part of the critical habitat is degraded, either permanently or temporarily, such that its biophysical features would not be available when needed by SRKWs for foraging, mating, resting, or socialising”.⁶⁵

⁵⁷ *SARA Policy*, CCR, Volume 2, Appendix F, PDF pp 253, 256-257.

⁵⁸ *SARA Policy*, CCR, Volume 2, Appendix F, PDF p 253.

⁵⁹ *SARA Policy*, CCR, Volume 2, Appendix F, PDF p 293.

⁶⁰ *Canada v David Suzuki Foundation*, 2012 FCA 40, at paras 121, 122, 124, 125.

⁶¹ *SARA*, s 32(1).

⁶² *SARA*, s 2 definition of “residence”, s 33.

⁶³ *SARA*, ss 57, 58(5).

⁶⁴ *Critical Habitat Order*.

⁶⁵ Document #181, *EIS*, Volume 3, Section 14.1.1.1, [here](#), PDF p 468.

58. SARA permits for activities affecting protected wildlife species or their residences or critical habitat may only issue if three statutory preconditions are met:
- a) all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted;
 - b) all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals; and
 - c) the activity will not jeopardize the survival or recovery of the species.⁶⁶
59. The Conservation Coalition submits that the Review Panel cannot reasonably recommend a decision under CEAA 2012 that would violate the purpose or provisions of SARA.

C. The Review Panel's interpretation of its duties must be consistent with Canada's international commitments

60. Environmental legislation should also be interpreted and applied consistently with Canada's international commitments. It is presumed that Canadian domestic law is meant to comply with Canada's international commitments and should be interpreted consistently with them; interpretations of Canadian law that would put Canada in breach of its international commitments should therefore be avoided.⁶⁷ The Project is likely to have adverse effects on matters covered by existing international agreements and commitments made by Canada including with respect to: biodiversity, salmon, sustainable development, and climate change.

1. United Nations Convention on the Conservation of Biological Diversity

61. Providing legal protection for species at risk through SARA is intended to meet Canada's commitments under the *United Nations Convention on the Conservation of Biological Diversity* ("*Convention on Biological Diversity*").⁶⁸ Thus, the *Convention on Biological Diversity* is part of the context to consider in interpreting SARA. An interpretation of SARA that does not conform to it could put Canada in breach of it.⁶⁹

⁶⁶ SARA, s 73.

⁶⁷ *R v Hape*, 2007 SCC 26 at paras 53-56; Ruth Sullivan, *Sullivan on the Construction of Statutes*, 5th ed (Markham: LexisNexis Canada Inc, 2008), pp 538-543.

⁶⁸ SARA, preamble.

⁶⁹ *Environmental Defence Canada v Canada (Fisheries and Oceans)*, 2009 FC 878 at paras 38-39.

62. The preamble of the *Convention on Biological Diversity* affirms that the conservation of biological diversity is a “common concern of humankind” and confirms that the parties (including Canada), in ratifying the *Convention on Biological Diversity*, are determined to conserve biological diversity for the benefit of present and future generations. The *Convention on Biological Diversity*’s first objective is the conservation of biological diversity.⁷⁰ The requirements of s. 79 must be interpreted consistently with this objective.

2. Pacific Salmon Treaty

63. Through the Pacific Salmon Treaty, signed in 1985, Canada and the United States agree to cooperate in the management, research and enhancement of Pacific salmon stocks of mutual concern – including several stocks that will be affected by the Project. Taking into account the decline in abundance and productivity of important naturally spawning stocks of Pacific salmon and the role habitat loss has played in that decline, provisions were added to the treaty in 1999 and reconfirmed in 2019. Through these provisions on Habitat and Restoration the parties agree to protect habitat to promote the safe passage of adult and juvenile salmon and also to maintain safe passage of salmon to and from their natal streams.⁷¹
64. Canada’s commitment to protect salmon habitat and ensure safe passage of juvenile salmon is relevant to assessing the potential significance of the Project’s impacts on salmon habitat in the Fraser River estuary.

3. United Nations Framework Convention on Climate Change

65. In 1992, the *United Nations Framework Convention on Climate Change* (the “UNFCCC”) was adopted.⁷² The core objective of the UNFCCC is “the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic

⁷⁰ *United Nations Convention on the Conservation of Biological Diversity*, 5 June 1992, 1760 UNTS 69 (entered into force 29 December 1993), [*Convention on Biological Diversity*], Article 1.

⁷¹ Pacific Salmon Commission, *Treaty Between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon (including amendments provisionally applied as of January 1, 2019)* (January 2019), online: <<https://www.psc.org/download/45/miscellaneous/2337/treaty.pdf>>, PDF p 121.

⁷² *United Nations Framework Convention on Climate Change*, 9 May 1992, 1171 UNTS 107 (ratified by Canada 4 Dec 1992, entered into force 21 March 1994) [*UNFCCC*].

interference with the climate system.”⁷³ The preamble to the UNFCCC acknowledges that climate change is “a common concern of humankind.”⁷⁴

66. In December 2015, the parties to the UNFCCC reached the Paris Agreement.⁷⁵ The Paris Agreement Adoption Decision recognizes “that climate change represents an urgent and potentially irreversible threat to human societies and the planet and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions”.⁷⁶
67. The Paris Agreement Adoption Decision further recognizes “that deep reductions in global emissions will be required in order to achieve the ultimate objective of the Conventions” and “*emphasiz[es]* the need for urgency in addressing climate change”.⁷⁷
68. The Paris Agreement Adoption Decision emphasizes “with serious concern the urgent need to address the significant gap between the aggregate effect of Parties’ mitigation pledges in terms of global annual emissions of greenhouse gases by 2020 and aggregate emission pathways consistent with holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels”.⁷⁸
69. The Paris Agreement aims to hold “the increase in global average temperature to well below 2°C above pre-industrial levels” and to pursue efforts to limit the increase to 1.5°C.⁷⁹
70. The objective and aim of the UNFCCC and Paris Agreement and Canada’s international commitments to address climate change should inform the Review Panel’s assessment of whether the effects of GHG emissions attributable to the Project or Project Related Shipping should be deemed “significant”.

⁷³ UNFCCC, Art 2.

⁷⁴ UNFCCC, preamble, para 1.

⁷⁵ Framework Convention on Climate Change, Adoption of the Paris Agreement, FCCC Dec 1/CP.21, FCCC, 21st Sess, UN Doc FCCC/CP/2015/10/Add.1 [*Paris Agreement Adoption Decision*].

⁷⁶ *Paris Agreement Adoption Decision*, preamble, para 5.

⁷⁷ *Paris Agreement Adoption Decision*, preamble, para 6.

⁷⁸ *Paris Agreement Adoption Decision*, preamble, para 9.

⁷⁹ *Paris Agreement Adoption Decision*, annex, Paris Agreement, Art 2.

III. Evidence of Adverse Environmental Effects of the Project

71. While the Project is expected to have wide ranging effects on federal areas of environmental responsibility, the Conservation Coalition will focus these submissions on three categories of impacts: (A) the impacts of Project Related Shipping on the marine environment, and in particular the impact on SARA-listed marine species including the Southern Residents; (B) the impacts of the Project on salmon and salmon habitat in the Fraser River estuary; and (C) the marine GHGs from Project Related Shipping calling at the terminal.
72. The Conservation Coalition rely on the following expert reports, summarized in the discussion below, which are appended to these submissions:
 - a) A report by Dr. Scott Veirs (the “Veirs Report”) the potential cumulative effects of the Project on Southern Resident Killer Whale including the effects of Project Related Shipping on the acoustic quality of the whales’ critical habitat. The Veirs Report, along with Dr. Veirs’ previous comments to the Review Panel, is Appendix A to these submissions.
 - b) A Report by fisheries biologist David Scott (the “Scott Report”) on the potential effects of the Project on salmon habitat in the Fraser River and on already struggling populations of Chinook salmon. The Scott Report, along with David Scott’s previous comments to the Review Panel, is Appendix B to these submissions; and
 - c) The 2015, 2016 and 2019 reports of Dr. Scott Kennedy (the “Kennedy Reports”) on the quality and sufficiency of information before the Review Panel about the Project’s effects on marine pollution. The Kennedy Reports are already filed on the record at Documents #363, #641, and #1441 as part of the Conservation Coalition’s submissions on completeness, sufficiency and technical merit.⁸⁰ Dr. Kennedy’s Reports are also attached as Appendices C, D and E;

⁸⁰ Document #363, “From Ecojustice to the Canadian Environmental Assessment Agency re: Comment on the Completeness of the Marine Shipping Addendum” (2 July 2015), Comments of Dr. Chris Kennedy [2015

d) The Summary for Policy Makers of the October 2018 Global Warming of 1.5°C An IPCC Special Report on the Impacts of Global Warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty by the Inter-Governmental Panel on Climate Change. The IPCC Report is attached as Appendix Q.

73. The Conservation Coalition also rely on other information relevant to the Project’s effects on the Southern Residents, salmon and salmon habitat, and greenhouse gas emissions, cited below.
74. The evidence before the Review Panel, including that filed by the Conservation Coalition, the Proponent, and DFO, is that if the Project is approved it will have significant adverse environmental effects.

A. Effects of Project Related Shipping on SARA-listed marine species, including the Southern Residents

75. The Proponent estimated in the EIS that there would be 260 ship calls, equivalent to 520 ship movements, per year when the terminal is at full capacity by 2030.⁸¹
76. A new study filed in 2018 projects that if the Project is built, due to increasing vessel size, the total number of vessel calls in the Port of Vancouver will not increase, but that vessel calls at Roberts Bank will increase.⁸² Underwater noise impacts of these larger vessels was not assessed in the EIS or Marine Shipping Addendum. The Proponent stated on February 22, 2019 that “further evaluation of underwater noise is underway”. The Conservation Coalition notes that this timing is unhelpful in light of the timing of the written

Kennedy Report], CCR, Volume 2, Appendix C; Document #641, “From Ecojustice on behalf of Western Canada Wilderness Committee, Raincoast Conservation Foundation, David Suzuki Foundation, and the Georgia Strait Alliance to the Review Panel re: Comments on the information relating to the environmental assessment of the Roberts Bank Terminal 2 Project.” (28 October 2016), Comments of Dr. Chris Kennedy [*2016 Kennedy Report*], CCR, Volume 2, Appendix D; Document #1441, “From Ecojustice on behalf of the David Suzuki Foundation, Georgia Strait Alliance, Raincoast Conservation Foundation, and the Wilderness Committee to the Review Panel re: Comments on the Sufficiency of Information” (8 February 2019), Comments of Dr. Chris Kennedy [*2019 Kennedy Report*], CCR, Volume 2, Appendix E.

⁸¹ Document #181, *EIS*, Volume 1, Sections 1.0-7.0 [here](#), PDF p 97.

⁸² Document #1473, “From the Vancouver Fraser Port Authority to the Review Panel re: Response to Undertaking #2 from the January 30, 2019 Information Session (See Reference Document #1428)”, [here](#).

submissions deadline and the timing of the public hearing; they and their experts have had to work with incomplete and changing information.

77. The Proponent has modelled ships travelling at an average of 20 knots.⁸³ The Proponent states that this is the average for container ships in the relevant area, which have a maximum speed of 25 knots, and stated that the Pacific Pilotage Authority advised that container ships typically travel at 18 to 25 knots, conditions permitting.⁸⁴
78. Once constructed the Project would operate indefinitely.⁸⁵
79. The Conservation Coalition makes submissions below concerning effects on (1) Southern Residents, (2) Humpback Whales, and (3) other SARA-listed marine species.

1. Effects on the Southern Residents

(i) Southern Residents

80. Effects on the Southern Residents are addressed in the Veirs Report (Appendix A) in addition to the following submissions.
81. The Southern Residents are a critically endangered population of killer whale that reside seasonally in the Salish Sea. The Center for Whale Research, which conducts an annual population census and tracks births and deaths between censuses, confirms that there are 75 Southern Residents as of January 2019, assuming the calf born in December 2018 survives.⁸⁶
82. As described in more detail below, the Project site is in Southern Resident critical habitat, and the vessel traffic aspect of the Project will transit through critical habitat. Further, the Project is likely to affect Chinook salmon, the primary prey of the Southern Residents. The Project is expected to exacerbate four key threats that are affecting the Southern Residents ability to survive and recover: (a) physical and acoustic disturbance from ships, (b) prey availability, (c) marine environmental pollution, (d) vessel strikes, and (e) oil spills.

⁸³ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 255.

⁸⁴ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 28.

⁸⁵ Document #181, *EIS*, Volume 1, EIS Sections 1.0-7.0 [here](#), PDF p 70.

⁸⁶ Center for Whale Research, "Population" (accessed 11 April 2019), online: <https://www.whaleresearch.com/orca-population>, CCR, Volume 2, Appendix G.

83. The Project will also contribute to the cumulative pressure on the Southern Residents and their critical habitat from a multitude of human activities in the busy Salish Sea, which experts have already found to be more than the species can handle over the long term.⁸⁷
84. Recent trends in the Southern Resident population are cause for concern.⁸⁸ The Veirs Report notes that body condition is poor in many individuals, and notes the “elevated level of unsuccessful pregnancies” and its likely connection with inadequate food for reproductive females; reproductive failure associated with poor body condition has been documented by researchers.⁸⁹ In recent years the Southern Resident population has lost seemingly healthy, reproductive-aged individuals, and since 2015 it has not produced any surviving calves, until the birth in December 2018 of a calf, L124, that is currently still alive.⁹⁰ Following the birth of six calves from December 2014 to 2016, the Southern Residents have suffered a series of setbacks, and births have been more than offset by deaths. Four of those six calves have since died, no surviving calves have been born since 2015, and one pod, K-pod, has not had a surviving calf since 2011. The Veirs Report explains the “worrisome” loss of nearly 20 per cent of reproductive-aged females since 2014.⁹¹ In 2016, two post-reproductive females died⁹², including the population’s matriarch, as well as two adult males, one of whom was killed by blunt force trauma consistent with a vessel strike.⁹³ In 2018, there were three documented mortalities: a 23-

⁸⁷ *Veirs Report*, Volume 2, Appendix A, PDF pp 7-8.

⁸⁸ Births and deaths are documented by the Center for Whale Research and Orca Network: Center for Whale Research, “2017 SRKW Census-July1” (2017), online: <<https://simplebooklet.com/publish.php?wpKey=HiPDDCYGTuXh2pyNPxHwB6#page=1>>, CCR, Volume 2, Appendix H, PDF pp 325; Orca Network, “Southern Resident Orca Community Demographics, Composition of Pods, Births and Deaths since 1998” (23 September 2017), online: <http://www.orcanetwork.org/Main/index.php?categories_file=Births%20and%20Deaths>, CCR, Volume 2, Appendix I, PDF pp 328-330. The *Imminent Threat Assessment* includes numbers current to 2017.

⁸⁹ *Imminent Threat Assessment*, CCR Volume 2, Appendix R.

⁹⁰ Lynda Mapes, “New orca calf seen among Puget Sound’s critically endangered killer whales”, *Seattle Times* (14 January 2019), online: <<https://www.seattletimes.com/seattle-news/environment/new-orca-calf-spotted-among-puget-sounds-critically-endangered-killer-whales/>>, CCR, Volume 2, Appendix J.

⁹¹ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 8.

⁹² Laanela, Mike, “Orca ‘Granny’ missing and presumed dead”, *CBC News* (03 January 2017), online: <<http://www.cbc.ca/news/canada/british-columbia/orca-j2-granny-dead-killer-whale-1.3919060>>, CCR, Volume 2, Appendix K.

⁹³ “Orca found on Sunshine Coast died of blunt force trauma, DFO says”, *CBC News* (22 December, 2016), online: <<http://www.cbc.ca/news/canada/british-columbia/orca-death-b-c-1.3909858>>, CCR, Volume 2, Appendix L.

year-old male died⁹⁴; a nearly 4-year-old female died following a decline in body condition and possible illness, despite intervention endorsed by the American and Canadian governments; and a whale gave birth to a calf that died the same day, and proceeded to mourn the calf by carrying it for 17 days.⁹⁵

85. A peer-reviewed population viability analysis for the Southern Residents published in 2017 by Lacy et al., co-authored by Misty MacDuffee and Paul Paquet of Raincoast, and cited in the Veirs Report, shows that the Southern Residents will not recover under current conditions, and will slowly decline towards extinction if threats are increased. Notably, the Veirs Report states that Lacy et al. 2017 may be overly optimistic, given the recent developments in the Southern Resident population.⁹⁶ The Veirs Report also cites a recent National Marine Fisheries Service status review that makes a more pessimistic projection, including a “red line” scenario involving an “immediate and precipitous” decline; Dr. Veirs is of the opinion that the Southern Residents are currently in this “red” zone, and that preventing extinction requires “bold reductions” in impacts on Southern Residents.⁹⁷
86. The federal government’s May 2018 Southern Resident Killer Whale Imminent Threat Assessment (the “Imminent Threat Assessment”) described the Southern Resident population as “small, not stable and declining” and stated that “the current demographic distribution of the population does not support the recovery goals identified in the 2011 Recovery Strategy.”⁹⁸ This document also described new research identifying concerning trends. For example, a review of recent research in 2017 by Matkin et al. identified poor body condition in the Southern Residents which was associated with the loss of fetuses, calves and adults.⁹⁹ The Imminent Threat Assessment also identified population viability

⁹⁴ Center for Whale Research, “L92”, online: <<https://www.whaleresearch.com/192>>, CCR, Volume 2, Appendix M.

⁹⁵ National Oceanic and Atmospheric Administration, Fisheries, West Coast Region, “Updates on Southern Resident Killer Whales J50 archive”, “J35 Updates”, online: <https://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/killer_whale/status-j50-archive.html>, CCR, Volume 2, Appendix N; Lynda Mapes, “New orca calf seen among Puget Sound’s critically endangered killer whales”, *Seattle Times* (14 January 2019), online: <<https://www.seattletimes.com/seattle-news/environment/new-orca-calf-spotted-among-puget-sounds-critically-endangered-killer-whales/>>, CCR, Volume 2, Appendix J.

⁹⁶ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 8.

⁹⁷ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 9.

⁹⁸ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, PDF pp 482, 489.

⁹⁹ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, PDF p 474.

analyses, including Lacy et al. 2017, which predict poor trajectories for the population under various scenarios.¹⁰⁰

87. The Proponent incorrectly states that the cause of the Southern Residents' lack of recovery is "unknown".¹⁰¹ The Imminent Threat Assessment, identifying the threats of "reductions in the availability or quality of prey, physical and acoustic disturbances, and environmental contaminants", states that:

Individually these threats, especially prey availability, have been demonstrated to limit or reverse the recovery of SRKW. The cumulative effect of these threats is unknown but they may work synergistically. Each threat independently impacts the health or the foraging ability of SRKW. Acoustic and physical disturbance, both acute and chronic effects, may affect the success of foraging. The synergistic effects of the combination of threats may exacerbate the impacts of each threat and shorten the timeframe for population impacts.¹⁰²

(ii) Southern Resident critical habitat

88. Critical habitat is defined under SARA as the habitat necessary for a species' survival or recovery.¹⁰³ Further, SARA defines habitat for aquatic species at risk as "spawning grounds and nursery, rearing, food supply, migration and any other area on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced."¹⁰⁴
89. The Federal Court has confirmed that, in the case of Southern Residents, critical habitat includes not only an area but also the biological properties that make it useful for the whales, including the availability of Chinook salmon, the environmental quality of the water and the physical and acoustic quality of the water.¹⁰⁵
90. Partial critical habitat was identified for Southern Residents in 2008.¹⁰⁶ These areas included the transboundary waters of the Salish Sea in southern BC, including the southern

¹⁰⁰ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, PDF pp 479-480.

¹⁰¹ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 270.

¹⁰² *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, PDF p 477.

¹⁰³ *SARA*, s 2(1).

¹⁰⁴ *SARA*, s 2(1).

¹⁰⁵ *David Suzuki Foundation v Canada (Fisheries and Oceans)*, 2010 FC 1233 at paras 337-339; affirmed in *Canada v David Suzuki Foundation*, 2012 FCA 40.

¹⁰⁶ Document #1374, *2018 Recovery Strategy*, Document #1374, "From Fisheries and Oceans Canada to the Review Panel re: Recovery Strategy for the Northern and Southern Resident Killer Whales (*Orcinus orca*) in Canada" (12 December 2018) [*2018 Recovery Strategy*], [here](#), PDF p 55.

Strait of Georgia, Haro Strait, and the Juan de Fuca Strait. These areas of critical habitat were protected by a critical habitat protection order under SARA in 2009.¹⁰⁷ The Southern Resident regional assessment area (“RAA”) in the Proponent’s EIS includes this area of critical habitat.¹⁰⁸

91. Based on new information, the revised 2018 Recovery Strategy identifies a new area of critical habitat for Northern and Southern Residents off the entrance to Juan de Fuca Strait, on the continental shelf off southwestern Vancouver Island, including Swiftsure and La Pérouse Banks; this area is used by both Northern and Southern Residents throughout most of the year.¹⁰⁹ This area is “a contiguous westward extension” of previously identified critical habitat, and its “southern boundary is formed by the Exclusive Economic Zone of Canada”.¹¹⁰ This area is not included in the Southern Resident RAA in the EIS and has not been fully addressed by the Proponent.¹¹¹ Project Related Shipping would transit through this area.
92. All areas of Southern Resident critical habitat are protected under the *Critical Habitats of the Killer Whale (Orcinus orca) Northeast Pacific Southern Resident Population Order*.¹¹² Through this order it is an offence under SARA to destroy any part or identified attribute of Southern Resident critical habitat.¹¹³

(iii) Threats to Southern Residents and their critical habitat

93. Physical and acoustic disturbance, reduced prey availability, marine pollution, and vessel strikes are all identified as key threats to the survival and recovery of Southern Residents and to the integrity and function of their critical habitat. The Project will likely adversely affect all of these threats.

¹⁰⁷ Document #1374, *2018 Recovery Strategy*, [here](#), PDF pp 55-56.

¹⁰⁸ Document #919, *DFO Technical Review*, [here](#), PDF p 6.

¹⁰⁹ Document #1374, *2018 Recovery Strategy*, [here](#), PDF p 58.

¹¹⁰ Document #1374, *2018 Recovery Strategy*, [here](#), PDF p 59.

¹¹¹ Document #919, *DFO Technical Review*, [here](#), PDF pp 15-17.

¹¹² *Critical Habitat Order*.

¹¹³ *SARA*, s 58(1)

94. Each of these threats can adversely affect the Southern Residents. Unfortunately, these threats combined act synergistically to have an even greater negative impact.¹¹⁴ For example, vessel noise exacerbates the impacts of food scarcity caused by declining abundance of the Southern Residents' preferred prey, Chinook salmon. When nutritionally stressed whales metabolize fat, it releases toxins into their bodies which compromise immune function and make them more vulnerable to disease.
95. The Imminent Threat Assessment highlights particular challenges faced by small populations. Small population size "heightens the implications of any mortality and resulting loss of reproductive potential."¹¹⁵ It further identifies the fact that small populations have a greater likelihood of inbreeding and lower reproductive rates, resulting in "low genetic variability, reduced resilience against disease and pollution, reduced population fitness, and elevated extinction risks due to catastrophic events."¹¹⁶ The Southern Residents are vulnerable to population-level effects from random events, such as a vessel strike, oil spill, or poor Chinook year.
96. Existing conditions in the Salish Sea are already threatening Southern Resident survival and recovery. The Imminent Threat Assessment concluded that the Southern Residents are likely facing imminent threats to their survival and recovery, that "[i]ntervention [...] is needed now in order to preserve the current population to allow the [Southern Residents] the best chance for survival and recovery", and that "[u]nless mitigated, the current threats may make survival of the population unlikely or impossible."¹¹⁷
97. With respect to current government activities aimed at abating the prey and disturbance threats, the Imminent Threat Assessment states that "the key threats affecting the [Southern Resident] population are not, to date, being fully abated; further, the effectiveness of these

¹¹⁴ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, p 477; Robert C Lacy, Rob Williams, Erin Ashe, Kenneth C Balcomb III, Lauren J N Brent, Christopher W Clark, Darren P Croft, Deborah A Giles, Misty MacDuffee & Paul C Paquet, "Evaluating Anthropogenic Threats to Endangered Killer Whales to Inform Effective Recovery Plans" (2017) 7 *Scientific Reports* Article 14119 [*Lacy et al*] See CCR, Volume 2, Appendix S, page 500.

¹¹⁵ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, page 478.

¹¹⁶ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, page 479.

¹¹⁷ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, PDF p 489.

actions has not yet been evaluated.”¹¹⁸ Additionally, the Imminent Threat Assessment cautions that “current actions are relatively new and their success in reducing and eliminating the threats posed by acoustic and physical disturbance have not been evaluated for their effectiveness in promoting survival and recovery”.¹¹⁹

98. The Project would add to the anthropogenic stressors threatening the Southern Residents’ survival. The Project will also adversely affect the whale’s primary prey, Chinook salmon. The Southern Residents’ survival is already threatened by status quo conditions, and Lacy et al. 2017 demonstrates how increased threats will cause the population to decline.¹²⁰

(a) Physical and acoustic disturbance of Southern Resident and their critical habitat

99. Shipping affects marine mammals including the Southern Residents in two different ways: through underwater noise causing acoustic disturbance that interrupts echolocation and communication calls, and through physical disturbance that disrupts whales from their current state or activity.
100. Acoustic disturbance has been recognized for years as one of the main threats to the Southern Residents. As explained in the Veirs Report, for marine mammals such as the Southern Residents, the ability to hear is as important as the human ability to see.¹²¹ Southern Residents rely on their ability to hear sound to carry out their basic life processes, such as communication, foraging, and navigation.¹²²
101. Unfortunately, the acoustic environment of the Salish Sea is “highly polluted” with chronic noise pollution from shipping and of “poor ‘acoustic environmental quality’”.¹²³ As explained in the Veirs Report, the Salish Sea is already the “most polluted acoustic environment on the B.C. coast.”¹²⁴ The Southern Residents’ critical habitat is already too loud for the species, and recovery requires reducing current noise levels.¹²⁵

¹¹⁸ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, PDF p 488.

¹¹⁹ *Imminent Threat Assessment*, CCR, Volume 2, Appendix R, PDF p 486.

¹²⁰ *Lacy et al*, CCR, Volume 2, Appendix S, PDF pp 501-504.

¹²¹ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 13.

¹²² *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 13.

¹²³ *Veirs Report*, CCR, Volume 2, Appendix A, PDF pp 10-13.

¹²⁴ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 12.

¹²⁵ *Veirs Report*, CCR, Volume 2, Appendix A, PDF pp 15, 21-22, 24.

102. Container ships currently make up about 20 per cent of traffic in Southern Resident critical habitat, and are the fastest class of ships, with the most intense source levels.¹²⁶ Furthermore, the frequencies of ship noise overlap with Southern Residents' signals, at times and in locations that affect Southern Residents.¹²⁷ Container ships emit sounds at frequencies that overlap with Southern Residents' hearing and their calls and echolocation clicks, all of which are relevant to foraging.¹²⁸ Vessel noise can mask calls, clicks, and environmental cues for Southern Residents, and can cause behavioural changes.¹²⁹ As a result, even under existing conditions, noise causes a reduction in foraging time that the Southern Residents cannot afford.¹³⁰ The passage of a large container ship can reduce echolocation from 400 metres in quiet conditions to only 60 metres, and, current noise levels cause Southern Residents to lose up to 97 per cent of their communication space during busy ship traffic conditions.¹³¹
103. Project Related Shipping would add noise to an already-too-noisy environment, with corresponding effects on the Southern Residents. It would reduce echolocation space over much of critical habitat.¹³² It would increase lost foraging time “for a species that has already lost too much foraging time.”¹³³ Even if, as the Proponent claims in a 2018 document, the number of container ship calls at Roberts Bank might not increase with the Project, the status quo is already too much noise; furthermore, if the source levels of noise increase as ship size increases, the result is still an increase in noise.¹³⁴ DFO has stated that the source level of noise from a vessel increases with the size of the vessel, meaning that if vessel sizes continue to increase, as the Proponent describes, the underwater noise from the vessels will correspondingly increase.¹³⁵

¹²⁶ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 13.

¹²⁷ *Veirs Report*, CCR, Volume 2, Appendix A, PDF pp 16-19.

¹²⁸ *Veirs Report*, CCR, Volume 2, Appendix A, PDF pp 17-18.

¹²⁹ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 21.

¹³⁰ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 21.

¹³¹ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 21.

¹³² *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 24.

¹³³ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 23.

¹³⁴ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 24.

¹³⁵ Document #959, “From Fisheries and Oceans Canada to the Review Panel re: Response to Information Requests issued by the Review Panel on April 5, 2017” (26 April 2017), [here](#), PDF pp 5-6.

104. DFO notes that the Southern Residents spend more time in certain parts of critical habitat, and that this includes the Project site. DFO is critical of the Proponent's failure to estimate the areas that will be permanently or temporarily degraded by acoustic disturbance during Project construction and operation.¹³⁶
105. The Proponent used a dose-response model to predict behavioural disturbance resulting from the Project, and estimated that Southern Residents would lose approximately 540.17 plus 30.90 hours per year of foraging time in the LAA due to behavioural disturbance and acoustic masking.¹³⁷ The Proponent then used a population consequences of disturbance ("PCOD") model to predict "the potential effects of any loss of foraging opportunities on an individual's vital rates" and determined that "the effects of acoustic disturbance on population growth rate are likely to be very small compared to existing conditions."¹³⁸
106. DFO has indicated that the Proponents' approach of categorizing responses by "severity" has "significant limitations" and fails to account for the Southern Residents being endangered; DFO states that a "context specific analysis [...] would be expected to provide a more accurate and appropriate representation of the potential impacts."¹³⁹ For example, a "low" severity response by a whale that was actively pursuing prey at the time, and resulting loss of prey, could have a substantial impact on the whale, representing "significant energy expenditure without a compensatory energy gain."¹⁴⁰ For the Southern Residents, the cumulative effect of "a small number of low severity disruptions" could be more harmful to an individual than a "single high severity response."¹⁴¹ This is important in the context of an endangered population where harm to an individual whale may have population-level effects.¹⁴²
107. DFO states that, in nearshore areas of critical habitat in summer and fall, Southern Residents spend approximately 40-67 per cent of their time foraging, and that "[i]n a

¹³⁶ Document #1289, *DFO Comments on Sufficiency*, [here](#), PDF p 24.

¹³⁷ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 246-249, 273.

¹³⁸ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 251.

¹³⁹ Document # 988, "From Fisheries and Oceans Canada to the Review Panel re: Response to Information Requests issued by the Review Panel on May 18, 2017" (29 June 2017) [here](#) [*DFO IR 4-14*], PDF pp 16-17.

¹⁴⁰ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 16-17.

¹⁴¹ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 16-17.

¹⁴² Document# 988, *DFO IR 4-14*, [here](#), PDF pp 16-17.

nutritionally stressed population such as the [Southern Residents], additional loss of foraging opportunity or decreases in foraging success are detrimental to survival and recovery; this is not adequately captured by using a non-contextual application of a behavioural assessment of impacts.”¹⁴³

108. DFO states that the severity ranking “does not adequately capture the disruption or displacement of a behavior that is in support of a critical life process”, and that repeated minor responses during foraging could “shift an animal into a negative energetic balance.”¹⁴⁴ DFO further states that the use of severity rankings and a dose-response paradigm may lead to erroneous conclusions about behavioural impacts.¹⁴⁵ DFO further clarifies that “[t]he lack of contextual analysis would lead to the conclusion that low to moderate severity responses would not be likely to interfere with vital rates.”¹⁴⁶
109. DFO warns that the population consequence of disturbance model used by the Proponent “involves numerous compounding assumptions and limitations such that any results have a high level of uncertainty and low confidence, and must be interpreted cautiously.”¹⁴⁷ DFO outlines the limitations, assumptions and uncertainties in detail.¹⁴⁸ DFO notes that the model predicts that behavioural disturbance responses and acoustic masking are having no effect on Southern Resident survival or reproductive rates and that the Proponent has conceded that there is “considerable uncertainty around these predictions” and that current levels of underwater noise may already be reducing the Southern Residents’ ability to forage, which may be limiting their ability to recover.¹⁴⁹
110. The Veirs Report identifies additional questions and concerns about the Proponent’s population consequences of disturbance model.¹⁵⁰

¹⁴³ Document #1289, “From Fisheries and Oceans Canada to the Review Panel re: Comments on the Sufficiency of Information” (1 October 2018) [*DFO Comments on Sufficiency*] [here](#), PDF p 23.

¹⁴⁴ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 18-19.

¹⁴⁵ Document# 988, *DFO IR 4-14*, [here](#), PDF p 20.

¹⁴⁶ Document #1289, *DFO Comments on Sufficiency*, [here](#), PDF p 23.

¹⁴⁷ Document #919, *DFO Technical Review*, [here](#), PDF pp 10, 24.

¹⁴⁸ Document #919, *DFO Technical Review*, [here](#), PDF pp 15-16.

¹⁴⁹ Document #919, *DFO Technical Review*, [here](#), PDF p 12.

¹⁵⁰ *Veirs Report*, CCR, Volume 2, Appendix A, PDF pp 38-39.

111. The Proponent concludes, in the context of its cumulative effects analysis, that the additional effects of Project Related Shipping “did not result in harm to an individual SRKW or behavioural effects or acoustic masking that are likely to affect features of SRKW critical habitat or SRKW life functions.”¹⁵¹ This is inconsistent with the evidence. The Conservation Coalition further notes that this appears to be an indirect argument that the Project will not violate the s. 32 or 58(1) prohibitions in SARA; the Conservation Coalition disagrees with this legal position.
112. DFO has warned that the Proponent’s further conclusion that the addition of the Project to cumulative effects will not result in increased mortality, decreased fecundity, or critical habitat destruction “should be viewed with caution.”¹⁵² DFO notes that additional disturbance “may reduce foraging efficiency below a threshold at which it is no longer energetically profitable to forage in the habitat, particularly in years with low prey availability”, and that “[t]his could potentially lead to displacement from or abandonment of critical habitat, as well as reduced survival and compromised recovery.” DFO states that recognizing this possibility is precautionary.¹⁵³
113. The effects of acoustic and physical disturbance also exacerbate the other threats to the Southern Residents.
114. As discussed below, there are no measures proposed to mitigate these impacts.

(b) Prey availability

115. Inadequate availability of the Southern Residents’ primary prey, Chinook salmon, is one of the three major threats to the Southern Residents and their critical habitat.¹⁵⁴ Availability of Chinook is a key attribute of critical habitat.¹⁵⁵
116. As explained in the Scott Report, summarized below, Southern Residents’ primary prey, Chinook salmon, are declining and are additionally threatened by the Project.
117. Chinook are not only declining in abundance. Their decline is also reflected in there being fewer, smaller fish with truncated run timings and reduced diversity of populations

¹⁵¹ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 275.

¹⁵² Document #919, *DFO Technical Review*, [here](#), PDF p 16.

¹⁵³ Document #919, *DFO Technical Review*, [here](#), PDF pp 16-17.

¹⁵⁴ Document #1374, *2018 Recovery Strategy*, [here](#), PDF p 7, 28.

¹⁵⁵ Document #1374, *2018 Recovery Strategy*, [here](#), PDF p 65.

spatially and temporally. Many populations have smaller fish and females with fewer eggs. This all affects Chinook's ability to meet the nutritional and physiological needs of Southern Residents (for example due to lower caloric value) and reduces Southern Residents' foraging efficiency, their social ecology (sharing large fish), and their presence in historic parts of their habitat.¹⁵⁶

118. In 2018, COSEWIC assessed 13 Chinook populations to be declining, including 12 Fraser River populations. Eight are “endangered” (including all of the assessed Fraser River spring conservation units of Chinook), four are “threatened”, and one is of “special concern”, for the purposes of potential listing under SARA. Only one Fraser River conservation unit that COSEWIC assessed was not at risk.¹⁵⁷ Of the 15 conservation units whose status has been assessed under the Wild Salmon Policy, 11 are in the “red” zone.¹⁵⁸ Despite DFO's obligations under the Wild Salmon Policy and Canada's Sustainable Fishery Framework, it has not made recovery plans, and Chinook have not been managed in a precautionary manner.¹⁵⁹
119. Habitat loss is one factor contributing to Chinook's degraded status, making functioning habitat crucially important.¹⁶⁰ Southern Residents and their recovery rely indirectly on Fraser River estuary Chinook habitat, the boundaries of which change seasonally but which includes most of the southern Strait of Georgia on the marine side, and a saline wedge up to New Westminster. All 19 Chinook conservation units that spawn in the Fraser watershed rely on habitats within the estuary for rearing, feeding, migration, and protection from predators in their juvenile life stage, and for holding and migration in their adult life stages. The estuary's features and processes support millions of out-migrating juvenile Chinook salmon destined for Georgia Strait every spring from March through June.¹⁶¹

¹⁵⁶ Misty MacDuffee, Kate Logan, and Paul Paquet, “Oil Spills in the Critical Habitat of Southern Resident Killer Whales (*Orcinus orca*)” (2018) Submission for the National Energy Board Hearings reviewing the marine shipping component of the Trans Mountain Project [*MacDuffee Report*], CCR, Volume 2, Appendix O at PDF p 370.

¹⁵⁷ *Scott Report*, Appendix A, Attachment 2, COSEWIC Chinook Assessment.

¹⁵⁸ *Scott Report*, Appendix A, Attachment 1, CSAS Chinook Assessment.

¹⁵⁹ *MacDuffee Report*, CCR, Volume 2, Appendix O, PDF pp 369, 386.

¹⁶⁰ *MacDuffee Report*, CCR, Volume 2, Appendix O, PDF p 372.

¹⁶¹ *MacDuffee Report*, CCR, Volume 2, Appendix O, PDF p 373.

120. Currently, the collapse of early-timed Fraser Chinook is linked to the altered use of critical habitat, increased stress, higher mobilization of contaminants, and pregnancy failure in the Southern Residents, which are important factors in their decline. This illustrates that in the event of a spill impacting Chinook, Southern Residents would not only be impacted by any long-term population-level consequences for Chinook, but also by the immediate loss of Chinook abundance in any run timing group directly affected by the spill. This means that even if the effects of a spill on Chinook were temporary, the effects on the already nutritionally stressed Southern Residents could be significant.
121. Furthermore, vessel presence and noise can alter fish behavior and may make them less accessible to Southern Residents.¹⁶²
122. The Veirs Report notes Dr. Veirs' concern that Project effects on herring or on herring's eel grass spawning habitat, due to construction or ship traffic, could have ecosystem effects relevant to Southern Residents.¹⁶³ Dr. Veirs identifies emerging evidence that underwater noise can displace herring.¹⁶⁴

(c) Contaminants

123. Contamination by toxic substances, including through bunker or diesel fuel spills, is one of the three main threats to the Southern Residents.¹⁶⁵ The Southern Resident Recovery Strategy identifies both the direct and indirect effects of contaminants on Southern Resident community structure, as well as on individual whales and their behaviour.¹⁶⁶
124. Southern Residents are vulnerable to accumulating high concentrations of certain chemicals because they are long-lived animals that feed high in the food web. Exposure to a large enough dose of a contaminant, such as through a fuel or cargo spill, can result in death as whales can die from inhalation of petroleum vapors.¹⁶⁷ Sub-lethal exposure can result in reproductive impairment, endocrine disruption, organ damage, immunotoxicity

¹⁶² *Scott Report*, CCR, Volume 2, Appendix B, PDF p 95.

¹⁶³ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 37.

¹⁶⁴ *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 37.

¹⁶⁵ Document #1374, *2018 Recovery Strategy*, [here](#), p 18.

¹⁶⁶ Document #1374, *2018 Recovery Strategy*, [here](#), p 18.

¹⁶⁷ Document #1374, *2018 Recovery Strategy*, [here](#), p 35.

and vulnerability to disease.¹⁶⁸ Further, contaminants can be passed on from mother to baby which can further impair that offspring's chances of survival. Studies of environmental contaminants in resident-type killer whales have revealed that they are among the most contaminated mammals in the world.¹⁶⁹ The Southern Resident Recovery Strategy identifies several contaminants of concern for killer whales relevant to the Project including: anti-fouling pesticides used on vessels, Polychlorinated naphthalenes used in ship insulation, polycyclic aromatic hydrocarbons that are a by-product of fuel combustion; and industrial fire and flame retardants.¹⁷⁰

125. Biological contaminants or pathogens are also a threat to the Southern Residents whose immune system is compromised through chemical contaminants and may be increasingly vulnerable to biological pollutants.¹⁷¹
126. Chemical and biological contaminants can both be introduced into Southern Resident critical habitat via shipping. Both intentional and unintentional discharge of chemicals and biological waste in bilge, grey and black water are a source of pollution in all coastal areas, but particularly in high traffic zones.¹⁷² Contaminants from shipping can also be indirectly introduced into the killer whales via contaminated prey. Southern Residents ingest contaminants through their prey fatty Chinook salmon which feed at the upper trophic levels in the food web.¹⁷³ Thus contamination of Chinook salmon or their habitat through the operation of the terminal in the Fraser River estuary or through Project Related Shipping also poses a risk to Southern Residents.
127. The Conservation Coalition is concerned that the Proponent has failed to meaningfully grapple with the potential effects of contaminants on Southern Residents from Project Related Shipping other than through an accidental fuel spill. Contaminants of potential concern are not thoroughly considered to identify which may be at issue as a result of the Project. As Dr. Kennedy observes, the Marine Shipping Addendum, without explanation,

¹⁶⁸ Document #1374, *2018 Recovery Strategy*, [here](#), p 20.

¹⁶⁹ Document #1374, *2018 Recovery Strategy*, [here](#), p 18.

¹⁷⁰ Document #1374, *2018 Recovery Strategy*, [here](#), Table 1, p 20.

¹⁷¹ Document #1374, *2018 Recovery Strategy*, [here](#), p 21.

¹⁷² Document #1374, *2018 Recovery Strategy*, [here](#), p 23.

¹⁷³ Document #1374, *2018 Recovery Strategy*, [here](#), p 22.

fails to consider the risk of contaminants, other than a fuel spill, that may arise from shipping activities through intentional or accidental release of bilge, ballast, grey or black waters.¹⁷⁴ Further, the limited contaminant-related studies referred to by the Proponent do not appear to be related to contaminants of potential concern for this Project.¹⁷⁵ Although the Proponent was asked by the Review Panel to consider contaminants more broadly (IR5-37), this has not happened.¹⁷⁶ Dr. Kennedy cautions that these omissions call into question the Proponent’s suggestion that the potential effects of contaminants is negligible.¹⁷⁷

128. Further, the Conservation Coalition is concerned that the significance of impacts of an accidental fuel spill – which is recognized as a potential adverse effect by the proponent – is down-played and the possibility of mitigation through spill response and recovery over-sold.¹⁷⁸ This is inconsistent with the Southern Resident Recovery Strategy conclusion that effects of exposure to an oil spill could be “catastrophic” for the whales.¹⁷⁹ With respect to the risk of an accidental fuel spill, there is no spill response plan or other mitigation that is tailored to Southern Residents or any other SARA-listed marine mammals. This is inconsistent with the Southern Resident Recovery Strategy and Action Plan¹⁸⁰ which suggest the development of a species-specific spill response plan.

(d) Vessel strikes

129. The Proponent considers it “unlikely” that a toothed whale such as a Southern Resident would be struck.¹⁸¹ It deems this to be a “low magnitude” and “not significant” effect.¹⁸²
130. However, the updated 2018 Recovery Strategy for the Southern Residents identifies vessel strikes as an “emerging threat” to Southern Residents based on new DFO science.¹⁸³ DFO

¹⁷⁴ 2016 Kennedy Report, CCR, Volume 2, Appendix D, PDF p 178.

¹⁷⁵ 2016 Kennedy Report, CCR, Volume 2, Appendix D, PDF p 178.

¹⁷⁶ 2019 Kennedy Report, “marine mammal – contaminant uptake”, CCR, Volume 2, Appendix E, PDF pp 215-216.

¹⁷⁷ 2016 Kennedy Report, CCR, Volume 2, Appendix D, PDF pp 179-180.

¹⁷⁸ 2016 Kennedy Report, CCR, Volume 2, Appendix D, PDF pp 182-183, 187.

¹⁷⁹ Document #1374, 2018 Recovery Strategy, [here](#), p 35.

¹⁸⁰ Fisheries and Oceans Canada, “Action Plan for the Northern and Southern Resident Killer Whale” (*Orcinus orca*) in Canada” (2017), CCR, Volume 2, Appendix W, page 649.

¹⁸¹ See Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF pp 506, 547.

¹⁸² Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF pp 268-269.

¹⁸³ Document #1374, 2018 Recovery Strategy, [here](#), p 17.

states that the Proponent’s claim that Southern Residents are likely to be struck due to their agility is not supported in light of necropsy reports for two Southern Residents – L112 in 2014 and J34 in 2016 – which identified blunt force trauma, possibly caused by ship strikes, as the cause of death.¹⁸⁴

131. With respect to the Project, DFO states that, within the relevant area, “ship strike risk may be high in some areas due to the potentially high speed with which container ships travel.”¹⁸⁵
132. DFO cited the “low numbers of breeding” Southern Residents, with a breeding population currently at approximately 26 (as of October 2018), and only two males fathering more than half of the calves born since 1990; on that basis it concluded that “ship collision can be considered a risk to population viability.”¹⁸⁶
133. The Review Panel has already noted that the Proponent’s conclusion that there will be no residual effects from vessel strikes on marine mammals after mitigation is unsupported.¹⁸⁷
134. The Veirs Report identifies Dr. Veirs’ concern about “the possible increased cumulative risk of ship strike” on the Southern Residents, given the current precarious status of the population and the impact of even a single mortality.¹⁸⁸
135. Because the Proponent considered vessel strikes unlikely to have effects on Southern Residents, it failed to include vessel strikes in an analysis of cumulative effects on Southern Residents. It also failed to propose mitigation, as discussed further below.

(e) Fuel oil spills

136. Due to their small population size, and low numbers of breeding individuals, effects of a fuel oil spills on even an individual Southern Resident could have population-level consequences. Furthermore, due to their tendency to travel as a group, up to and including occasional “superpods” during which all individuals are present, a spill could affect

¹⁸⁴ Document #1289, *DFO Comments on Sufficiency*, [here](#), PDF p 29; *Veirs Report*, CCR, Volume 2, Appendix A, PDF p 37.

¹⁸⁵ Document #1289, *DFO Comments on Sufficiency*, [here](#), PDF p 29.

¹⁸⁶ Document #1289, *DFO Comments on Sufficiency*, [here](#), PDF p 30.

¹⁸⁷ See *Compilation Document #934*, “Response to Information Request Package 5”, [here](#), PDF p 547.

¹⁸⁸ *Veirs Report*, CCR, Volume 2, Appendix A, PDF pp 37-38.

multiple individuals at once. A spill could also affect prey availability. Given the Southern Residents' current status, as described above, even short-term impacts on prey availability could impact the population and its future viability if it results in a failure to reproduce or one of more mortalities. The Recovery Strategy describes an oil spill in critical habitat as "potentially catastrophic".¹⁸⁹

137. The Proponent has stated that a spill could be "high magnitude with potentially lethal effects affecting individuals and population viability", and characterized the effects of a spill of heavy fuel oil on Southern Residents as "significant". However, the Proponent considers a spill "unlikely" and fails to incorporate this potential effect into a cumulative effects analysis.¹⁹⁰

(f) Cumulative effects of the Project on Southern Residents

138. Lacy et al. 2017, in the above-mentioned population viability analysis, modelled a status quo scenario as well as scenarios in which new developments increase threats, informed by the threats posed by the Trans Mountain Expansion Project, and showed that threats such as those posed by the Trans Mountain Expansion Project would "push a fragile population into steady decline."¹⁹¹
139. While this Project would have different effects than the Trans Mountain Expansion Project, due, among other things, to the smaller number but higher speed of vessels, Lacy et al. 2017 still provides an informative example of how adding a new project to existing conditions would harm the Southern Residents' prospects for survival and recovery. Furthermore, the Trans Mountain Expansion Project is likely to be approved during the public hearing of this Project (the statutory deadline for the Governor in Council's decision being May 22, 2019), and the Proponent has considered it as a project that will contribute to cumulative effects. This means that the effects of this Project will be additional even to what is modelled in Lacy et al. 2017, making the outlook for the Southern Residents even worse.

¹⁸⁹ Document #1374, *2018 Recovery Strategy*, [here](#), p 35.

¹⁹⁰ Document #316, *Marine Shipping Addendum*, Sections 9-12, [here](#), PDF p 375.

¹⁹¹ *Lacy et al*, CCR, Volume 2, Appendix S, page 504.

140. The Proponent finds that the acoustic effects of Project Related Shipping may combine with other marine shipping in the LAA to result in a cumulative effect. The Proponent concludes that the position that “[d]ue to the determination of significant effects to SRKW from past projects and activities [...], in combination with future Project-shipping activities and other certain and foreseeable activities, this assessment concludes that [...] there is an overall significant residual cumulative effect”: the “[c]hange in acoustic environment resulting in behavioural and acoustic masking effects from shipping”.¹⁹² As noted above, the Proponent’s assessment of cumulative effects on the Southern Residents does not include vessel strikes or exposure to fuel spills, only acoustic impacts.
141. The Conservation Coalition submits that the Proponent has erred by looking at effects in isolation and as a result has underrepresented the Project’s effects on the Southern Residents. The Proponent has considered acoustic and physical disturbance separately from vessel strikes, and only considered cumulative effects of acoustic and physical disturbance on Southern Residents. A cumulative effects analysis should include all effects of the Project in combination of existing and future activities, in order to address the overall, cumulative, population-level effect on the species. DFO’s Imminent Threat Analysis shows that threats to the Southern Residents act synergistically, exacerbating each other.¹⁹³ For this reason, the population viability analysis for Southern Residents by Lacy et al. models the impact of all of the interacting threats.¹⁹⁴
142. Canadian Environmental Assessment Agency guidance on cumulative effects emphasizes that cumulative effects may be synergistic, “when the resultant combination is greater or different than the simple addition of the effects”, as opposed to merely additive.¹⁹⁵ Cumulative effects on the Southern Residents are synergistic. The Proponent has not addressed the synergistic nature of the cumulative effects.

¹⁹² Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 284.

¹⁹³ *Imminent Threat Assessment*, Volume 2, Appendix R, PDF p 477.

¹⁹⁴ *Lacy et al*, CCR, Volume 2, Appendix S.

¹⁹⁵ Canadian Environmental Assessment Agency, “Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012”, Interim Technical Guidance, Version 2 (March 2018), Appendix 2.0 of Guidance, online: <<https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-ceaa2012.html>>, CCR, Volume 2, Appendix T, PDF pp 592-593.

143. The Conservation Coalition further submits that the Proponent misunderstands the concept of cumulative effects when it focuses on the Project’s contribution, throughout its materials. Despite conceding that the effect will be significant, the Proponent persists in claiming that “the contribution of Project-associated shipping to the cumulative effect is very small”.¹⁹⁶ This is not a relevant consideration. Cumulative effects are effects “likely to result from the designated project in combination with other physical activities that have been or will be carried out”.¹⁹⁷ The purpose of the environmental assessment is to consider not only the Project in isolation, which would be artificial and of limited usefulness, but to consider the state of the ecosystem and its components in a scenario in which the Project is combined with existing and foreseeable activities.
144. DFO has warned that the Proponent’s conclusion that the addition of the Project to cumulative effects will not result in increased mortality, decreased fecundity, or critical habitat destruction “should be viewed with caution.”¹⁹⁸
145. With respect to potential destruction of critical habitat, the Proponent defines critical habitat destruction as occurring “if part of the critical habitat is degraded, either permanently or temporarily, such that its biophysical features would not be available when needed by [Southern Residents] for foraging, mating, resting, or socializing.”¹⁹⁹
146. The Proponent appears to take the position that the Project’s cumulative effects will not result in destruction of critical habitat, stating that “the contribution of Project-associated shipping to the cumulative effect is very small and critical habitat will not be affected by the Project-associated shipping when needed by individuals for their life functions”.²⁰⁰ However, the Conservation Coalition submits, again, that it is the cumulative effects, and not only the Project’s relevant contribution, that is relevant to the integrity of critical habitat.

¹⁹⁶ See, for example, Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF pp 281-282.

¹⁹⁷ *CEAA 2012*, s 19(1)(a).

¹⁹⁸ Document #919, *DFO Technical Review*, [here](#), PDF p 16.

¹⁹⁹ Document #181, *EIS*, Volume 3, Sections 10.0 – 17.0, s 14.1.1.1, [here](#), PDF p 468. See also Document #919, *DFO Technical Review*, [here](#), PDF p 16.

²⁰⁰ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF pp 281-282.

147. DFO, applying the Proponent’s definition of destruction of critical habitat, states that “[t]he EIS demonstrates that under existing conditions, shipping noise is already causing a reduction in foraging opportunities for SRKWs in their critical habitat, and further reductions are anticipated under future operational conditions if the Project proceeds. This constitutes a temporary loss of function of SRKW critical habitat (diminished foraging due to reduced prey availability through acoustic disturbance and masking).”²⁰¹ DFO further states that whether or not Southern Residents are present at a given time is irrelevant to critical habitat degradation or destruction.²⁰² DFO does not reach a conclusion with respect to destruction but recommends that, since shipping noise is identified as an activity likely to destroy critical habitat in the Southern Residents Recovery Strategy, the Review Panel should examine whether “this temporary loss of function [...] would be considered destruction under the SARA.”²⁰³
148. The Conservation Coalition submits that, based on the Proponent’s own definition, DFO’s comments, and the evidentiary record at this time, the Project will result in loss of function of critical habitat that does constitute destruction of critical habitat. For example, as described above, the Veirs Report and the Proponent’s and DFO’s evidence shows that, at present, the acoustic quality of critical habitat is already severely compromised; the Project would exacerbate this situation, further contributing to degradation of critical habitat that amounts to destruction.

2. Effects on Humpback Whales and their critical habitat

(i) Humpback Whales

149. Humpback Whales were initially listed as threatened under SARA, and as of 2011 they are listed as a species of special concern. Their numbers have increased since whaling ended,

²⁰¹ Document #919, “From the Review Panel Secretariat to the Review Panel re: Fisheries and Oceans Canada’s Technical Review of the Roberts Bank Terminal 2 Environmental Impact Statement and Marine Shipping Supplemental Report: Effects on Marine Mammals” (24 January 2017) [*DFO Technical Review*], [here](#), PDF p 16.

²⁰² Document #1289, *DFO Comments on Sufficiency*, [here](#), PDF p 24.

²⁰³ Document #919, “From the Review Panel Secretariat to the Review Panel re: Fisheries and Oceans Canada’s Technical Review of the Roberts Bank Terminal 2 Environmental Impact Statement and Marine Shipping Supplemental Report: Effects on Marine Mammals” (24 January 2017) [*DFO Technical Review*], [here](#), PDF p 16.

but conservation concerns remain, including due to the possibility that there are genetically distinct regional feeding groups.²⁰⁴

150. Threats to Humpback Whales include vessel strikes, entanglement, toxic spills, prey reduction and acoustic disturbance.²⁰⁵

(ii) Humpback Whale critical habitat

151. Humpback Whale critical habitat has been identified off of southwest Vancouver Island.²⁰⁶ It overlaps with the RAA, and Humpback Whale critical habitat and other areas within their range would be affected by Project Related Shipping.²⁰⁷ Humpback Whales also occur throughout the RAA.
152. The RAA for Humpback Whales is smaller than the RAA for Southern Residents. Notably, it excludes the Strait of Juan de Fuca west of Victoria, and Swiftsure Bank, in the “Extended Area” west of the entrance to the Strait of Juan de Fuca.²⁰⁸ This is despite the fact that areas near the entrance to Juan de Fuca Strait and over Swiftsure Bank have high densities of Humpback Whales.²⁰⁹
153. Critical habitat includes not only this area but its attributes. Humpback Whales require adequate prey, a sufficiently quiet environment, physical space around them, and clean air and water.²¹⁰ Activities that could result in destruction of their critical habitat include intensive vessel traffic or increased vessel density, including vessels approaching them within 100-400 metres; toxic spills; and acoustic disturbance.²¹¹
154. Activities likely to degrade or destroy Humpback Whale critical habitat include vessel traffic, toxic spills, and pile driving, and work to identify more critical habitat and provide more information on its features is ongoing.²¹²

²⁰⁴ Document # 963 “From the Review Panel Secretariat to the Review Panel re: Recovery Strategy for the North Pacific Humpback Whale in Canada” (11 May 2017) [*Humpback Recovery Strategy*], [here](#), pp iv-v.

²⁰⁵ Document #963, *Humpback Recovery Strategy*, [here](#), pp iv-v.

²⁰⁶ Document #963, *Humpback Recovery Strategy*, [here](#), pp iv-v, 33-35.

²⁰⁷ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 283.

²⁰⁸ Document #919, *DFO Technical Review*, [here](#), PDF pp 5-6.

²⁰⁹ Document #919, *DFO Technical Review*, [here](#), PDF p 18.

²¹⁰ Document #963, *Humpback Recovery Strategy*, part 2.7 [here](#), pp 31-38.

²¹¹ Document #963, *Humpback Recovery Strategy*, part 2.8 [here](#), pp 39-42.

²¹² Document #963, *Humpback Recovery Strategy*, [here](#), Table 5, p 41.

(iii) Threats to Humpback Whales and Humpback Whale critical habitat

(a) Acoustic and physical disturbance

155. The Recovery Strategy for Humpbacks Whales lists acoustic disturbance as a potential threat to Humpback Whales and as a threat to critical habitat.²¹³
156. The Proponent notes that Humpback Whales and other baleen whales are more sensitive than toothed whales to low-to-medium frequencies such as those of commercial shipping vessels, but states that acoustic masking will not affect their ability to forage.²¹⁴
157. DFO found that the Proponent’s conclusion that acoustic masking would not affect Humpback Whales’ ability to forage was “not supported” by the evidence, “[g]iven the evidence that sound may be important to foraging Humpback Whales [...] and that Humpback Whales show considerable site fidelity to specific feeding grounds”.²¹⁵

(b) Vessel strikes

158. The Recovery Strategy for Humpback Whales lists vessel strikes as a threat to Humpback Whales.²¹⁶ The Proponent states that Humpback Whales and Fin Whales are the most likely species to be struck off the west coast of B.C.²¹⁷ DFO confirmed in November 2018 that a female humpback found deceased near the Tsawwassen ferry terminal in Delta, which is adjacent to the Project site, had injuries “consistent with catastrophic ship strike with propeller injuries.”²¹⁸
159. DFO has stated that the Stantec 2015 study the Proponent cited with respect to strike risk is not an appropriate source of information, given that it uses out of date Humpback Whale density data, and given that it deals with tankers, which are “considerably” slower than container ships, at approximately 12 knots as opposed to 20 knots or more; higher speeds make collisions more likely, and more likely to result in a mortality.²¹⁹ DFO further

²¹³ Document #963, *Humpback Recovery Strategy*, [here](#), PDF p 25, 31-33.

²¹⁴ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 252.

²¹⁵ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 9-10.

²¹⁶ Document #963, *Humpback Recovery Strategy*, [here](#), pp 14-17.

²¹⁷ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 257.

²¹⁸ Fisheries and Oceans Canada, “Necropsy results: Humpback whale and killer whale calf” (28 November 2018), online: <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/mammals-mammiferes/necrop-nov-18-eng.html?fbclid=IwAR0pGBevvM44Ch3R3b-AEgoj6bHpGmHKIBGncURfa2j6M_ACHdejVRJGwok>. See CCR, Volume 2, Appendix P, PDF 425.

²¹⁹ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 22.

explains that a 2016 study by Nichol et al. identified areas with a high probability of vessel-Humpback Whale interaction in the Project-related shipping area, with high or increasing Humpback density.²²⁰

160. As noted above with respect to the Southern Residents, the Proponent acknowledges that the risk of a strike, and of a strike being lethal, increases with vessel speed. The Proponent states generally that vessels travelling at more than 14 knots pose the greatest threat of a collision with a cetacean, and the probability of a lethal injury is 79 per cent at 15 knots, but decreases to 31% at 10 knots and 21% with a speed of 8.6 knots.²²¹
161. A 2017 DFO report on the risk of vessel strikes to Humpback and Fin Whales found that strikes by ships travelling at 12 knots are “likely to cause mortality”, and that strikes from ships travelling at 18 or more knots are “almost certain to be fatal”.²²² That paper also includes a map identifying areas of higher risk for a vessel strike, showing the highest relative probability in areas in and immediately outside the Juan de Fuca Strait, which would be used by Project Related Shipping.²²³
162. As noted above, vessels associated with the Project are expected to travel on average at 20 knots.²²⁴ The Proponent claims that “container ships will likely travel slower than present day container ships [...], thus reducing strike risk” but it does not specify a speed and it provides no support for this claim.²²⁵
163. The Proponent nevertheless states that the additional vessel movements from Project Related Shipping are “not predicted to result in population-level effects” on Humpback Whales.²²⁶ It deems the Project’s effects on Humpback Whales with respect to vessel strikes “not significant”.²²⁷

²²⁰ Document #919, *DFO Technical Review*, [here](#), PDF p 18.

²²¹ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 254.

²²² Document #1102, “From Fisheries and Oceans Canada to the Review Panel re: responses to Information Requests issued by the Review Panel on September 27, 2017” (14 November 2017) [*DFO Responses to September 2017 IRs*] [here](#), PDF p 39.

²²³ Document #1102, *DFO Responses to September 2017 IRs*, [here](#).

²²⁴ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 255.

²²⁵ Document #975, “VFPA, Information Request Package 5 from the Review Panel: Responses”, [here](#), PDF p 509.

²²⁶ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 258.

²²⁷ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 269.

164. The Review Panel has already noted that the Proponent’s conclusion that there will be no residual effects from vessel strikes on marine mammals after mitigation is unsupported.²²⁸
165. DFO stated that the magnitude for this effects should be rated as “high”, not “moderate”, “due to the high likelihood of lethal strikes from project related vessels, due to their speed.”²²⁹ DFO stated that, although it is unlikely that vessel strikes from Project Related Shipping alone would affect population viability, there is insufficient information to conclude that there would not be a population effect from vessel strikes, particularly given the potential for mortalities to contribute to cumulative effects.²³⁰
166. DFO further stated that mortalities from Project Related Shipping, along with mortalities from strikes by other vessels and other threats to Humpback Whales, may contribute to cumulative effects on this species.²³¹ DFO recommended that “ship collision risk should be mitigated as a precaution” due to “the uncertainty regarding the breeding stock of individual Humpback Whales occurring in the RAA.”²³²

(c) Cumulative effects

167. The Proponent considered two separate cumulative effects of the Project in combination with existing and foreseeable activities.²³³ The Proponent concluded that neither the residual cumulative effects on Humpback Whales from the “[c]hange in acoustic environment resulting in behavioural effects from shipping” nor the residual cumulative effects from “[p]hysical disturbance from vessel strikes from marine shipping” are significant.²³⁴
168. First, the Proponent claims that underwater noise from Project Related Shipping, including the cumulative effects of the Project in combination with existing and foreseeable activities, will not have significant adverse effects on Humpback Whales. With respect to the magnitude of the effect, the Proponent cites the species’ “relatively low use of the

²²⁸ Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 547. IR 5 is found for reference [here](#).

²²⁹ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 22-23.

²³⁰ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 22-23.

²³¹ Document# 988, *DFO IR 4-14*, [here](#), PDF p 23.

²³² Document #1289, *DFO Comments on Sufficiency*, [here](#), PDF p 29.

²³³ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF pp 282-283.

²³⁴ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 284.

LAA”, recent increases in the population, and the fact that “the contribution of Project-associated shipping to the cumulative effect is very small”.²³⁵ The Conservation Coalition submits that the Project’s relative contribution is not a relevant consideration when determining the significance of cumulative effects.

169. The Proponent further states that “critical habitat will not be affected by Project-associated shipping when needed for their life functions”, suggesting that the Proponent’s opinion is that critical habitat will not be destroyed by the Project.²³⁶ However, the Conservation Coalition submits that cumulative effects, not only the Project’s relevant contribution, are relevant in determining whether critical habitat is destroyed.
170. The Conservation Coalition submits that, for the purposes of determining significance, the duration of this effect should be rated as permanent, not long-term, given that the Project is expected to operate indefinitely.
171. Second, the Proponent claims that the cumulative effects of vessel strikes would not be significant.²³⁷ Despite the possibility for mortalities, the magnitude is rated as “moderate” on the basis that population-level effects are not expected, and effects are considered not significant, based on the supposedly low use of the LAA by Humpback Whales, as well as increases in the population.²³⁸ As noted above, DFO stated that the magnitude for this effect should be rated as “high”, and DFO further stated that there is insufficient information to conclude that there would not be a population effect from vessel strikes, particularly in the context of mortalities contributing to cumulative effects.²³⁹ As such, it is not precautionary to assume the effect would not be significant.
172. As stated above, DFO stated that mortalities from Project Related Shipping, along with mortalities from strikes by other vessels and other threats to Humpbacks Whales, may contribute to cumulative effects on this species.²⁴⁰ As stated above, cumulative effects

²³⁵ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 282.

²³⁶ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 282.

²³⁷ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 283.

²³⁸ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 283.

²³⁹ Document# 988, *DFO IR 4-14*, [here](#), PDF pp 22-23.

²⁴⁰ Document# 988, *DFO IR 4-14*, [here](#), PDF p 23.

should be considered together and in light of the potential for synergistic effects, not separately.

173. For all species, the Proponent considered acoustic and physical disturbance and vessel strikes separately, even with respect to the cumulative effects analysis, and therefore failed to consider the cumulative effects of acoustic and physical disturbance and vessel strikes from the Project in combination with existing and future activities. Unlike in its analysis of effects on Southern Residents, the Proponent acknowledged that the effects on a Humpback Whale from a vessel strike from Project Related Shipping “could interact cumulatively with other potential effects of past and future projects and activities, including increased risk of strikes, behavioural disturbance from underwater noise, entanglement, toxic spills, and prey reduction”; this could result “in a potential cumulative effect”.²⁴¹ The Proponent provided no analysis of how these two effects could interact and the resulting cumulative effects.
174. The Proponent stated that “potential future cumulative effects are poorly understood” and assumes that cumulative effects of marine shipping “will likely not jeopardise the survival or recovery” of Humpback Whales.²⁴²

3. Evidence concerning effects on other SARA-listed species

175. The Conservation Coalition have focused their evidence and submissions on the Southern Residents, because they are critically endangered, and to a lesser extent on Humpback Whales, due to the organizations’ limited resources and time. In this section they briefly address other SARA-listed species.
176. The Proponent has not done individual assessments for SARA-listed species other than the three indicator species (Southern Residents, Humpback Whales, and Steller Sea Lion.) It nevertheless purports to conclude, without any preceding analysis, that effects on them will not be significant.²⁴³

²⁴¹ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF pp 271-272, 277.

²⁴² Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 277.

²⁴³ See for example the conclusion that there will not be significant effects on other toothed whales: Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 282.

177. The Review Panel has identified nine SARA-listed marine species as likely to be affected by the Project, and in particular by Project Related Shipping: the Southern Residents, Humpback Whales, Green Sturgeon, Transient Killer Whale, Grey Whale Eastern North Pacific Population, Steller Sea Lion, Harbour Porpoise, Northern Abalone, and Olympia Oyster.²⁴⁴ Marine shipping can affect marine species in several ways, including through acoustic and physical disturbance, vessel strikes, and polluting the ocean and the air.
178. The Conservation Coalition notes that, in contrast, the National Energy Board panel reviewing the Trans Mountain Expansion Project, including associated marine shipping which would start in Burrard Inlet but then take place in the same shipping lanes as this Project's Project Related Shipping, identified 32 SARA-listed marine species that were likely to be affected by that project.²⁴⁵ This suggests that the Review Panel's list of nine species is under-inclusive for the purposes of s. 79(1) of SARA, and that as a result this hearing will fail to address effects on all relevant SARA-listed species.
179. For example, the Review Panel excluded Fin Whales and Leatherback Turtles from its SARA s. 79(1) list. DFO has stated on the record for this hearing that Fin Whales have been reported in the Juan de Fuca Strait,²⁴⁶ and a DFO 2017 paper cited above identifies a risk of ship strikes in that area for Fin Whales.²⁴⁷ The probability of a Fin Whale strike is higher than for Humpback Whales, and may have a greater impact due to that population being smaller and present year-round.²⁴⁸ DFO has also indicated that there may be effects on endangered Leatherback Turtles, which occur in the marine shipping area and have the potential to be struck by vessels.²⁴⁹

²⁴⁴ Document #51, *SARA Project Notification*, [here](#).

²⁴⁵ National Energy Board, "Letter to Fisheries and Ocean and Environment Canada: Trans Mountain Expansion Project – Potential effects on species listed under the Species at Risk Act" (23 April 2014), online: <https://apps.neb-one.gc.ca/REGDOCS/Item/View/2451215>>, CCR, Volume 2, Appendix U, PDF pp 607-616.

²⁴⁶ Document# 988, *DFO IR 4-14*, [here](#), PDF p 4.

²⁴⁷ Document #1102, *DFO Responses to September 2017 IRs*, [here](#), PDF p 39.

²⁴⁸ Document #1102, *DFO Responses to September 2017 IRs*, [here](#), PDF p 39.

²⁴⁹ Document #1057, "From Fisheries and Oceans Canada to the Review Panel re: Response to Information Requests issued by the Review Panel on July 17, 2017" (15 September 2017) [here](#), PDF pp 2-4.

180. The SARA s. 79(2) requirement for measures to avoid or lessen adverse effects applies to each one of these species. However, the Proponent has failed to address effects on each species or mitigation measures for those effects in its materials.
181. For example, acoustic and/or physical disturbance is noted as a concern in recovery documents for species including Killer Whale – Offshore, Pacific Harbour Porpoise, Blue Whale, Fin Whale, Sei Whale, Grey Whale Eastern North Pacific Population, Sea Otter, Transient Killer Whale and North Pacific Right Whale; vessel strikes are noted as a concern in recovery documents for Blue Whale, Fin Whale, Sei Whale, Leatherback Sea Turtle, Killer Whale – Transient, and North Pacific Right Whale.²⁵⁰ Of these species, only Harbour Porpoise, Grey Whale, and Killer Whale – Transient are identified in the SARA s. 79(1) list, and even for these species, the Proponent fails to address effects and mitigation.
182. These are important omissions, given that impacts on at-risk species can jeopardize recovery. For example, the recovery strategy for Offshore Killer Whales specifically notes that “anything beyond natural mortality could jeopardize the recovery” of the species.²⁵¹
183. The Action Plan for Blue, Fin, Sei, and North Pacific Right Whales identifies the following recovery action: “Continue to review applications for projects that involve production of

²⁵⁰ Document #1374, *2018 Recovery Strategy*, [here](#), p v; Document #1354, “From Fisheries and Oceans Canada to the Review Panel re: Recovery Strategy for the Offshore Killer Whale (*Orcinus orca*) in Canada” (20 November 2018), [here](#), e.g PDF pp 6, 8, 10; Canada, Species at Risk Registry, “Management Plan for the Pacific Harbour Porpoise (*Phocoena phocoena*) in Canada” (December 2009), online: <https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/mp_harbour_porpoise_1209_e.pdf>, PDF pp 7, 18, 21-23; Document #965, “From the Review Panel Secretariat to the Review Panel re: Recovery Strategy for Blue, Fin and Sei Whales in Pacific Canadian Waters” (15 May 2017), [here](#), PDF p 31-34 [*Recovery Strategy for Blue, Fin and Sei Whales*]; Canada, Species at Risk Registry, “Management Plan for the Eastern Pacific Grey Whale (*Eschrichtius robustus*) in Canada” (2011), online: <https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/mp_eastern_pacific_grey_whale_0111_e.pdf>, PDF pp 28-30; Canada, Species at Risk Registry, “Management Plan for the Sea Otter (*Enhydra lutris*) in Canada” (December 2007), online: <https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/mp_loutre_mer_sea_otter_0114_e.pdf>, PDF p 17, 19, 29-30 [*Sea Otter Management Plan*]; Canada, Species at Risk Registry, “Recovery Strategy for the Transient Killer Whale (*Orcinus orca*) in Canada” (2007), online: <https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/rs_transient_killer_whale_1207_e.pdf>, PDF pp 20-22, 27-29 [*Recovery Strategy for Transient Killer Whale*]; Canada, Species at Risk Registry, “Recovery Strategy for the North Pacific Right Whale (*Eubalaena japonica*) in Pacific Canadian Waters” (2011), online: <https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/rs_bnprw_0811a_e.pdf>, PDF pp 25-27 [*Recovery Strategy for North Pacific Right Whale*]; Species at Risk Registry, “Recovery Strategy for Leatherback Turtles (*Demochelys coriacea*) in Pacific Canadian Waters” (2007), online: <https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/rs_Leatherback_turtle_Pacific_population_0207_e.pdf>, PDF p 24.

²⁵¹ Document #1354, *Recovery Strategy for Offshore Killer Whale*, [here](#), PDF p 8.

noise and provide activity-specific requirements for monitoring and mitigation”.²⁵² DFO notes a similar item for Leatherback Sea Turtles: to consider potential adverse effects in environmental assessments and identify specific mitigation.²⁵³ This should happen in this environmental assessment, but these species have been excluded.

4. Lack of mitigation for effects of Project Related Shipping on Southern Residents and other SARA-listed species

184. Under CEAA 2012, mitigation measures are measures that eliminate, reduce or control the adverse environmental effects of a designated project.²⁵⁴ As explained by the Federal Court, neither “vague hopes of future technology”²⁵⁵ nor “vague adaptive management schemes”²⁵⁶ reasonably constitute mitigation. Mitigation measures need to be specific, and it needs to be clear how those measures would actually eliminate, reduce or control the adverse effects.
185. Further, s. 79(2) of SARA requires the Review Panel to “ensure” that measures are in place. This means that if the Review Panel is ultimately unable to directly ensure mitigation through project conditions, it may only conditionally recommend the Project, subject to measures being taken by other federal authorities to mitigate adverse effects.
186. To qualify as “measures” under s. 79(2) of SARA, there needs to be some certainty that measures will actually be implemented. It would not be reasonable to rely on a non-binding stated intention to do or consider doing something to discharge the duty to ensure mitigation of adverse effects on SARA-listed species.

(i) Lack of mitigation for acoustic and physical disturbance from Project Related Shipping

²⁵² Canada, Species at Risk Registry, “Action Plan for Blue, Fin, Sei, and North Pacific Right Whales (*Balaenoptera musculus*, *B physalus*, *B borealis*, and *Eubalaena japonica*) in Canadian Pacific Waters” (2017), online: <https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Ap-BlueFinSeiNprWhales-v00-2017Feb20-Eng.pdf>, PDF p 16.

²⁵³ Canada, Species at Risk Registry, “Action Plan for the Leatherback Sea Turtle (*Demochelys coriacea*) in Canada (Pacific population)” (2017), online: <https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Ap-LeatherbackSt-v00-2017Sept-Eng.pdf>, PDF p 15.

²⁵⁴ CEAA 2012, s. 2 definition of “mitigation”.

²⁵⁵ *Pembina Institute for Appropriate Development v. Canada* 2008 FC 302 at para 25.

²⁵⁶ *Taseko* at paras 123-124.

187. The Proponent states that “no specific mitigation measures are proposed to reduce underwater noise from marine shipping associated with the Project that may result in residual behavioural and acoustic masking effects.”²⁵⁷
188. The Proponent states that “no technically or economically feasible mitigation measures were identified to reduce or eliminate” the effects of underwater noise from Project operations on marine mammals.²⁵⁸
189. The Proponent rejects potential operational measures such as speed reductions on the basis that ships slow down when they enter the small area of VFPA jurisdiction, and it states that measures related to design and maintenance of foreign vessels calling at the Port is “not under the care and control of the VFPA.”²⁵⁹ When the Proponent refers to VFPA jurisdiction it is referring to its navigational jurisdiction in Port waters, as portrayed in the Port Information Guide, which covers a very limited area.²⁶⁰
190. The Proponent instead identifies initiatives that are not mitigation, such as the Enhancing Cetacean Habitat and Observation Program (“ECHO”).²⁶¹ It states that ECHO and the federal government’s Oceans Protection Plan “may result in future measures”.²⁶² As noted above, the possibility of future measures does not constitute mitigation.
191. Finally, the Proponent claims, without any evidentiary foundation, that “tools and strategies to mitigate the potential effects of marine vessel activities are expected to be implemented by Transport Canada by 2021 to 2022.”²⁶³
192. DFO states that the federal government’s assessment of potential mitigation is ongoing, and that DFO cannot currently identify measures that could ensure no net gain, or achieve a net loss, in underwater noise in the Salish Sea.²⁶⁴ DFO states that “it seems that efforts to

²⁵⁷ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 259.

²⁵⁸ Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 545.

²⁵⁹ Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 542.

²⁶⁰ Compilation Document #934, “Response to Information Request Package 1”, [here](#), PDF pp 2-9.

²⁶¹ Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 543.

²⁶² Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 545.

²⁶³ Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 534. The Proponent cites CEAR Document #954, a Transport Canada overview of the Oceans Protection Program, which does not include information about mitigation being implemented by 2021-2022.

²⁶⁴ Document# 988, *DFO IR 4-14*, [here](#), PDF p 26.

mitigate any increase in noise in critical habitat are warranted”, and that “no net gain” in noise would be an “optimal result”, and it notes that the technical advisory group on Southern Residents discussed various potential measure to keep noise at or near existing levels, but concludes that “none of these are discussed or proposed in the EIS.”²⁶⁵

193. In general, the adverse effects of acoustic disturbance from shipping can be abated by reducing the number of vessels and by reducing the noise made by individual vessels. The Veirs Report examines potential mitigation measures.²⁶⁶ The more challenging question is how to achieve noise reductions in the context of the already busy Salish Sea, and in the absence of an existing regulatory scheme to address noise.

(ii) Lack of mitigation for Project Related Shipping

194. As noted above, the Proponent mentions in Section 14 of the EIS that vessel speed is correlated with the probability of vessel strikes; however, it does not identify any related measures to mitigate vessel strikes.²⁶⁷

195. The Proponent states that “[m]itigation measures are not proposed in the LAA to reduce the risk of vessel strikes to marine mammals from RBT2-associated container ships.”²⁶⁸ It states that it will distribute an “awareness pamphlet” to marine pilots.²⁶⁹ Other than “awareness pamphlets”, the Proponent states that it is “unaware of other potential technically and economically feasible measures that could be used within VFPA jurisdiction to mitigate the potential effects of vessel strikes on marine mammals”, and therefore it proposes no mitigation measures.²⁷⁰

5. Lack of follow-up program for Project Related Shipping

196. Subsection 2(1) of CEAA 2012 defines a follow-up program as “a program for (a) verifying the accuracy of the environmental assessment of a designated project; and (b) determining the effectiveness of any mitigation measures.

²⁶⁵ Document #919, *DFO Technical Review*, [here](#), PDF pp 23-24.

²⁶⁶ *Veirs Report*, CCR, Volume 2, Appendix A, pp 25-30.

²⁶⁷ Document #181, *EIS*, Volume 3, Section 14.1.1.1, [here](#), PDF pp 537, 546.

²⁶⁸ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 259; Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 547. IR 5 is found for reference [here](#).

²⁶⁹ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 259.

²⁷⁰ Compilation Document #934, “Response to Information Request Package 5”, [here](#), PDF p 550. IR 5 is found for reference [here](#).

197. Subsection 19(1)(e) requires the Review Panel’s environmental assessment to take into account “the requirements of the follow-up program in respect of the designated project”. Subsection 43(1)(d)(i) provides that the Review Panel’s report must set out its “rationale, conclusions and recommendations, including any mitigation measures and follow-up program”.
198. The Proponent has not suggested a follow-up program for marine mammals in the LAA. Instead, the Proponent states generally that it will “work with stakeholders, Aboriginal groups, regulators, and the ECHO Program to monitor the distribution and abundance of marine mammals within the LAA to identify, prevent, and adaptively manage potential effects of underwater noise and vessel strikes on marine mammals, if they occur.”²⁷¹
199. With respect to the accuracy of the environmental assessment, the Proponent states that “[b]ecause confidence in the residual effects prediction is moderate to high, no follow-up programs are suggested” specific to the effects of Project Related Shipping.²⁷² With respect to determining the effectiveness of mitigation, there is no relevant mitigation. The Proponent states that it “has not identified any [follow-up program] elements for marine shipping associated with the Project, as it is outside the care and control of the VFPA”, nor is there any follow-up program identified for prey availability impacts on Southern Residents.²⁷³

B. Effects of the Project on salmon and salmon habitat

200. The Fraser River is one of the world’s greatest salmon rivers.²⁷⁴ From the headwaters in the Rocky Mountains, hundreds of tributaries combine as the river moves across British Columbia towards the Pacific. As these streams combine, the nature of the river changes, creating the diversity of habitats which salmon have adapted to thrive in. Salmon have spread throughout the watershed, evolving over time with the unique local conditions in each stream, using their homing ability to migrate back to their natal stream as adults.²⁷⁵

1. The Fraser River Estuary is important salmon habitat particularly for Chinook

²⁷¹ Document #316, *Marine Shipping Addendum*, Sections 1-8, [here](#), PDF p 286.

²⁷² Document #316, *Marine Shipping Addendum*, Sections 9-12, [here](#), PDF p 490.

²⁷³ Compilation Document #934, “Response to Information Request Package 13”, [here](#), PDF pp 175, 185.

²⁷⁴ Document #181, *EIS*, Volume 3, [here](#), PDF p 5.

²⁷⁵ *Scott Report*, CCR Volume 2, Appendix B, PDF p 79.

201. The Fraser was once the world's most productive salmon basin, and still produces more salmon than any other river in British Columbia. On European arrival, the Fraser was the most productive salmon river in the world, boasting populations of Chinook, chum, coho, pink and sockeye that were counted in the millions and originated from more than 1070 spawning populations distributed through the main stem and tributaries.²⁷⁶ Despite intense harvest and development pressures, the Fraser continues to support runs of all five economically important salmon species, producing over 50% of Canada's wild Pacific salmon.
202. The Fraser River estuary is a critical part of this ecosystem. All of the salmon that spawn in the Fraser watershed use the Lower Fraser²⁷⁷ and estuary as a migration corridor. Many populations of salmon rely on the estuary for rearing, spawning and feeding.²⁷⁸ Despite the Lower Fraser watershed representing less than 5% of the total area of the entire Fraser basin, this area supports more than half of the Fraser River's chinook and chum, 65% of its coho, 80% of its pink and significant stocks of sockeye salmon.²⁷⁹
203. The lower river and delta below New Westminster empties directly into the southern Strait of Georgia creating a fresh-saline mixing zone that is the estuary of the Fraser River. The inner estuary consists of the North Arm, which splits further around Sea Island into the North and Middle Arms, and the Main Arm which splits around the Woodward Island marsh complex into the Main Arm and Canoe Pass. The outer estuary is made up of Sturgeon and Roberts Bank. These areas provide a variety of habitats including marsh, sand/mud flats, and eelgrass that differ in salinity, sediment type, and water depth, and in their ability to support salmon.²⁸⁰
204. All species of Fraser River salmon migrate through the estuary twice during their lifespan and many will reside for days to months during their downstream migrations. The most estuary dependent species are Chinook and chum salmon which migrate downstream in

²⁷⁶ *Scott Report*, CCR Volume 2, Appendix B, PDF p 79.

²⁷⁷ The Lower Fraser is defined as the section of river flowing west from Hope, past Mission, through Metro Vancouver, and into the estuary where it meets the ocean.

²⁷⁸ *Scott Report*, CCR Volume 2, Appendix B, PDF p 79.

²⁷⁹ *Scott Report*, CCR Volume 2, Appendix B, PDF p 79.

²⁸⁰ Document #181, *EIS*, Volume 3, [here](#), PDF p 5; *Scott Report*, CCR Volume 2, Appendix B, PDF p 79.

their first year of life. Chinook and chum fry are known to rear in estuaries from a few days up to a few months for some Chinook populations.²⁸¹

205. Fraser River Chinook salmon populations are all vulnerable to various degrees to changes in the estuary. The severity of the impact of habitat change in the estuary depends on population, conservation unit (“CU”) and life stage.²⁸² Chinook populations most vulnerable to changes in habitat in the estuary are “ocean-type” Chinook. Ocean-type Chinook migrate to salt water in their first year. They spend a critical time in the estuary growing before heading out to the open water. They are vulnerable due to their extensive use of the estuary habitats as juveniles prior to ocean entry.²⁸³ For ocean-type Chinook, time spent in the estuary is critical for growth. The ability for juvenile Chinook to grow quickly during this estuary residence period is incredibly important as size at ocean entry is thought to be a major determining factor in early marine survival.²⁸⁴
206. The Harrison River Chinook population is one of the largest runs in North America, often making up the majority of the Fraser Chinook returns.²⁸⁵ This population has a unique life history that makes them the most vulnerable to habitat changes in the estuary of all Fraser River Chinook CUs. Harrison River Chinook fry migrate immediately after emergence downstream to the Lower Fraser and estuary where they rear, feed and grow for up to six months before ocean entry.²⁸⁶
207. Stream-type Chinook spend one full year in fresh water before migrating to the ocean. Although less dependent on the estuary than ocean-type, stream-type Chinook are present in the estuary from April to June.²⁸⁷

2. Salmon habitat in the estuary is already seriously degraded

208. Much of the estuarine habitat in the Lower Fraser has been lost. Dike construction, to permit agriculture and other developments and to prevent flooding, is estimated to be

²⁸¹ *Scott Report*, CCR Volume 2, Appendix B, PDF p 79.

²⁸² *Scott Report*, CCR Volume 2, Appendix B, PDF p 80.

²⁸³ *Scott Report*, CCR Volume 2, Appendix B, PDF pp 80-81.

²⁸⁴ *Scott Report*, CCR Volume 2, Appendix B, PDF p 81.

²⁸⁵ *Scott Report*, CCR Volume 2, Appendix B, PDF p 80.

²⁸⁶ *Scott Report*, CCR Volume 2, Appendix B, PDF p 81.

²⁸⁷ *Scott Report*, CCR Volume 2, Appendix B, PDF p 81.

responsible for removing 70% of the estuary from use by fish, aquatic invertebrates and waterfowl.²⁸⁸ Numerous large barriers, including the existing causeway and terminals at Robert's Bank, interrupt the movement of fish and disconnect ecosystems.²⁸⁹ This is particularly significant for certain species of juvenile salmon, which must now swim around these structures, exposing themselves to deep, saltier waters during a vulnerable juvenile stage of ocean entry when they would otherwise remain in the safer, nearshore areas.²⁹⁰ Cumulatively, human actions have likely severely reduced the ability of the estuary to support juvenile salmon and other species.²⁹¹

209. Original construction of the Roberts Bank coal port container terminal removed significant amounts of habitat from the estuary, and coal dust is found in ever increasing concentrations in the surrounding mudflats. Expansion of the coal port in 1980 was described by Fisheries and Oceans scientist Dr. Levings (1985) as having “obliterated feeding areas, invertebrate communities, and possibly herring spawning areas from the local productions system”.²⁹²
210. No baseline studies were conducted prior to the initial construction of the causeway and terminal²⁹³ – thus it is difficult to fully assess how the structures affected fish habitat and migration of salmon. There has been limited study of the use of Roberts Bank by juvenile salmon and all of it post-construction of the causeway.²⁹⁴ It is likely that before the construction of the original causeway, juvenile salmon navigated along the marsh and eelgrass nearshore areas of Roberts Bank, and experienced a progressive gradient of salinity as they moved further out into the estuary.²⁹⁵ Studies done shortly after the causeway was built demonstrated high densities of juvenile salmon in tidal marsh channels

²⁸⁸ *Scott Report*, CCR Volume 2, Appendix B, PDF p 82.

²⁸⁹ *Scott Report*, CCR Volume 2, Appendix B, PDF p 82.

²⁹⁰ *Scott Report*, CCR Volume 2, Appendix B, PDF p 82.

²⁹¹ *Scott Report*, CCR Volume 2, Appendix B, PDF p 82.

²⁹² *Scott Report*, CCR Volume 2, Appendix B, PDF p 82.

²⁹³ *Scott Report*, CCR Volume 2, Appendix B, PDF p 81.

²⁹⁴ *Scott Report*, CCR Volume 2, Appendix B, PDF p 81.

²⁹⁵ *Scott Report*, CCR Volume 2, Appendix B, PDF pp 92-93.

of the estuary; however, recent studies conducted at Roberts Bank have captured relatively few juvenile salmon compared to the vast number emigrating from the river.²⁹⁶

211. Thus, while the causeway and terminal appear to have impacted juvenile Chinook migration, orientation and behavior, the magnitude of these impacts has been an unresolved question since the construction of the original terminal.²⁹⁷

3. Chinook populations are in decline

212. The Fraser River has 56 unique CUs of commercially managed salmon, including 16 in the lower Fraser. Over the past few decades Chinook, coho and steelhead have had consistently low returns in the Fraser. In 2016 DFO concluded that the majority of Fraser River Chinook CUs had declined over the previous 12 to 15 years.²⁹⁸ As described above, in 2018, 12 of the 16 populations of Fraser River Chinook were assessed as “at risk” by the Committee on the Status of Wildlife in Canada.²⁹⁹ Harrison River Chinook, which are the most reliant on the estuary, were assessed as “threatened”, as they have failed to reach their escapement target in six of the last seven spawning years.³⁰⁰

4. The potential impacts of the project on already compromised salmon habitat and struggling Chinook

213. The Conservation Coalition are concerned that the Project has the potential to result in significant adverse effects on juvenile salmon and their habitats as a result of terminal placement and activities associated with terminal operations.
214. The Scott Report concludes that the greatest potential impact of this Project is the cumulative impact of the existing terminal placement and the additional new terminal expansion on juvenile salmon migration pathways in the estuary.³⁰¹ As a result of the current footprint of the existing terminal, juvenile Chinook must move from the brackish eelgrass habitats on the north side of the causeway into deeper saline waters if they hope to move into the inter-causeway habitat. Juvenile salmon migrating southward from the

²⁹⁶ *Scott Report*, CCR Volume 2, Appendix B, PDF p 81.

²⁹⁷ *Scott Report*, CCR Volume 2, Appendix B, PDF pp 81, 92.

²⁹⁸ *Scott Report*, CCR Volume 2, Appendix B, Attachment 1, CSAS Chinook Assessment.

²⁹⁹ *Scott Report*, CCR Volume 2, Appendix B, Attachment 2, COSEWIC 2018.

³⁰⁰ *Scott Report*, CCR Volume 2, Appendix B, PDF p 84.

³⁰¹ *Scott Report*, CCR Volume 2, Appendix B, PDF p 84.

mouth of the Fraser River may be exposed to highly saline waters as a result of the migration interruption created by the terminal, with unknown effects on their physiology and survival. Expanding the footprint would further exacerbate this issue.³⁰²

215. The Project, combined with the existing causeway and terminal, will further reduce ecosystem connectivity in the estuary and further disrupt juvenile salmon migration pathways. Migration pathways for juvenile salmon are already highly altered by multiple structures including the current Deltaport causeway and terminal and BC Ferries causeway at Roberts Bank, as well as the Steveston North Jetty, Iona Jetty, North Arm Jetty and Iona Causeway on Sturgeon Bank and Sea Island.³⁰³
216. The Conservation Coalition is further concerned about the potential for light and noise from the terminal operations to impact juvenile salmon behaviour and increase predation. Small juvenile Chinook may avoid moving around the terminal due to both light and noise. This would push juvenile salmon into deeper more saline waters, causing stress and even physiological changes³⁰⁴ and increasing the risk of predation.³⁰⁵ Artificial lights at the terminal can also facilitate excessive predation by seals.³⁰⁶ Underwater noise from ships calling at the terminal has the potential to effect juvenile Chinook salmon use of the Roberts Bank ecosystem by causing behavioural changes including avoidance behavior.³⁰⁷
217. Finally, there is the possibility of changes to the Roberts Bank ecosystem that could affect prey availability for juvenile salmon.³⁰⁸ The Proponent's ecosystem model predicts that juvenile Chinook will see an increase in productivity of 16%. This is based on the model's prediction that there will be a large increase in the productivity of macrofauna as a result of abiotic changes associated with the Project. This conclusion does not account for the effect of the decline in productivity of Pacific Herring, the larvae of which are important prey for juvenile salmon.

³⁰² *Scott Report*, CCR Volume 2, Appendix B, PDF p 93.

³⁰³ *Scott Report*, CCR Volume 2, Appendix B, PDF p 98.

³⁰⁴ *Scott Report*, CCR Volume 2, Appendix B, PDF p 93.

³⁰⁵ *Scott Report*, CCR Volume 2, Appendix B, PDF p 94.

³⁰⁶ *Scott Report*, CCR Volume 2, Appendix B, PDF p 95.

³⁰⁷ *Scott Report*, CCR Volume 2, Appendix B, PDF p 94.

³⁰⁸ *Scott Report*, CCR Volume 2, Appendix B, PDF pp 84, 90.

218. From a cumulative effects perspective, the Project will further exacerbate existing problems in the estuary and will result in additional cumulative adverse effects to an ecosystem which already faces a high level of cumulative effects on salmon habitat. Temporally, the effects of terminal placement are ongoing, permanent and irreversible, the construction of the new terminal further disrupts the migration pathway of juvenile salmon currently impacted by the existing causeway and terminal. This effect could only be reversed by the decommissioning and removal of the causeway and terminal.³⁰⁹

i. Climate change will amplify the negative effects of habitat degradation

219. Climate change is already beginning to alter conditions in the Fraser River estuary, potentially placing further stressors on an ecosystem already suffering from an array of cumulative effects. Sea-level rise will likely lead to an increase in flood control structures and other infrastructure which contributes to coastal squeeze and the loss of coastal marsh habitats. Changes to the hydrology in the watershed are predicted to result in spring freshets which arrive earlier each year, altering salinities in the estuary during the juvenile Chinook residence period.³¹⁰

220. Despite being requested to assess long-term changes of the surrounding ecosystem, the Proponent failed to consider the impacts of climate change in its ecosystem models. Instead, the Proponent concluded that “in the absence of concrete predictions around changes in physical processes, for the purposes of this assessment, expected conditions are assumed to be the same as existing conditions.”³¹¹

5. Proponent’s conclusions that the Project’s potential effects on salmon and salmon habitat are not scientifically defensible

221. The Proponent suggests that any adverse effects of the Project effects on juvenile chum and Chinook will be negligible after mitigation. With respect to mitigation, the Proponent suggests that any impacts on habitat in the vicinity of the terminal can be offset through habitat restoration in other parts of the estuary.

222. The Conservation Coalition questions the Proponent’s conclusions. The Scott Report concludes that the information presented by the Proponent in the EIS and supplementary

³⁰⁹ Scott Report, CCR Volume 2, Appendix B, PDF p 84.

³¹⁰ Scott Report, CCR Volume 2, Appendix B, PDF pp 82-83.

³¹¹ Document #181, EIS, Volume 3, section 13.5, [here](#), PDF p 320-321.

information request responses is insufficient to justify the Proponent's conclusions that the Project will result in negligible adverse impacts to juvenile Chinook and chum. Further, the Scott Report concludes that the Proponent's analysis and conclusion suffer from four flaws: (1) insufficient baseline data collection to properly characterize juvenile salmon use of Roberts Bank; (2) flaws in the application of the Robert Bank ecosystem; (3) lack of quantitative analysis of potential impacts of migration disruption, lighting and noise; and (4) the lack of success in past habitat restoration activities.

i. Insufficient baseline data collection to properly characterize juvenile salmon use of Roberts Bank

223. The conclusions in the EIS are based on field studies carried out by the Proponent in 2012 and 2013. These surveys were flawed by their limited duration, lack of replication, lack of intensity, limited number of sites, and inefficient field methodology. As a result they are insufficient to accurately depict juvenile Chinook habitat preferences and abundance in the Roberts Bank ecosystem.³¹² The field study data represents a snapshot of juvenile salmon abundance versus an accurate representation of juvenile Chinook abundance at Roberts Bank across the spring outmigration period.³¹³ Juvenile Chinook salmon and chum salmon abundance in the Fraser estuary has been shown to change rapidly throughout the spring and summer outmigration season, therefore repeated sampling is necessary to create an accurate representation.³¹⁴ Further, many of the assumptions drawn from the baseline data are not supported by the literature. The Scott Report concludes that field study conclusions seems to be an artifact of the limited field sampling conducted by the Proponent.³¹⁵ The field studies also failed to make comparisons across years, including with historical data, which could generate more accurate estimates of abundance and detect any changes in juvenile Chinook use of Roberts Bank over time.³¹⁶

ii. Flaws in the application of the Robert Bank ecosystem productivity model

³¹² Scott Report, CCR Volume 2, Appendix B, PDF p 85

³¹³ Scott Report, CCR Volume 2, Appendix B, PDF p 86.

³¹⁴ Scott Report, CCR Volume 2, Appendix B, PDF p 86.

³¹⁵ Scott Report, CCR Volume 2, Appendix B, PDF p 86.

³¹⁶ Scott Report, CCR Volume 2, Appendix B, PDF p 87.

224. The ecosystem productivity model is inappropriate to accurately characterize the potential effects of the Project on juvenile Chinook, as it is unable to incorporate several factors which have the potential to cause adverse effects. The potential effects of the Project resulting from construction activities, noise, lighting and changes to migration pathways are only assessed qualitatively by the Proponent, despite their potential to impact juvenile Chinook.³¹⁷ Due to these significant uncertainties, the Scott Report concludes that the results of the ecosystem productivity model should not be used as a line of evidence when evaluating the potential adverse effects of the project on juvenile Chinook salmon.³¹⁸ The ecosystem productivity model is inappropriately used as a line of evidence to conclude lack of potential effects.³¹⁹
225. Further, the Proponent's flawed field studies were used in the ecosystem model. As stated above, the data generated by these studies is insufficient.
226. The ecosystem model is also inappropriate to predict effects on juvenile Chinook as it does not reflect the fact that they only spend a portion of the year in the assessment area. Juvenile Chinook peak in abundance at Roberts Bank in the spring and are completely absent from the area during the fall and winter, at least half of the year – which is not factored into the model.³²⁰ As a consequence, the model fails to consider whether potentially beneficial effects of the Project will occur at a time of year that useful for juvenile salmon.³²¹

iii. Lack of quantitative analysis of potential impacts of migration disruption, lighting and noise

227. There is little quantitative evidence to support the conclusion in the EIS that the effects of the Project on juvenile Chinook will be minor. Instead, this conclusion appears to be based on the ecosystem productivity model and a qualitative assessment of other effects of the Project on juvenile Chinook. It appears that in the absence of actual information, the effects of construction, acoustic disturbance, lighting and migration disruption are all

³¹⁷ Scott Report, CCR Volume 2, Appendix B, PDF p 89.

³¹⁸ Scott Report, CCR Volume 2, Appendix B, PDF p 89.

³¹⁹ Scott Report, CCR Volume 2, Appendix B, PDF p 89.

³²⁰ Scott Report, CCR Volume 2, Appendix B, PDF p 90.

³²¹ Scott Report, CCR Volume 2, Appendix B, PDF pp 89-90.

assumed by the Proponent to be minor.³²² The Proponent has failed to perform the necessary field studies to support the conclusion that the effects will be minor.³²³ Without quantitative evidence to analyze the potential effects there can be little confidence in the prediction that the adverse effects of the Project will be minor.

iv. Failure to consider lack of success in past habitat compensation activities

228. The Proponent plans to offset habitat losses with tidal marsh creation. In their response to IR7-28 Marine Fish – Mitigation, Habitat Compensation the Proponent provides two examples of past compensation projects – the BC Ferries project and the inter-causeway south marsh – to demonstrate their ability to successfully compensate for habitat loss. Both of those compensation projects failed as initially designed, and it took a very long time to actually accomplish any restoration.³²⁴ The Proponent has yet to provide evidence that they are able to successfully complete compensation projects in a timely way and meet their desired goals. The fact that habitat compensation in the context of this Project might be similarly challenging is not factored into the Proponent’s conclusions.

6. There are limited options to mitigate the Project’s impacts

229. According to the Scott Report, the options to mitigate the Project’s impacts are limited.

230. As discussed above, the track record of habitat restoration in the estuary – the Proponent’s preferred mitigation technique – is inconsistent at best. Also, the Scott Report questions whether the creation of habitat offsetting projects in other areas of the estuary, regardless of their success, could functionally compensate for the increased migration disruption at Roberts Bank. Further, as recognized by the Proponent, with habitat restoration comes the risk of significant time lags between the adverse effects of developing the Project and the restorative effects of habitat compensation.³²⁵ This is a factor which should be taken into consideration when assessing the ability of habitat restoration projects to mitigate the adverse effects of impacts to Chinook habitat. Even a temporary loss in productivity of Chinook habitat in the estuary could have a short term impact on Chinook abundance, and by extension an impact on Chinook dependent species such as the Southern Residents. As

³²² Scott Report, CCR Volume 2, Appendix B, PDF p 91.

³²³ Scott Report, CCR Volume 2, Appendix B, PDF p 92.

³²⁴ Scott Report, CCR Volume 2, Appendix B, PDF pp 95-98.

³²⁵ Scott Report, CCR Volume 2, Appendix B, PDF p 98.

noted above, due to the small and vulnerable nature of the Southern Resident population, even short-term prey availability issues can have population-level consequences.

231. The only mitigation option that might directly compensate for the impacts on salmon migration and habitat connectivity would involve creating openings in the causeway through the installation of a series of culverts or bridges to allow the movement of water and fish. Experimental openings are being tested on other barriers in the estuary³²⁶ and warrant consideration in the context of this Project as a way to address not only the proposed addition but the historical disruption of fish passage.

C. Greenhouse gas emissions are a significant adverse environmental effect

232. On December 12, 2015, Canada and 194 other countries reached the Paris Agreement. In signing the Paris Agreement, Canada committed to take action to keep warming below 2°C and to make efforts to keep it below 1.5°C. Canada ratified the agreement on October 5, 2016, following a vote in Parliament. The Paris Agreement entered into force on November 4, 2016.³²⁷
233. In October 2018, at the invitation of the parties to the Paris Agreement, the Intergovernmental Panel on Climate Change released a report entitled “Global Warming of 1.5°C: Summary for Policymakers” (the “IPCC Report”) – which explores the impacts of global warming of 1.5°C above pre-industrial levels.³²⁸ The IPCC Report also provides a comparison between the impacts of global warming of 1.5°C and 2°C.
234. The IPCC Report finds that if the goal of limiting global warming to 1.5°C is not achieved, it will have concrete consequences for human and animal life, as well as the time that will be available for humankind to adapt to climate change.
235. The IPCC Report provides new information about the severity of climate change impacts and the urgency of reducing anthropogenic GHG emissions. In particular, it highlights the differences in impacts on people, animals, and ecosystems if global warming is kept to an increase of 1.5°C above pre-industrial levels, rather than being allowed to rise to 2°C.

³²⁶ *Scott Report*, CCR Volume 2, Appendix B, PDF p 100.

³²⁷ Government of Canada, “The Paris Agreement”, online: <<https://www.canada.ca/en/environment-climate-change/services/climate-change/paris-agreement.html>>.

³²⁸ *IPCC Report*, CCR, Volume 2, Appendix Q, Introduction, PDF p 436.

236. The differences between the two scenarios are stark. By limiting warming to 1.5°C, impacts on human health, forest fires, the spread of invasive species, ocean acidity and decreases in ocean oxygen levels, risks to marine biodiversity, fisheries, ecosystems, and their functions and services to humans, are all lower than if warming is allowed to reach 2°C.
237. The IPCC Report makes several other important findings, including that:
- a) human activities are estimated to have already caused approximately 1.0°C of global warming above pre-industrial levels;³²⁹
 - b) impacts from current warming, including changes to many land and ocean ecosystems, have already been observed;³³⁰
 - c) warming from anthropogenic emissions from the pre-industrial period to now will already cause further long-term climate change, but finds that this warming alone will not cause a further increase reaching 1.5°C;³³¹
 - d) if global warming continues to increase at its current rate, warming is likely to reach 1.5°C between 2030 and 2052;³³² and
 - e) the extent of the increase toward and beyond that level is dependent on the speed with which humankind takes action, as this will affect the rate, peak, and duration of warming.³³³
238. The IPCC Report identifies pathways that would allow warming to stop at 1.5°C. This requires limiting the total cumulative global anthropogenic emissions. To follow the pathways limiting global warming to 1.5°C would require “rapid and far reaching transitions” and “deep emissions reductions” in all sectors including infrastructure, transport and industrial systems.³³⁴
239. International shipping is already a significant source of GHGs globally. Canada does not directly regulate marine GHGs and has no plan or policy to reduce the intensity of GHG

³²⁹ *IPCC Report, CCR, Volume 2, Appendix Q, section A.1, PDF p 436.*

³³⁰ *IPCC Report, CCR, Volume 2, Appendix Q, section A.3.1, PDF p 437.*

³³¹ *IPCC Report, CCR, Volume 2, Appendix Q, section A.2.1, PDF p 437.*

³³² *IPCC Report, CCR, Volume 2, Appendix Q, section A.1, PDF p 436.*

³³³ *IPCC Report, CCR, Volume 2, Appendix Q, section A.3.2-A.3.3, PDF p 437.*

³³⁴ *IPCC Report, CCR, Volume 2, Appendix Q, section C.2, PDF p 447.*

emissions. Further, these emissions are not covered by the UNFCCC agreement and thus stand out as an under addressed threat to global efforts to reduce GHGs. British Columbia's carbon price will not apply to these emissions, and federal carbon pricing does not apply in British Columbia because the province's pricing scheme meets benchmark criteria.

240. In its recent reconsideration of the proposed Trans Mountain Expansion Project, the National Energy Board assessed the direct greenhouse gas emissions generated from project-related marine shipping. The Board found that marine shipping is expected to result in a measurable percentage increase in marine GHGs, and that, as a result, the marine GHGs are likely to be significant.³³⁵ In reaching its conclusion on significance, the Board found that greenhouse gas emissions are a concern because of their long term accumulation in the atmosphere, and also because marine greenhouse gas emissions are not regulated by Canada.
241. The Conservation Coalition is concerned that, similarly, the increase in the number and/or size of vessels calling at the Project will result in a measurable increase of GHGs in this dangerously under regulated area. This would occur at a time when the global scientific consensus is that we must drastically reduce and not increase GHG emissions. The Review Panel must assess this environmental effect.

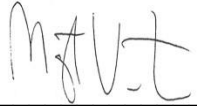
IV. Conclusion

242. It is clear based on the record so far that the Project is likely to cause significant adverse environmental effects. The Conservation Coalition will take a final position on these matters in their closing remarks, after the public hearings are completed and the evidentiary record is closed. However, based on the record thus far, they expect to argue in their closing remarks that the Project's significant adverse environmental effects cannot be effectively mitigated, nor are they justified in the circumstances, and that the Review Panel's final recommendations should reflect this.

All of which is respectfully submitted.

³³⁵ National Energy Board, Reconsideration Report, Trans Mountain Pipeline ULC, MH-052-2018 (February 2019), online: <<https://apps.neb-one.gc.ca/REGDOCS/Item/Filing/A98021>>, Appendix V, PDF pp 618-623.

April 15, 2019



Margot Venton



Dyna Tuytel

Representatives for David Suzuki Foundation, Georgia Strait Alliance, Raincoast Conservation Foundation and Wilderness Committee