

**JOINT REVIEW PANEL FOR THE ENBRIDGE
NORTHERN GATEWAY PROJECT
COMMISSION D'EXAMEN CONJOINT DU PROJET
ENBRIDGE NORTHERN GATEWAY**



**Hearing Order OH-4-2011
Ordonnance d'audience OH-4-2011**

**Northern Gateway Pipelines Inc.
Enbridge Northern Gateway Project
Application of 27 May 2010**

**Demande de Northern Gateway Pipelines Inc.
du 27 mai 2010 relative au projet
Enbridge Northern Gateway**

VOLUME 167

**Hearing held at
Audience tenue à**

**Chances Prince Rupert
240 West, 1st Avenue
Prince Rupert, British Columbia**

**April 22, 2013
Le 22 avril 2013**

**International Reporting Inc.
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Canada

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as represented by the Minister of the Environment
and the National Energy Board

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Imprimé au Canada

HEARING /AUDIENCE

OH-4-2011

IN THE MATTER OF an application filed by the Northern Gateway Pipelines Limited Partnership for a Certificate of Public Convenience and Necessity pursuant to section 52 of the *National Energy Board Act*, for authorization to construct and operate the Enbridge Northern Gateway Project.

HEARING LOCATION/LIEU DE L'AUDIENCE

Hearing held in Prince Rupert (British Columbia), Monday, April 22, 2013
Audience tenue à Prince Rupert (Colombie-Britannique), lundi, le 22 avril 2013

JOINT REVIEW PANEL/LA COMMISSION D'EXAMEN CONJOINT

S. Leggett	Chairperson/Présidente
K. Bateman	Member/Membre
H. Matthews	Member/Membre

APPEARANCES/COMPARUTIONS

(i)

APPLICANT/DEMANDEUR

Northern Gateway Pipelines Inc.

- Mr. Richard A. Neufeld, Q.C.
- Mr. Ken MacDonald
- Mr. Bernie Roth
- Ms. Laura Estep
- Ms. Kathleen Shannon
- Mr. Dennis Langen
- Mr. Douglas Crowther

INTERVENORS/INTERVENANTS

Alberta Federation of Labour

- Ms. Leanne Chahley

Alberta Lands Ltd.

- Mr. Darryl Carter

Alexander First Nation

- Ms. Caroline O'Driscoll

BC Nature and Nature Canada

- Mr. Chris Tollefson
- Mr. Anthony Ho
- Ms. Natasha Gooch

Doug Beckett

Province of British Columbia

- Ms. Elizabeth Graff
- Mr. Christopher R. Jones

Nathan Cullen

C.J. Peter Associates Engineering

- Mr. Chris Peter

Canadian Association of Petroleum Producers (CAPP)

- Mr. Keith Bergner
- Mr. Lewis L. Manning

Cenovus Energy Inc., Nexen Inc., Suncor Energy Marketing Inc.,
Total E&P Canada Ltd.

- Mr. Don Davies

Coastal First Nations

- Ms. Brenda Gaertner
- Ms. Maria Morellato
- Mr. Art Sterritt

APPEARANCES/COMPARUTIONS
(Continued/Suite)

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INTERVENORS/INTERVENANTS

Council of the Haida Nation

- Ms. G.L. Terri-Lynn Williams-Davidson
- Guujaaw

Daiya-Mattess Keyoh

- Mr. Kenny Sam
- Mr. Jim Munroe

Douglas Channel Watch

- Mr. Murray Minchin
- Ms. Cheryl Brown
- Mr. Kelly Marsh
- Mr. Manny Arruda
- Mr. Dave Shannon

Driftpile Cree Nation

- Mr. Aryn F. Lalji

Enoch Cree Nation, Ermineskin Cree Nation and Samson Cree Nation

- Mr. Allan Stonhouse
- Mr. Markel Chernenkoff
- Mr. G. Rangi Jeerakathil

ForestEthics Advocacy, Living Oceans Society
and Raincoast Conservation Foundation - "The Coalition"

- Mr. Barry Robinson
- Mr. Tim Leadem, Q.C.
- Ms. Sasha Russell
- Ms. Karen Campbell

Fort St. James, District of

- Mr. Kevin Crook

Fort St. James Sustainability Group

- Mr. Lawrence Shute
- Ms. Brenda Gouglas
- Ms. Kandace Kerr

Friends of Morice-Bulkley

- Ms. Dawn Remington
- Mr. Richard Overstall

Gitga'at First Nation

- Mr. Michael Ross
- Ms. Krystle Tan

APPEARANCES/COMPARUTIONS
(Continued/Suite)

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INTERVENORS/INTERVENANTS

Gitxaala Nation

- Ms. Rosanne M. Kyle
- Ms. Virginia Mathers
- Ms. Leslie Beckmann

Government of Alberta

- Mr. Evan W. Dixon
- Mr. Ron Kruhlak

Government of Canada

- Mr. James Shaw
- Ms. Dayna Anderson
- Mr. Kirk Lambrecht
- Mr. Brendan Friesen
- Ms. Sarah Bird

Haisla Nation

- Ms. Jennifer Griffith
- Ms. Hana Boye
- Mr. Jesse McCormick
- Mr. Allan Donovan
- Mr. Michael Gordon
- Ms. Gillian Bakker

Heiltsuk Tribal Council

- Ms. Carrie Humchitt
- Mr. Benjamin Ralston
- Ms. Lisa Fong

Kelly Izzard

Kitimat Valley Naturalists

- Mr. Walter Thorne
- Mr. Dennis Horwood
- Ms. April MacLeod
- Mr. Ken Maitland

MEG Energy Corp.

- Mr. Loyola Keough
- Mr. David A. McGillivray

Michel First Nation

- Acting Chief Gil Goerz
- Ms. Tracy Campbell

APPEARANCES/COMPARUTIONS
(Continued/Suite)

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INTERVENORS/INTERVENANTS

Northwest Institute of Bioregional Research

- Ms. Patricia Moss

Office of the Wet'suwet'en

- Mr. Mike Ridsdale

- Mr. David De Wit

- Chief Namoks (John Ridsdale)

Swan River First Nation

- Mr. Jay Nelson

- Ms. Dominique Nouvet

United Fishermen and Allied Workers' Union

- Ms. Joy Thorkelson

- Mr. Hugh Kerr

Terry Vulcano

Dr. Josette Wier

National Energy Board/Office national de l'énergie

- Mr. Andrew Hudson

- Ms. Carol Hales

- Ms. Rebecca Brown

- Mr. Asad Chaudhary

- Mr. Neil Patterson

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Description

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UNDERTAKINGS/ENGAGEMENTS

No.	Description	Paragraph No./No. de paragraphe
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Preliminary matters

--- Upon commencing at 8:00 a.m./L'audience débute à 8h00

15635. **THE CHAIRPERSON:** Good morning, everyone. Thank you for those of you in the room and for those of you joining us on the webcast to be here at this hearing session. Bonjour à tous.
15636. Are there any preliminary matters that parties wish to raise?
15637. **MR. LEADEM:** Just a preliminary matter, Madam Chair, for the record.
15638. Leadem, initial T, appearing as counsel for the Coalition. Late last week I received a call from Mr. Cullen's office. He was scheduled to precede me in the order of questioning and his office requested that we switch places.
15639. I understand from my conversations with his office that Mr. Cullen is a member of a Parliamentary committee which is actually sitting at this particular time. So I would be happy to accommodate Mr. Cullen and proceed before him.
15640. **THE CHAIRPERSON:** Thank you for advising us, Mr. Leadem.
15641. **MR. PATTERSON:** Madam Chairman, we have one other matter for preliminary matter. Coastal First Nation advised us last week that they will not be available during this panel. We don't have any further information beyond that, but they wanted it on the record.
15642. **THE CHAIRPERSON:** Thank you, Mr. Patterson.
15643. **MR. PATTERSON:** Thank you.
15644. **THE CHAIRPERSON:** Mr. Roth?
15645. **MR. ROTH:** Good morning, Madam Chair and Members of the Panel. It's mainly a timing issue.
15646. We provided estimates regarding how long we would be with the federal panels in cross, and the estimates were largely just guesses by way of what we would have to follow-up on for matters arising during the course of intervenor cross.

Preliminary matters

15647. However, in the Board's correspondence of April 18th, it made it clear that the Board would like to finish up no later than May the 4th with the hearing.
15648. We had in a series of correspondence going back noted the potential for rebuttal evidence and it's certainly our intention to try and avoid that if at all possible, and we don't have anything that is of necessity introduced by way of rebuttal now.
15649. There was the issue of the late admission of a report by Dr. Short, and what I am going to endeavour to do is stretch out my cross-examination a little bit of the federal government witness panels. It would mainly be -- the stretching out would mainly be for its second panel and try to address the matters of fate and effects that Dr. Short addressed in his report, sufficiently such that there would be no issue of need for rebuttal evidence.
15650. So things kind of lie in my hands to -- Mr. Neufeld told me I had to do a very good job of cross-examination so there would be no need for rebuttal evidence. So -- but in order to accomplish that, I told Mr. Neufeld I might need a little bit more time than he estimated with federal panels, but it wouldn't be a lot, like maybe, at most, an hour or two more, mainly on Panel 2.
15651. The second matter, and again, gets to timing and it has no immediate effect, Madam Chair, but your Procedural Direction 12 on argument regarding the amount of time Northern Gateway would have for oral reply to written argument, we are just a little bit concerned.
15652. Now, we haven't seen all of the arguments in-chief yet, but once May 31st comes around, we'll be better able to assess whether two hours is adequate time to go through everything by way of our oral reply.
15653. So nothing -- it's just a little bit of a heads up. On May 31st, we'll look what we have to make it through and you might get some correspondence from us in advance, in writing, if we believe that we would need more time than two hours to adequately reply.
15654. So those are my preliminary matters, Madam Chair.
15655. **THE CHAIRPERSON:** Thank you, Mr. Roth.
15656. **MS. ANDERSON:** Good morning, Madam Chair, Members of the

Preliminary matters

- Panel. My name is Dayna Anderson. I appear on behalf of the federal government participants. With me today is Brendan Friesen and Sarah Bird, both counsel with the department.
15657. So I just have a couple of preliminary matters to deal with, following which I'll have Mr. Brendan -- Mr. Friesen deal with the witness introductions.
15658. So first of all, just -- we wanted to state again as we did in Prince George, that out of respect for the Panel process, our witnesses will not be giving media interviews.
15659. We also wanted to point out that in the last week or so, we filed a number of updates to our witness package. We've done an updated witness panel responsibility chart and an updated witness list and we're hoping that that will help direct the questioners to the right panel and the right witnesses.
15660. We've also filed some affidavits for some witnesses adopting their CVs, just in an effort to try and speed up the witness introductions a little bit. For logistical reasons we couldn't get everyone's in, but -- so for those who don't have an affidavit, we'll still have to do a very short direct exam.
15661. And I just also wanted to confirm, as in one of our witness updates, that Witness Panel 1 is the appropriate panel to direct questions to with respect to environmental effects, whether they be spill related or otherwise. I think there may have been a little bit of confusion on that, so we just wanted to point that out for the questioners.
15662. And finally, I just have a couple of notes about witness availability. Mr. Thomas King who's here from Fisheries and Oceans is scheduled to be on Panels 1 and 2, and he is here today, but due to a previous commitment, he will have to be leaving on April 27th. So hopefully that won't be an issue and all the questions that he needs to answer will have been dealt with by then, but just wanted to alert the Panel.
15663. And we also wanted to alert you that we do have four witnesses from Environment Canada who are on call in the event of a pollution -- significant pollution incident. Those are Grant Hogg, Carl Brown, Ali Khelifa and Bruce Hollebhone. So again, we're hoping there won't be any disruption, but we did want to just let you know that they are on call for that purpose.

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15664. So subject to any questions that you may have, we can go ahead and start with the swearing in of the witnesses.

15665. **THE CHAIRPERSON:** Thank you, Ms. Anderson.

15666. Ms. Niro, could we please have the witnesses sworn or affirmed?

15667. And just as Ms. Niro is getting ready to do that, I confirm that we have not received any objections to qualifying any of the experts that you may be wanting to bring forward on this panel.

15668. So rather than calling for comments on the qualifications of each proposed witness of this panel or each proposed expert of this panel, I would ask parties to come forward if they wish to make comments on any of the proposed experts as they're being presented.

15669. Thank you.

HEATHER DETTMAN: Affirmed

BRUCE HOLLEBONE: Affirmed

ALI KHELIFA: Affirmed

GRANT HOGG: Affirmed

BONNIE ANTCLIFFE: Affirmed

JOHN FORD: Affirmed

STEVEN GROVES: Affirmed

CHRIS DOYLE: Affirmed

DANIEL ESLER: Affirmed

THOMAS KING: Affirmed

PATRICK O'HARA: Affirmed

KENNETH MORGAN: Affirmed

SEAN BOYD: Affirmed

JENNIFER WILSON: Affirmed

15670. **THE CHAIRPERSON:** Thank you very much, Ms. Niro.

15671. Dr. Brown, are you on the line?

--- (No response/Aucune response)

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15672. **THE CHAIRPERSON:** Let's go on to the next one, Ms. Niro, and see if Dr. Brown calls back in.

RICHARD HOLT: Affirmed

XUEBIN ZHANG: Affirmed

CARL BROWN: Affirmed

15673. **THE CHAIRPERSON:** Thank you, Ms. Niro.

15674. For the witnesses who were previously sworn or affirmed in Prince George, could I ask you to confirm that you remain under oath?

15675. Ms. Maclean, can you confirm that you remain under oath?

LAURA MACLEAN: Resumed

CAROLINE CAZA: Resumed

MICHAEL ENGELSJORD: Resumed

BRAD FANOS: Resumed

TRACEY SANDGATHE: Resumed

BARRY SMITH: Resumed

CORAL deSHIELD: Resumed

15676. **THE CHAIRPERSON:** Have we missed anyone?

15677. Sorry; my apologies. Mr. Clarke.

JOHN CLARKE: Resumed

15678. **THE CHAIRPERSON:** Thank you very much.

15679. Mr. Friesen?

--- EXAMINATION BY/INTERROGATOIRE PAR MR. FRIESEN:

15680. **MR. FRIESEN:** Thank you. Good morning. I'll endeavour to start to my right here and work my way down the row as we introduce and present each witness to you.

15681. So Mr. John Clarke is the Director of Environmental Assessment with Natural Resources Canada. He is here to speak today in a general manner to

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Natural Resources Canada's filed evidence. Mr. Clarke was previously sworn in in these proceedings on November the 23rd of last year, and he's going to be the lead for Natural Resources Canada's witnesses on Panel Number 1.

15682. Dr. Heather Dettman, to his right, a research scientist with Canmet Energy with Natural Resources Canada, she is here to speak to issues of diluted bitumen, composition and corrosivity on behalf of Natural Resources Canada. An affidavit adopting Dr. Dettman's evidence was filed on April the 19th, 2013, and I have to ask Ms. Niro for an exhibit number for that document, as we don't have one yet.

15683. **THE REGULATORY OFFICER:** That will be Exhibit E9-65.

--- **EXHIBIT NO./PIÈCE No. E9-65:**

Affidavit adopting evidence of Dr. Heather Dettman dated April 19, 2013

15684. **MR. FRIESEN:** Thank you.

15685. Madam Chair, Dr. Dettman is being tendered as an expert in the area of diluted bitumen composition and corrosivity.

15686. And Dr. Dettman, can I ask, have you given expert evidence before a regulatory or court proceeding previously?

15687. **DR. HEATHER DETTMAN:** No, I have not.

15688. **THE CHAIRPERSON:** The Panel accepts Dr. Dettman as an expert to give opinion evidence in the areas you've identified, Mr. Friesen.

15689. **MR. FRIESEN:** Thank you.

15690. Dr. Bruce Hollebhone, you are a chemist with Environment Canada; is that correct?

15691. **DR. BRUCE HOLLEBONE:** Yes, it is.

15692. **MR. FRIESEN:** And you are here to speak to issues related to the behaviour and fate of oil on behalf of Environment Canada?

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15693. **DR. BRUCE HOLLEBONE:** Yes, I am.
15694. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding. Can you confirm that it was prepared by you or under your direction and control and is accurate, to the best of your knowledge and belief?
15695. **DR. BRUCE HOLLEBONE:** It was prepared by me, but it is about a year out of date, and there are particularly more -- a few more publications on the list now.
15696. **MR. FRIESEN:** Subject to those corrections, is the ---
15697. **DR. BRUCE HOLLEBONE:** It is correct, yeah.
15698. **MR. FRIESEN:** Thank you.
15699. Madam Chair, Dr. Hollebhone is being tendered as an expert in the areas of -- now, hold with me -- the fate and behaviour of oil and petroleum products in the environment, simulating spill behaviours in the laboratory, environmental forensics for oil spill suspect source identification and environmental emergencies response and damage assessment.
15700. Dr. Hollebhone, have you previously given expert evidence before a regulatory or court proceeding?
15701. **DR. BRUCE HOLLEBONE:** I have not, no.
15702. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. Hollebhone as an expert to give opinion evidence in the areas you've identified.
15703. **MR. FRIESEN:** Thank you.
15704. Dr. Ali Khelifa, you are a research scientist and head of the spill modelling unit with Environment Canada?
15705. **DR. ALI KHELIFA:** Yes, I am.
15706. **MR. FRIESEN:** And you are here to speak to oil spill modelling issues on behalf of Environment Canada?

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15707. **DR. ALI KHELIFA:** Yes, that's correct.
15708. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding. Can you confirm that it was prepared by you or under your direction and control and is accurate, to the best of your knowledge and belief?
15709. **DR. ALI KHELIFA:** Yes, I confirm that.
15710. **MR. FRIESEN:** Madam Chair, Dr. Khelifa is being tendered as an expert in the area of oil spill modelling.
15711. Dr. Khelifa, have you previously given expert evidence before a regulatory or court proceeding?
15712. **DR. ALI KHELIFA:** No, I haven't.
15713. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. Khelifa as an expert to give opinion evidence in the area you have identified.
15714. **MR. FRIESEN:** Thank you.
15715. Mr. Grant Hogg, you are a Director of the Environmental Emergencies Program in the Environmental Protection and Operations Directorate with Environment Canada?
15716. **MR. GRANT HOGG:** Yes, I am.
15717. **MR. FRIESEN:** And you are here to speak to issues related to environmental emergencies on behalf of Environment Canada?
15718. **MR. GRANT HOGG:** Yes, I am.
15719. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding.
15720. Can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15721. **MR. GRANT HOGG:** Yes, I prepared it.

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15722. **MR. FRIESEN:** Ms. Laura Maclean is the Head of the environmental assessment with Environment Canada. She is here to speak to general environmental assessment issues related to Environment Canada's evidence.
15723. Ms. Maclean was previously sworn in these proceedings on November 23rd, 2012.
15724. To her right, Dr. Caroline Caza is the Executive Director of the Environment Assessment and Marine Programs with Environment Canada. She is here to speak to general environmental assessment issues related to Environment Canada's evidence. She will be the lead for Environment Canada's witnesses on Panel No. 1.
15725. Dr. Caza was previously sworn in last fall as well.
15726. Mr. Michael Engelsjord is the Habitat Regulatory Team Lead of the Fisheries Protection Program with Fisheries and Oceans Canada. He is here to speak to DFO's evidence related to application of legislation, policy and Fisheries and Oceans' review of the Project.
15727. Mr. Engelsjord was previously sworn in and qualified as an expert in these proceedings on November 23rd of last year in the area of fish habitat biology and the impacts of project development on fish and fish habitat.
15728. Ms. Bonnie Antcliffe is the Regional Director of the Ecosystem Management Branch with Fisheries and Oceans Canada. She is here to speak to evidence concerning DFO's Ecosystem Management Branch programs, including oceans and species at risk and legislation and policy questions related to DFO's evidence.
15729. Ms. Antcliffe is the lead witness for Fisheries and Oceans Canada's witnesses on Panel No. 1. An affidavit adopting Ms. Antcliffe's evidence was filed on April the 18th as part of Exhibit E9-64-6.
15730. Dr. John Ford is the Program Head of Cetacean Research in the Conservation Biology Section at the Pacific Biological Station with Fisheries and Oceans Canada. Dr. Ford is here to speak to cetaceans -- being whales, dolphins and porpoises -- and the potential impacts on these species on behalf of DFO.
15731. An affidavit adopting Dr. Ford's evidence was filed on April 18th as

- part of Exhibit E9-64-6.
15732. Madam Chair, Dr. Ford is being tendered as an expert in the status, abundance, distribution, life history, ecology and behaviour of cetaceans -- being whales, dolphins and porpoises -- in British Columbia and the potential impacts of anthropogenic activities on cetaceans in B.C.
15733. Dr. Ford, have you previously given expert evidence before any court or regulatory proceeding?
15734. **DR. JOHN FORD:** Yes, I've been qualified as an expert witness in Crown prosecutions on whale disturbance on four separate occasions and also with the Cohen Commission of Inquiry.
15735. **MR. FRIESEN:** Madam Chair?
15736. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. Ford as an expert to give opinion evidence in the area you've identified.
15737. **MR. FRIESEN:** Mr. Steven Groves is a Section Head, Salmon and Herring Resource Management with Fisheries and Oceans Canada. Mr. Groves is here to speak to DFO evidence related to fisheries management issues. An affidavit adopting his evidence was filed on April 18th, 2013 as part of Exhibit number E9-64-6.
15738. Mr. Brad Fanos is the Regulation Review Manager of the Fisheries Protection Program with Fisheries and Oceans Canada. Mr. Fanos is here to speak to legislation and policy issues related to the *Fisheries Act* on behalf of DFO.
15739. He was previously sworn in, in these proceedings on November 23rd of 2012.
15740. Back to the second row where I can almost see people:
15741. Mr. Chris Doyle, you are a Manager of Science, Research and Development with Environment Canada?
15742. **MR. CHRIS DOYLE:** Yes.

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15743. **MR. FRIESEN:** And you are here to speak to meteorology issues on behalf of Environment Canada?
15744. Your CV was filed as part of Exhibit E9-53-4 in this proceeding, can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15745. **MR. CHRIS DOYLE:** Yes, it is.
15746. **MR. FRIESEN:** Madam Chair, Mr. Doyle is being tendered as an expert in meteorology, climatology and wave statistics of the Douglas Channel and Canadian waters off the North Coast -- of the North Coast, excuse me.
15747. Mr. Doyle, have you previously given expert evidence in any regulatory or court proceeding?
15748. **MR. CHRIS DOYLE:** No.
15749. **MR. FRIESEN:** Madam Chair?
15750. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Mr. Doyle as an expert to give opinion evidence in the areas that you've identified.
15751. **MR. FRIESEN:** Thank you.
15752. Next to Mr. Doyle is Mr. Phil Wong with Environment Canada. Mr. Wong is here as a support person for Environment Canada's witnesses.
15753. Dr. Dan Esler, you are a University Research Associate and an Adjunct Professor at the Center for Wildlife Ecology in the Department of Biological Sciences at Simon Fraser University in British Columbia?
15754. **DR. DAN ESLER:** Yes, I am.
15755. **MR. FRIESEN:** And you are here to speak to issues related to marine birds on behalf of Environment Canada?
15756. **DR. DAN ESLER:** Yes.
15757. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this

Government of Canada Panel 1
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- proceeding, can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15758. **DR. DAN ESLER:** Yes, it is.
15759. **MR. FRIESEN:** Madam Chair, Dr. Esler is being tendered as an expert in the area of marine bird ecology and marine bird population consequences of oil spills.
15760. Dr. Esler, have you previously given expert evidence before any court or regulatory proceeding?
15761. **DR. DAN ESLER:** No, I have not.
15762. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. Esler as an expert to give opinion evidence in the areas that you've identified.
15763. **MR. FRIESEN:** Ms. Coral deShield, you were the Head of the Program and Planning Coordination Unit with the Canadian Wildlife Service?
15764. **MS. CORAL deSHIELD:** That's right.
15765. **MR. FRIESEN:** And you are here to speak to species at risk and migratory birds issues on behalf of Environment Canada?
15766. **MS. CORAL deSHIELD:** Yes.
15767. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding, can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15768. **MS. CORAL deSHIELD:** Yes.
15769. **MR. FRIESEN:** Dr. Barry Smith, to Ms. deShield's right, is the Regional Director of the Pacific and Yukon Region with the Canadian Wildlife Service of Environment Canada. He is here to speak to species at risk and migratory birds issues.
15770. Dr. Smith was previously sworn in in these proceedings on November 23rd of last year.

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15771. **DR. BARRY SMITH:** Correct.
15772. **MR. FRIESEN:** Mr. Thomas King, you are the Head of Specialized Lab Analysis at the Centre for Offshore Oil and -- Oil, Gas and Energy Research with Fisheries and Oceans Canada?
15773. **DR. BARRY SMITH:** Yes.
15774. **MR. FRIESEN:** You are here to speak to dispersant effectiveness and the study of the fate, behaviour and transport of hydrocarbons in the marine environment on behalf of DFO?
15775. **DR. BARRY SMITH:** Yes.
15776. **MR. FRIESEN:** Your CV was filed as Exhibit E9-64-5 in this proceeding, can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15777. **DR. BARRY SMITH:** Yes, it was prepared by me.
15778. **MR. FRIESEN:** Madam Chair, Mr. King is being tendered as an expert in dispersant effectiveness and the study of the fate, behaviour and transport of hydrocarbons in the marine environment.
15779. Mr. King, have you previously given expert evidence before any regulatory or court proceeding?
15780. **MR. THOMAS KING:** No.
15781. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Mr. King as an expert to give opinion evidence in the areas that you have identified.
15782. **MR. FRIESEN:** Thank you.
15783. I can't see back there. Is Mr. Peacock here?
15784. Ms. Tracey Sandgathe is the Manager of the Species at Risk Program with Fisheries and Oceans Canada. She is here to speak to DFO's evidence on application of the *Species at Risk Act* as well as related policy, operational

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- procedures and processes.
15785. Ms. Sandgathe was previously sworn in in these proceedings on November 23rd, 2012.
15786. And the back row, starting on the far stage right:
15787. Dr. Patrick O'Hara, you are a Research Biologist with the Canadian Wildlife Service Institute of Ocean Sciences with Environment Canada?
15788. **DR. PATRICK O'HARA:** That's correct.
15789. **MR. FRIESEN:** You are here to speak to birds oiled at sea issues on behalf of Environment Canada?
15790. **DR. PATRICK O'HARA:** Yes.
15791. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding, can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15792. **DR. PATRICK O'HARA:** Yes, I can.
15793. **MR. FRIESEN:** Madam Chair, Dr. O'Hara is being tendered as an expert in the area of birds oiled at sea.
15794. Dr. O'Hara, have you previously given expert evidence before any court or regulatory proceeding?
15795. **DR. PATRICK O'HARA:** No.
15796. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. O'Hara as an expert to give opinion evidence in the area that you've identified.
15797. **MR. FRIESEN:** Thank you.
15798. Mr. Ken Morgan, you are Pelagic Seabird Biologist with the Canadian Wildlife Service Institute of Ocean Sciences with Environment Canada?
15799. **MR. KEN MORGAN:** Yes, that is true.

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15800. **MR. FRIESEN:** And you are here to speak to pelagic bird issues on behalf of Environment Canada?
15801. **MR. KEN MORGAN:** Yes.
15802. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding, can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15803. **MR. KEN MORGAN:** Yes, I confirm that.
15804. **MR. FRIESEN:** Madam Chair, Mr. Morgan is being tendered as an expert in the area of open ocean and coastal marine bird issues.
15805. Mr. Morgan, have you previously given expert evidence before a regulatory or court proceeding?
15806. **MR. KEN MORGAN:** No, I have not.
15807. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Mr. Morgan to give expert -- sorry, let me try this again. The Panel accepts Mr. Morgan as an expert to give opinion evidence in the area that you've identified.
15808. **MR. FRIESEN:** Thank you.
15809. Dr. Sean Boyd, you are a research scientist in the Wildlife Research Division of the Science and Technology Branch of Environment Canada?
15810. **DR. SEAN BOYD:** Yes, I am.
15811. **MR. FRIESEN:** And you are here to speak to issues related to marine birds on behalf of Environment Canada?
15812. **DR. SEAN BOYD:** Yes.
15813. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding. Can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?

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15814. **DR. SEAN BOYD:** Yes.
15815. **MR. FRIESEN:** Madam Chair, Dr. Boyd is being tendered as an expert in near shore marine bird species, including winter and spring migration ecology and connectivity patterns of specific species to breeding grounds.
15816. Dr. Boyd, have you given expert evidence before a regulatory or court proceeding previously?
15817. **DR. SEAN BOYD:** No.
15818. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. Boyd as an expert to give opinion evidence in the area that you've identified.
15819. **MR. FRIESEN:** Thank you.
15820. Ms. Jennifer Wilson, you are a special projects officer in environmental assessment with the Canadian Wildlife Service with Environment Canada?
15821. **MS. JENNIFER WILSON:** Yes.
15822. **MR. FRIESEN:** And you are here to speak to species at risk and migratory bird issues on behalf of Environment Canada?
15823. **MS. JENNIFER WILSON:** Yes.
15824. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-58-3 in this proceeding. Can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15825. **MS. JENNIFER WILSON:** Yes.
15826. **MR. FRIESEN:** To Ms. Wilson's right is Mr. Trevor Andrews. Mr. Andrews is here as a supporting person to support Fisheries and Ocean Canada's witnesses this morning.
15827. I believe that we've introduced everybody now.
15828. **THE CHAIRPERSON:** I believe you have ---

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15829. **MR. FRIESEN:** Oh.
15830. **THE CHAIRPERSON:** --- the people who are joining remotely as witnesses ---
15831. **MR. FRIESEN:** Yes, thank you ---
15832. **THE CHAIRPERSON:** --- Mr. Friesen.
15833. **MR. FRIESEN:** --- for the reminder, Madam Chair.
15834. Dr. Zhang, are you -- can you hear me?
15835. **DR. XUEBIN ZHANG:** Yes.
15836. **MR. FRIESEN:** Dr. Xuebin Zhang, you are the acting manager and a research scientist in the Climate Data and Analysis Section in the Climate Research Division with Environment Canada; is that correct?
15837. **DR. XUEBIN ZHANG:** Yes.
15838. **MR. FRIESEN:** You are here to speak to issues involving climate change in the marine environment?
15839. **DR. XUEBIN ZHANG:** Yes.
15840. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding. Can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15841. **DR. XUEBIN ZHANG:** Yes, I can.
15842. **MR. FRIESEN:** Madam Chair, Dr. Zhang is being tendered as an expert in past and projected future changes in wind and ocean waves.
15843. Dr. Zhang, can you -- have you given expert evidence before a court or regulatory proceeding previously?
15844. **DR. XUEBIN ZHANG:** No.

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15845. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. Zhang as an expert to give opinion evidence in the area that you've identified.
15846. **MR. FRIESEN:** Thank you.
15847. Mr. Holt, can you hear me?
15848. **MR. RICHARD HOLT:** Yes, I can.
15849. **MR. FRIESEN:** Mr. Richard Holt, you are a senior program engineer in the Transportation Division with Environment Canada; is that correct?
15850. **MR. RICHARD HOLT:** Yes, I am.
15851. **MR. FRIESEN:** You are here to speak to the North American emission control area and marine emission aspects of air quality on behalf of Environment Canada?
15852. **MR. RICHARD HOLT:** Yes, that's correct.
15853. **MR. FRIESEN:** Now, your CV was filed as Exhibit E9-64-3 in this proceeding. Can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15854. **MR. RICHARD HOLT:** Yes.
15855. **MR. FRIESEN:** Madam Chair, Mr. Holt is being tendered as an expert in the North American emission control area and marine emission aspects of air quality.
15856. Mr. Holt, have you previously given expert evidence before a court or regulatory proceeding?
15857. **MR. RICHARD HOLT:** No, I haven't.
15858. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Mr. Holt as an expert to give opinion evidence in the areas that you've identified.
15859. **MR. FRIESEN:** Thank you.

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15860. Dr. Carl Brown?
15861. **DR. CARL BROWN:** Yes.
15862. **MR. FRIESEN:** You are a manager in the Emergency Science and Technology Section with Environment Canada?
15863. **DR. CARL BROWN:** Yes, I am.
15864. **MR. FRIESEN:** And you are here to speak to emergency science and technology issues on behalf of Environment Canada?
15865. **DR. CARL BROWN:** That's correct.
15866. **MR. FRIESEN:** Your CV was filed as part of Exhibit E9-53-4 in this proceeding. Can you confirm that it was prepared by you or under your direction and control and is accurate to the best of your knowledge and belief?
15867. **DR. CARL BROWN:** Yes, I can confirm that.
15868. **MR. FRIESEN:** Madam Chair, Dr. Brown is being tendered as an expert in scientific advice and support to environmental emergencies during actual oil and chemical spills.
15869. Dr. Brown, have you previously given expert evidence before any court or regulatory proceeding?
15870. **DR. CARL BROWN:** Yes, I have. I was an expert witness to the Joslyn North Mine Project Joint Review Panel in 2010.
15871. **THE CHAIRPERSON:** Mr. Friesen, the Panel accepts Dr. Brown as an expert to give opinion evidence in the areas that you've identified.
15872. **MR. FRIESEN:** Thank you. And I believe, subject to correction, that now we've introduced all the witnesses.
15873. **THE CHAIRPERSON:** Thank you, Mr. Friesen.

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15874. Mr. Leadem, good morning.

15875. **MR. LEADEM:** Good morning, Madam Chair.

15876. **THE CHAIRPERSON:** Please proceed with your questions of this panel.

--- EXAMINATION BY/INTERROGATOIRE PAR MR. LEADEM:

15877. **MR. LEADEM:** Thank you.

15878. Good morning panel members. My name is Tim Leadem. I represent a coalition of environmental groups. I had the pleasure of meeting some of you in Prince George. Dr. Caza, it's good to see you back again. Dr. Smith on the back row, and Ms. Maclean, Mr. Fanos and Mr. Engelsjord, it's good to see you back again.

15879. And I'd like to also begin by saying something that I think I said to all of you in Prince George, that it's gratifying to me personally as a citizen of Canada to see so many civil servants appear at these proceedings because the work that you do is a very important job and I'm personally gratified to see all of you here.

15880. I do have some questions. I can tell Dr. Brown and Dr. Zhang and Mr. Holt that I don't expect that I will have many questions in the areas that you have been selected to appear here on. So that isn't to say that you can simply disappear from the phone land but you can probably put your phone on mute for a while and hopefully if I do have a question we can rouse you.

15881. I'm going to focus primarily on the biology and the environmental effects upon wildlife. Those of you who met me in Prince George know that that is the position of my clients, that they have a great interest in making sure that the wildlife is protected through these processes.

15882. And I'd like to begin by asking a general question about conservation. And I think I'll open it up to the DFO people because most of my questions will be focused upon the biology represented by Department of Fisheries and Oceans.

15883. Would you agree that conservation is -- based on an ecosystem approach, is of fundamental importance to maintaining biodiversity?

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15884. **MR. MICHAEL ENGELSJORD:** Yes, we would agree.
15885. **MR. LEADEM:** Many of my questions are going to focus upon the PNCIMA, the Pacific North Coast Integrated Management Area or I believe that you're familiar with that, Mr. Engelsjord. Are you?
15886. **MR. MICHAEL ENGELSJORD:** Yes, we are.
15887. **MR. LEADEM:** And I'd like to begin with an aid to cross-examination which I trust that your counsel has shown to you in advance of these proceedings and it's the first one, AQ Number 1. It's entitled "Science Response to Information Request Submitted to the Enbridge Pipeline Project Environmental Impact Assessment Hearings Respecting Pacific North Coast Integrated Management Area PNCIMA".
15888. Can we all refer to it as PNCIMA because it's otherwise it's a bit of a mouthful?
15889. **MS. BONNIE ANTCLIFFE:** Yes, we can.
15890. **MR. LEADEM:** Thank you.
15891. I want to ask, Ms. Niro, if we can just go to page 2, under the highlighted portion beginning on February 7 and 8. And I want to ask some questions about this Pacific regional advisory process was conducted by the DFO at the Pacific Biological Station in Nanaimo which was to provide an evaluation of proposed ecologically and significant -- and biologically significant areas in marine waters of British Columbia.
15892. Did any of you on the panel attend this particular regional advisory process on that occasion?
15893. **MS. BONNIE ANTCLIFFE:** There are no members here on the panel who attended that science meeting.
15894. **MR. LEADEM:** My understanding, do you have knowledge of that particular proceeding, Ms. Antcliffe, sufficient to answer some questions?
15895. **MS. BONNIE ANTCLIFFE:** I have knowledge of the content that

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was discussed at that meeting and reference in this paper under PNCIMA, which is mostly the ecologically and biologically significant areas identified under Canada's Oceans Program.

15896. **MR. LEADEM:** All right.
15897. Can we refer to ecologically, biologically significant areas as EBSAs from here on in?
15898. **MS. BONNIE ANTCLIFFE:** Yes, we can.
15899. **MR. LEADEM:** All right.
15900. My understanding is that there was a group of scientists both from DFO, from Environment Canada, from the Province. There were some representatives from First Nations. There were some representatives from the NGO community who attended this workshop.
15901. Is that your evidence as well, Ms. Antcliffe?
15902. **MS. BONNIE ANTCLIFFE:** I was not at the meeting, but I believe that to be correct.
15903. These are standard science peer review meetings and, typically, the stakeholders that you mentioned would be the stakeholders invited to attend those sessions.
15904. **MR. LEADEM:** Is it your evidence also that none of the participants who have intervened in these proceedings were invited?
15905. For example, my clients, Living Oceans Society, Raincoast Conservation Foundation or ForestEthics Advocacy were not invited to participate in that?
15906. **MS. BONNIE ANTCLIFFE:** I can't comment on who was invited to that meeting and who wasn't invited to that meeting.
15907. **MR. LEADEM:** Okay.
15908. Let me ask you if you were familiar with the fact that the Cowichan

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First Nation was invited but none of the First Nations that are located further north were actually invited to partake of that meeting.

15909. Do you have any evidence to the contrary?
15910. **MS. BONNIE ANTCLIFFE:** I have no evidence to the contrary.
15911. **MR. LEADEM:** Now, the purpose of that meeting was to identify EBSAs, was it not, in the PNCIMA area?
15912. **MS. BONNIE ANTCLIFFE:** Yes, that's correct.
15913. **MR. LEADEM:** And, in doing so, it built upon previous work that have been done by Department of Fisheries and Oceans in identifying EBSAs and important areas -- IAs -- in the area as well.
15914. Is that not correct?
15915. **MS. BONNIE ANTCLIFFE:** That is correct.
15916. **MR. LEADEM:** I have a note that the actual participants included DFO Science Branch, DFO Fishing Management Branch, the Province of British Columbia, commercial fishing interest, some selected First Nations and some selected NGOs.
15917. Do you have any evidence to the contrary?
15918. **MS. BONNIE ANTCLIFFE:** I have no evidence to the contrary.
15919. **MR. LEADEM:** If I can ask you to turn to page 5 of that report, please, the AQ Report?
15920. Under "Analysis and Responses", it appears that a number of follow-up documents were going to be prepared, and I'm going to question you about those documents and the present status of those.
15921. The first one references a Science Advisory Report by DFO, which is in prep. Is it not the case that that has now been published as DFO Publication Document 2012/075?

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15922. **MS. BONNIE ANTCLIFFE:** That's correct, that document has been published and it is available on line on the DFO Canadian Science Advisory website.
15923. **MR. LEADEM:** Likewise, with respect to the next document, the Proceedings Report, the information indicates on this page that it's in preparation. That has since been published as DFO Publication 2012/053.
15924. Is that not correct?
15925. **MS. BONNIE ANTCLIFFE:** Yes, that document has been published on line as the proceedings or the record of the Science meeting that occurred at PBS, Pacific Biological Station.
15926. **MR. LEADEM:** Skipping down to the document listed as "Technical Report, 2006 Technical Reports", there's a document written by Clarke and Jamieson in 2006, the Identification of Ecologically Biologically Significant Areas in PNCIMA: Phase I - Identification of Important Areas."
15927. And that document indicates that it was published in "Canadian Technical Reports of Fisheries and Aquatic Sciences."
15928. Is that a peer reviewed journal, to your knowledge?
15929. **MS. BONNIE ANTCLIFFE:** That is not technically a peer reviewed document with respect to publication in the international literature. That is a DFO series of publications that we've produced internally.
15930. So, technically, it is not peer review on an international standard.
15931. **MR. LEADEM:** I'm going to turn to that document, which is Aid to Cross-Examination No. 6 in the Aids, AQ No. 6.
15932. It's the paper by Clarke and Jamieson "Identification of Ecologically Biologically Significant Areas."
15933. That's it. Thank you, Ms. Niro.
15934. This appears to be the paper that's mentioned in the AQ No. 1 that I had just referred to; is it not?

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15935. **MS. BONNIE ANTCLIFFE:** Yes, it is.
15936. **MR. LEADEM:** If we can turn to Roman numeral V, I just want to review some of the abstract with you.
15937. **THE CHAIRPERSON:** Mr. Leadem, did you highlight the portions that you wish to review with the witnesses and make sure that the witnesses had it in advance?
15938. **MR. LEADEM:** I highlighted most of the portions of the -- I don't know if there's a problem, but I did highlight most of the AQs with yellow highlighting.
15939. I wanted to talk specifically about the process here and, as will become abundantly clear, I'm hoping that some of the participants will have been familiar with this process.
15940. **THE CHAIRPERSON:** Let's proceed.
15941. Is it just that you've highlighted in yellow highlighter and that's why it's not showing up on the electronic copy?
15942. Is that why we are not seeing the highlighted portion here or am I missing the highlight?
15943. **MR. LEADEM:** Yes, you're missing the highlight on this page.
15944. **THE CHAIRPERSON:** Okay.
15945. **MR. LEADEM:** If you bear with me, I think ---
15946. **THE CHAIRPERSON:** Okay.
15947. **MR. LEADEM:** --- that I can satisfy your emerging concerns, Madam Chair.
15948. **THE CHAIRPERSON:** And just to make sure that the witnesses have had the opportunity to review the material that you'll question them on.

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15949. **MR. LEADEM:** Yes, thank you.
15950. **MS. BONNIE ANTCLIFFE:** Just to clarify, on -- this abstract page here was not highlighted for us in the document when we received it on Friday.
15951. The paragraph No. 3 on page 33 was highlighted.
15952. **MR. LEADEM:** Thank you, Ms. Antcliffe.
15953. Dr. Ford, you were part of the Delphic Process that gave rise to the identifications of EBSAs and important areas with respect to the work performed by -- is it Dr. Clarke and Dr. Jamieson?
15954. **DR. JOHN FORD:** Dr. Jamieson and Mr. Clarke.
15955. **MR. LEADEM:** Dr. Jamieson and Mr. Clarke?
15956. But you were part of that Delphic Process, were you not?
15957. **DR. JOHN FORD:** I was.
15958. **MR. LEADEM:** And, Dr. Boyd -- in the back row there -- you were part of that Delphic Process as well; were you not?
15959. **DR. SEAN BOYD:** Yes, I was.
15960. **MR. LEADEM:** And, Mr. Morgan -- also in the back row -- you were part of that Delphic Process; were you not?
15961. **MR. KEN MORGAN:** Yes, I was.
15962. **MR. LEADEM:** And just to clarify what a Delphic Process is so that we can all be on the same page, it takes its name from the Oracle *Delphi* in Greek, in which the Oracle Delphi, of course, was consulted with respect to prognostications and forecasting.
15963. And am I okay so far, Dr. Ford? I see you're nodding your head.
15964. And, essentially, it's an iterative process; is it not?

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15965. **DR. JOHN FORD:** Yes, I understand it to be that.
15966. **MR. LEADEM:** And, in fact, what happens is that a panel of experts is convened in order to answer questions, in this specific instance, about identification of the EBSAs and the PNCIMA.
15967. Is that not correct?
15968. **DR. JOHN FORD:** That's correct.
15969. **MR. LEADEM:** And the panel of experts convenes over a period of time and answers are given anonymously and then traded back and forth until the right answer is arrived at through a process of iteration and moderation over time.
15970. Is that a fair approximation of the process that was followed in this particular case?
15971. **DR. JOHN FORD:** I'm not familiar with the anonymity portion of that but, generally, yes, that's the process. It is an iterative one.
15972. **MR. LEADEM:** And as I'm -- you took part in that, I gather. I would imagine that you fed into that with respect to identification of habitat and important areas for whales.
15973. Is that fair?
15974. **DR. JOHN FORD:** That's correct, for cetaceans.
15975. **MR. LEADEM:** For cetaceans.
15976. And I imagine, Dr. Boyd and Mr. Morgan, that you likewise partake in that process in order to feed information into the process on behalf of your expertise which is grounded in mostly marine birds and pelagic birds.
15977. Is that not correct?
15978. **DR. SEAN BOYD:** That's correct.
15979. **MR. LEADEM:** Mr. Morgan?

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15980. **MR. KEN MORGAN:** Yes, that is correct.
15981. **MR. LEADEM:** Thank you.
15982. I have to do a little bit of a -- I can see you now. Thank you, Mr. Hogg.
15983. I must say I -- when I was in Prince George and cross-examined a number of you I can't remember if there are more now than there were later but we keep on setting records, at least my personal best.
15984. Eventually what transpired in this particular case with respect to the work that was performed by Mr. Clarke and Dr. Jamieson is identification of EBSA's for the PNCIMA.
15985. Do I have that evidence correct, Ms. Antcliffe?
15986. **MS. BONNIE ANTCLIFFE:** Yes and it is Ms. Clarke.
15987. **MR. LEADEM:** And this document that we have before us was in fact published as a document by Fisheries and Oceans Canada; correct?
15988. **MS. BONNIE ANTCLIFFE:** That's correct.
15989. **MR. LEADEM:** Now, if I can ask you then to go to the highlighted portion on page 33, sorry AQ-6.
15990. And I provided you with an extract and gave you a link so that you can find the whole document, just the yellow highlighting. This is my highlighting and I apologize for the -- the uncertain lines. It's done differently when you don't do it electronically I've discovered.
15991. So I'm going to address this to either Ms. Antcliffe or Mr. Engelsjord, you've had a chance to review this particular passage have you?
15992. **MS. BONNIE ANTCLIFFE:** Yes I have.
15993. **MR. LEADEM:** And it speaks to a need for consideration of moving from mere science data collection and analysis to taking on a -- what is called an EBM or Ecosystem-Based Management approach. Is that a fair statement?

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15994. **MS. BONNIE ANTCLIFFE:** That's a statement made within the context of the science reporting out on the EBSA work.
15995. **MR. LEADEM:** Do you agree with that?
15996. **MS. BONNIE ANTCLIFFE:** I agree with the points made with respect to this type of information being important to informed ecosystem-based management and integrated management.
15997. **MR. LEADEM:** There's a comment there that DFO -- much data held by DFO has only been used to date for specie-specific stock assessments.
15998. Let me just stop there. Do the representatives from DFO agree with that comment?
15999. **MS. BONNIE ANTCLIFFE:** This document was published in 2006. **The department has made progress in terms of advancing ecosystem-based management and integrated management through the ocean program since 2006.**
16000. **MR. LEADEM:** All right. And in terms of where we're at today and in terms of an analysis of this particular project, did the Department of Fisheries and Oceans use an ecosystem-based management approach to determining the potential effect upon the ecosystem of the effects of this project?
16001. **MS. BONNIE ANTCLIFFE:** Our answer to that would be no, we did not. We looked at the potential effects from this project within a context of providing advice to the panel to assist -- to assist in the environmental assessment.
16002. **THE CHAIRPERSON:** Ms. Antcliffe, if we could just get you to pull the microphone a little closer so that we can make sure that we can record all your words.
16003. Thank you.
16004. **MR. LEADEM:** Now, my understanding is that this document was prepared in 2006 and that it's currently being re-examined in light of recent evidence; is that fair?
16005. **MS. BONNIE ANTCLIFFE:** We're not familiar with that. This

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- document was published in 2006. There have been other documents published since then that provide a list of the EBSAs for this part of the Pacific north coast.
16006. **MR. LEADEM:** Well, let's see if I can do it this way, maybe if I look at some of the maps and see if we can agree that -- and these would be the specific maps that I asked you to refer to in the context of this document.
16007. If we could go to map number 4. Now, before we go there, if you could just scroll up just a wee bit more, okay. You may not be able to see the entire document. If we could just scroll up so we can find the legend at the bottom. There we go. Thank you.
16008. So the legend depicts the dark blue area is the PNCIMA boundary. And we'll scroll up in a moment to show the bounds of the PNCIMA. And then if we look to the right you'll see as part of the legend that there's a scoring and high is in red, moderate in yellow, and green is in low.
16009. So am I reading legend correctly?
16010. **MS. BONNIE ANTCLIFFE:** Yes.
16011. **MR. LEADEM:** All right. Now, in terms of the scoring and I'll have to turn to Dr. Ford and Mr. Morgan and Dr. Boyd to help me here. The scoring that's contained on these documents, when it is ranked high does that mean that it's a high -- of high significance?
16012. I see a nod in the back row from Mr. Morgan.
16013. **MR. KEN MORGAN:** Yes, that is correct.
16014. **MR. LEADEM:** So now if we can go back up to map 4, and I realize the scale of this is fairly large. PNCIMA in fact is a fairly large area covering Dixon Entrance all the way down to the north part of Vancouver Island, is it not?
16015. **MS. BONNIE ANTCLIFFE:** PNCIMA's a very large area. It covers from the Canada-B.C. border down to top of Burt's Peninsula and on the inside top of Quadra Island. So as shown there it is a very large piece of the coast.
16016. **MR. LEADEM:** All right. So it covers the international border

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- between Canada and the United States down to northern Vancouver Island; right?
16017. **MS. BONNIE ANTCLIFFE:** Correct.
16018. **MR. LEADEM:** Okay. So sticking with this particular map important areas that -- for eulachon do we have any eulachon experts on -- on the panel with DFO?
16019. Mr. Fanos, you were very helpful to me in Prince George. Do you -- do you know much about eulachon?
16020. **MR. BRAD FANOS:** No, I'm not expert in eulachon.
16021. **MR. LEADEM:** Okay. Anyone have any particular expertise in eulachon, anadromous fish?
16022. **MS. BONNIE ANTCLIFFE:** We do not have an expert here in eulachon.
16023. **MR. LEADEM:** Okay. Well, let's stick with this for the time being and see how far we can take it.
16024. If we look at this map can we agree that the area in red that's depicted -- and I'm sorry, I don't have a pointer. There's an area in red, Prince Rupert, and if we go immediately to the right of that -- Madam Niro is usually good about following.
16025. I think she's looking for a pointer for me, Madam Chair.
16026. **THE CHAIRPERSON:** Mr. Leadem, I believe you're absolutely correct. And Mr. Friesen is coming to your rescue.
16027. **MR. LEADEM:** Thank you Mr. Friesen. I forgot to commend the Department of Justice by the way for their -- how quickly they went through 29 witnesses. I couldn't have done it any better.
16028. Now, that he's handed it to me I think that -- oh, I can figure it out.
16029. Okay, so the area that I'm -- I want to focus upon is that area where the red pointer is. And given your familiarity with the geography here, would you

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- agree with that area that I just pointed to here is in fact Douglas Channel and Kitimat Arm?
16030. **MS. BONNIE ANTCLIFFE:** Yes.
16031. **MR. LEADEM:** And in fact then, the Douglas Channel, Kitimat Arm is an area that was identified at that time as important for eulachon in PNCIMA, is that not correct?
16032. **MS. BONNIE ANTCLIFFE:** That's correct.
16033. **MR. LEADEM:** Is it not still the case that that's an important area for eulachon?
16034. **MS. BONNIE ANTCLIFFE:** Yes.
16035. **MR. LEADEM:** If I can ask you now, Ms. Niro -- I'm going to jump a bit -- I'm going to go to AQ No. 5.
16036. There is a method to my madness. Thank you. It's actually the next one. I'm looking for the one on eulachon. I think it's the ...
16037. There it is. Thank you. Thank you.
16038. So this is also an aid to cross-examination which I had submitted to your counsel for your perusal prior to coming to the Panel today. It's entitled "Science Response to Information Requests Submitted to the Enbridge Pipeline Project Environmental Impact Assessment Hearings Respecting Eulachon".
16039. This is a Department of Fisheries and Oceans document; is it not?
16040. **MS. BONNIE ANTCLIFFE:** It is a Department of Fisheries and Oceans document produced by our Science Branch.
16041. **MR. LEADEM:** And if we look at the front page of the document and the portions highlighted in yellow, it appears as though this particular science response addressed the following question:

"Identify the additional information which is, in DFO's view, required so that the proposed project impacts on eulachon may

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be adequately assessed." (As read)

16042. I neglected when I showed you the earlier one but, generally, what happened with respect to these scientific documents and responses is that the regional science special response process asked a question of the Science Team to provide advice or response to Information Requests which had been submitted by intervenors to the Enbridge Northern Gateway Pipeline Project Environmental Assessment Panel Review process.

16043. So what we're seeing, in effect, is that response from your Science Branch; is it not?

16044. **MS. BONNIE ANTCLIFFE:** These documents represent a response from our Science Branch provision and the publication of the advice that they had provided to the department much earlier -- in the spring of 2012 -- such that we could use that advice to inform our evidence and, in particular, our responses to the IRs, the Information Requests.

16045. **MR. LEADEM:** If I could ask you to turn to page 5 of that document?

16046. In this case, the analysis and response is primarily focused upon eulachons; is it not, Ms. Antcliffe?

16047. **MS. BONNIE ANTCLIFFE:** Yes, they did.

16048. **MR. LEADEM:** I've highlighted under "Analysis and Responses" all three paragraphs, have you had an ample time to review this in advance of coming here to testify?

16049. **MS. BONNIE ANTCLIFFE:** Yes.

16050. **MR. LEADEM:** And do you agree and adopt that evidence as your evidence in these proceedings, the first three paragraphs that are found there?

16051. The one beginning:

"The Kitimat River is a known eulacohon spawning river..."

16052. And ending with the paragraph that begins:

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"Although spawning in these systems generally occurs in February and March...?"

16053. **MS. ANDERSON:** Madam Chair, I'm just struggling a little bit to understand the relevance or the request to adopt this as evidence of the Department.

16054. They've already submitted their written evidence. As Ms. Antcliffe said, it was based in part on the advice provided in these documents.

16055. So I'm not sure why we're now being asked to adopt late written evidence.

16056. **MR. LEADEM:** I'm not asking them to adopt late written evidence, Madam Chair, I'm simply asking them to adopt evidence ...

--- (A short pause/Courte pause)

16057. **MR. LEADEM:** I'm not seeking to tender this as an exhibit in the proceeding.

16058. I'm not seeking -- all I'm doing is asking them to review this and to ask if they've agreed or disagreed with the evidence there. If it's -- it's a simple enough question.

16059. **THE CHAIRPERSON:** Ms. Anderson, do you have any response?

16060. **MS. ANDERSON:** No, I think that clarifies matters.

16061. I was a little confused by the earlier request, but that makes more sense. Thank you.

16062. **MR. LEADEM:** So, Ms. Antcliffe, the question to you was, after reviewing -- and anyone from DFO can answer this, by the way. I'm looking to you because you seem to be the one who's spoken up.

16063. But I simply want to get DFO's position with respect to the evidence contained in those first three paragraphs that we see on that page.

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16064. **MS. BONNIE ANTCLIFFE:** Okay, I will start.
16065. I want to be clear that these documents are publication of the Science advice to questions asked to Science pertaining to our environmental assessment to assist us in providing our evidence and advice to the Panel. They are Science documents, and they are scientific conclusions.
16066. We used the content of these documents to inform our evidence, again, the information responses, so the analysis and response and the conclusions carried forward into our Information Requests.
16067. This is scientific advice to the Department, and it represents a scientific view. What it doesn't represent is the view that, from a management perspective, we put on when we provide our advice to the Panel, so we look at the proposed project and the potential impacts of those projects and the mitigation measures to reduce impacts.
16068. So, for example, we would look at the construction at the marine terminal. We would look at the potential impacts of that on fish and fish habitat. We would look at the mitigation measures proposed by the Proponent to reduce those impacts. And that would form our advice around the environmental assessment.
16069. So we just want to be clear that these documents are scientific conclusions. They are in our evidence, but they're prepared from a scientific perspective.
16070. **MR. LEADEM:** Thank you for that, Ms. Antcliffe.
16071. I'm going to come back to your answer in just a moment but the question was: Do you accept that the science contained in this -- in this passage that is highlighted there is accurate?
16072. **MS. BONNIE ANTCLIFFE:** Yes, it is accurate.
16073. **MR. LEADEM:** So I want to go back to your answer because there's a couple of questions that give rise to my asking at this time.
16074. Are you telling me that you listen to your scientists, but you don't necessarily follow your scientists?

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16075. **MS. BONNIE ANTCLIFFE:** I'm not saying that at all.
16076. I'm saying that our management decisions and advice are informed by the scientific information and the scientific conclusions that we receive.
16077. **MR. LEADEM:** But it could be the case that, once the management perspective is put upon that advice, that the science is not necessarily followed on a case-by-case basis.
16078. Is that what you're telling me?
16079. **MS. BONNIE ANTCLIFFE:** That's not what I'm telling you.
16080. The information in this document carried forward pretty much word for word into our evidence and our submission.
16081. **MR. LEADEM:** I'm going to ask you to turn to "Conclusions".
16082. Have you had a chance to review that in advance of testifying here today?
16083. **MS. BONNIE ANTCLIFFE:** Yes.
16084. **MR. LEADEM:** Now, these are the conclusions reached by the Science department?
16085. Are they your conclusions as well, the Department of Fisheries and Oceans conclusions?
- (A short pause/Courte pause)
16086. **MS. BONNIE ANTCLIFFE:** These are conclusions provided by our scientists, the authors who contributed to this work.
16087. **MR. LEADEM:** Right.
16088. Is there still significant uncertainty around the potential interaction of the proposed activities and the different life stages of eulachon?

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16089. **MS. BONNIE ANTCLIFFE:** Based on the conclusions here provided by Science, they're saying that there is uncertainty around the interactions.
16090. **MR. LEADEM:** Yes, I understand the scientists are saying that.
16091. Are you, on behalf of DFO, also saying that?
16092. **MR. BRAD FANOS:** Yeah, I think to add to that, there's uncertainty with every project proposal we may look at, and we'll look at the risk management framework to determine the risks in terms of what is known on the Project and what the likely impacts are to the given species that we're evaluating.
16093. So in terms of the uncertainty, that's where a management decision comes into place, looking at the uncertainty and then looking at the mitigations that are proposed. So there may be uncertainty, but it still provides an opportunity to provide mitigation to work through the uncertainty.
16094. **MR. LEADEM:** Yes, Mr. Fanos, but the next sentence says that the Proponent has identified mitigation for the activities. The effectiveness is uncertain.
16095. By that, I take it that the scientific advice that DFO received is that the effectiveness of the mitigative measures put forward by the Proponent with respect to eulachon was uncertain as to whether or not they would be effective.
16096. Is that not the case?
16097. **MR. BRAD FANOS:** That would be accurate.
16098. **MR. LEADEM:** So I'm sorry to keep on troubling you, Ms. Antcliffe, but I'm going to come back to you again.
16099. And I understand that this is the conclusions reached by your Science team and I just want to make it clear in my mind -- and maybe I'm a little bit thick headed this morning -- but I want to make it clear that these are the same conclusions that the Department of Fisheries and Oceans has reached with respect to the eulachon?

--- (A short pause/Courte pause)

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16100. **MR. MICHAEL ENGELSJORD:** It's Mike Engelsjord.
16101. As Bonnie said before, I just want to reiterate. So the analysis and conclusion parts of these CSAS reports were earlier versions of these at the time we were preparing our responses to information responses (sic) last June. This information was incorporated into those responses.
16102. So we've provided that to the -- like, filed that as evidence already.
16103. **MR. LEADEM:** Yes, and is it still your evidence today that these conclusions are still extant?
16104. You still abide by these conclusions?
16105. **MR. MICHAEL ENGELSJORD:** It is our evidence, yes.
16106. **MR. LEADEM:** Yes, thank you. That's what I was looking for. Thank you, Mr. Engelsjord.
16107. I wonder if we can go now to AQ -- the second one that I submitted, the one on marine fish, Ms. Niro. Thank you.
- (A short pause/Courte pause)
16108. **MR. LEADEM:** So what you should have before you now, Panel members, is a Canadian Science Advisory Science response report entitled "Science Response to Information Request Submitted to the Enbridge Pipeline Project Environmental Impact Assessment Hearings Respecting Marine Fish".
16109. Have you had an opportunity to review this in advance of coming here to give your evidence today?
16110. **MS. BONNIE ANTCLIFFE:** Yes, we have.
16111. **MR. LEADEM:** Thank you.
16112. And I'm going to ask you to then turn to page 6 of this document under "Analysis and Responses", and there is, in this case, four paragraphs beginning with:

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“The proponent has not provided additional information to DFO Ground Fish Science...” (As read)

16113. And the last paragraph begins with the sentence:

“The impacts of noise from a geophysical survey device were shown to have an impact on rockfish catch per unit effort.” (As read)

16114. Once again, this was the evidence that was submitted by your scientists to the Department of Fisheries and Oceans; was it not?

16115. **MS. BONNIE ANTCLIFFE:** That’s correct.

16116. **MR. LEADEM:** And did that scientific evidence inform your evidence in these proceedings?

16117. **MS. BONNIE ANTCLIFFE:** Yes, the content of the analysis and response and the conclusions was copied forward in our evidence provided to the Panel.

16118. **MR. LEADEM:** Did any of the Panel members participate in this particular scientific analysis?

16119. **MS. BONNIE ANTCLIFFE:** No, they did not.

16120. **MR. LEADEM:** And I take it that, Mr. Fanos and Mr. Groves, you did not participate in the eulachon one either?

16121. **MR. BRAD FANOS:** That’s correct.

16122. **MR. STEVEN GROVES:** That is correct; I did not.

16123. **MR. LEADEM:** Do we know the identity of the scientists who provided this advice to you?

16124. **MS. BONNIE ANTCLIFFE:** Yes, it’s on page 6 of the document.

16125. **MR. LEADEM:** Okay.

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16126. So the contributors listed there under “Conclusions”?
16127. If we can just scroll down just a moment?
16128. Mr. Workman, Mr. Andrews, Mr. Davies, Nichol and Marilyn Joyce, those were the contributors and the people that provided that advice to you?
16129. **MS. BONNIE ANTCLIFFE:** That’s correct.
16130. **MR. LEADEM:** All right.
16131. And, likewise, if I look up at the conclusions, the one beginning:

“Due to the lack of data and information provided by the Proponent, there is significant uncertainty regarding the potential effects that the Proponent’s activities will have on marine fish populations or marine fisheries.” (As read)
16132. Is it still your evidence at DFO that that’s the case today?
16133. **MS. BONNIE ANTCLIFFE:** It is our evidence that there is uncertainty, as stated in the document.
- (A short pause/Courte pause)
16134. **MR. LEADEM:** Now, if we can go back again -- and I apologize, Madam Chair, for jumping around a lot -- but go back again to the Clark and Jamieson paper, the AQ No. 6, and I want to go forward to Map No. 6 now.
16135. Sorry, I have the wrong map, Map No. 8. This was one entitled “Important Areas Identified for Humpback Whales and PNCIMA”.
16136. I’m going to turn to resident cetacean expert. Dr. Ford, are you familiar with this map?
16137. **DR. JOHN FORD:** Yes, that’s correct.
16138. **MR. LEADEM:** And the map purports to depict areas in red which are highly significant areas for humpback whales within the PNCIMA.

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16139. Is that right?

16140. **DR. JOHN FORD:** That's right.

16141. **MR. LEADEM:** And once again, if we examine that map together, the area that I'm now circling with the red laser pointer -- and I apologize for the scale again -- but that area would basically cover Gil Island, the area around Gil Island, and the area encompassed by Douglas Channel, up Kitimat Arm; does it not?

16142. **DR. JOHN FORD:** That's right.

16143. **MR. LEADEM:** Now, I realize this map was prepared in 2006, is it still the case that the humpback whale important areas would have a score of "high" in that particular area, to your knowledge?

16144. **DR. JOHN FORD:** I think the -- this was prepared with data that would have been available up to 2005.

16145. **MR. LEADEM:** Yes.

16146. **DR. JOHN FORD:** I believe that, since then, we would fine tune those boundaries to better reflect improved understanding of the animals' use of the area, and that would be reflected more in our document that has been, I believe, put on as an exhibit on the critical habitat description or description of habitat that could qualify as critical habitat for humpback whales, which was in 2009.

16147. **MR. LEADEM:** Would it differ substantially from that area in red?

16148. **DR. JOHN FORD:** In minor -- in a minor way, I -- the densities of animals diminish as you go further up Douglas Channel, so I believe the boundaries would be somewhat further out than where they are shown in that diagram. But for the most part, it still reflects what is considered to be important habitat.

16149. **MR. LEADEM:** Okay. Because you refer to an area that may not be in red, I was wondering if I could give you the -- Mr. Friesen's laser pointer and ask you to describe that area that you would -- you already have your own. You

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- come well prepared.
16150. **DR. JOHN FORD:** Okay. So the area that would -- I believe that is included now or better defined would include Caamano Sound and the waters of Squally and Whale Channel around Gill Island extending up into Wright Sound, Ursula Channel in this area.
16151. This area which is up further towards the northeast is not included in that area today.
16152. **MR. LEADEM:** So you would eliminate that area in the northeast, but you would include the entrance to Caamano Sound as part of important humpback area.
16153. **DR. JOHN FORD:** That's correct.
16154. **MR. LEADEM:** All right. Thank you.
16155. Could we please go to the aid to cross-examination, the fourth one? It's the science response from -- respecting ship strike risk and acoustic disturbance from shipping to whales. It should be the next one.
16156. That's it. Thank you.
16157. Dr. Ford, my understanding is that you participated in this particular paper entitled "Science Response to Information Requests Submitted to the Enbridge Northern Gateway Project Environmental Impact Assessment Areas" respecting ship strike risk and acoustic disturbance from shipping to whales, did you not?
16158. **DR. JOHN FORD:** That's true.
16159. **MR. LEADEM:** Now, I'm going to spend some time with you with this paper. And I realize that this was the route document which has been encapsulated to large extent in the written material that you provided as part of your evidence in these proceedings. Is that fair?
16160. **DR. JOHN FORD:** That's true.
16161. **MR. LEADEM:** I want to talk about reduction of ship speeds and --

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as a mitigative measure for eliminating or trying to eliminate ship strikes.

16162. It's the case that even at low speeds of ships -- and by low speeds, I mean 10 knots and lower -- that there will be some striking of whales by ships; is that not the case?

16163. **DR. JOHN FORD:** The evidence that's available globally would suggest or does provide evidence that the probability of ship strike -- of ships striking whales increases with increasing speed. Below about 10 knots, the probability is diminished, but it is still present.

16164. **MR. LEADEM:** And is it not the case as reported by you that, based upon information from the International Whaling Commission's information, that 23 percent of all confirmed vessel strikes causing death or serious injury to whales took place at speeds of 10 knots or less?

16165. **DR. JOHN FORD:** That's correct.

16166. **MR. LEADEM:** So as a mitigative measure, you're still not entirely removing the possibility that ships will be striking whales. Is that not right, even if you reduce the speed?

16167. **DR. JOHN FORD:** That's correct.

16168. Speed is also directly related to the probability of lethality of a strike, and so the certainty of a fatal strike increases above those speeds so the -- those two factors come into play as related to speed.

16169. **MR. LEADEM:** Okay. And just for your edification, we're on page 5, by the way, of this particular document under "Analysis and Responses" in the yellowed portion.

16170. Why is it that baleen whales -- and you mentioned humpback and fin whales specifically -- seem to be more susceptible to ship strikes than other type of whales?

16171. **DR. JOHN FORD:** I think part of the reason for that is because these species tend to be the most abundant of the baleen whales at a global scale. They're -- they are also found more so than others in areas closer to coastlines where shipping is concentrated rather than being found solely pelagically on the

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- high seas where the incidents -- the risk would be lower of encountering a ship, let alone a ship being hit.
16172. There are other factors that we don't fully understand that appear to result with certain species having a higher propensity for being struck by ships than other species. This may relate to the different kinds of behavioural responses the animals do when a ship is bearing down on them, whether they get out of the way or not.
16173. It also can be affected by the behavioural state of the whales, whether they are resting or whether they are feeding. These kinds of different activities can play an important role in how they respond to various kinds of disturbance or the approach of vessels.
16174. **MR. LEADEM:** Is it something endemic to their behaviour for baleen whales that make them particularly susceptible to vessel strikes?
16175. **DR. JOHN FORD:** I'm not sure in terms of what you were -- would want to compare them to. Being a large-bodies marine organism that must spend significant time at the surface, they are far more vulnerable to ship strikes than some of the smaller species, for example, that are more agile. They're faster, and they tend not to be susceptible to being struck by large ships. I'm thinking of the smaller cetaceans, for example.
16176. So among the -- among the large whales, all the species have been recorded as being struck by ships internationally and some species are clearly more susceptible than others. The top two species are humpback whale and fin whale.
16177. And as I mentioned, all the reasons for this propensity are not fully understood.
16178. **MR. LEADEM:** My information and advice is that, particularly with respect to fin whales, they have a behaviour mechanism where they combine feeding efforts so that they gather together in groups in order to do feeding and that, at that time that they're actively engaged in feeding, that they're more susceptible, for some reason, to ship strikes than at other times.
16179. **DR. JOHN FORD:** I'm not familiar with the evidence for making that conclusion. I think there -- what I do understand is that there's much that --

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more that needs to be learned about the activity states, the behaviour states of these animals when they are struck.

16180. For example, fin whales appear to spend far more time at the surface during the night, up to 70 percent of their times, at least in one study in California, because they feed by day and essentially the -- the organisms are more dispersed during the night and they don't feed efficiently. So it may well be that they are more vulnerable at night time, for example, than they might be when they are feeding.

16181. Also, fin whales feed in different modes. They feed either at the surface in some regions, but far more commonly, they feed at depths of 200 to 250 metres and spend the majority of their time at depths where they would not be vulnerable to ship strikes.

16182. **MR. LEADEM:** Okay. That leads me -- your answer leads me to another question, which is there's been some indication that, as a mitigative measure, you could put people on the bridge to do whale spotting and to try to avoid -- do course corrections and try to avoid whales. Does that work at night?

16183. **DR. JOHN FORD:** I know of no technology that would allow animals to be reliably detected at night at a -- at a range that would allow for the alteration of a ship's course to avoid it.

16184. The -- if perhaps there was unusual concentration in one area, I imagine that could be -- could be detected with infrared technology; that technology is improving all the time but, to date, I'm not familiar with any means by which that could be done in a -- in a confident manner.

16185. **MR. LEADEM:** So with respect to your answer about fin whales at night being -- have more of a propensity to rise up to the surface, they wouldn't necessarily be spottable at night time and you would tend to conclude that it'd be more likely that the finned whales would be struck at night?

16186. **DR. JOHN FORD:** I can't conclude that.

16187. The information I mentioned was based on an unpublished study in California using data logging tags that have been used successfully to look at the responses of blue whales around -- around ships and only in a few occasions have they been able to deploy these devices on fin whales and so it's still early in that

-- in that study.

16188. There's been, in the last few years, a tremendous amount of work focused on trying to understand the interactions between ships and -- and whales to -- to improve mitigation and so, we -- we're not quite yet ready to say what proportion of fin whales, especially in -- in the area of interest here, what proportion of time they spend at the surface versus underwater in different seasons or different times of day or night.

16189. **MR. LEADEM:** Are you actively engaged in research to try to answer some of these questions about feeding behaviour in fin whales and where they may be daytime versus nighttime?

16190. **DR. JOHN FORD:** Yes, we are.

16191. We've, over the last three years, focused in particular on understanding fin whale movements, habitat use patterns, behaviour, some of which -- some of our studies have been undertaken within the area of interest in Camano Sound. Others -- we're also working out around Haida Gwaii, Dixon Entrance and places like that.

16192. So our -- our mandate and our research group is to -- is to understand habitat use patterns that would lead to us being able to recommend what areas of our coast would qualify as critical habitat for protection under the *Species at Risk Act*.

16193. **MR. LEADEM:** Can you give me a time estimate of how far away we are from giving that advice to COSEWIC and to finding critical habitat for humpback whales and fin whales?

16194. **DR. JOHN FORD:** That's a little difficult because these animals can take a significant amount of time to -- to study, to learn about in the -- to the degree of resolution that we need in order to define the functions, features and attributes of habitat so that we can identify, not just the area that the animals use, but how they use it and what resources draw them to that area and would need protection potentially.

16195. I would say we've -- we've learned a significant amount relative to what we knew five years ago just in the last few years through satellite tagging of -- of fin whales and following their movements in that manner, also by our -- our

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photo identification work which enables us to individually identify and look at individuals and then track them from year to year and look at aspects of their -- their behaviour like site fidelity, to what extent do they use habitats repeatedly.

16196. So we're -- we're still some time off, I think, from being able to provide the advice that would be needed to define critical habitat for fin whales, but it's one of our top priorities in our research group.

16197. **MR. LEADEM:** Thank you.

16198. When we were talking about the baleen whales, I also wanted to come back and talk about a couple of other species of whales that one doesn't often talk about because they seem to be more rare, and one is called the Sei whale -- am I pronouncing that right? Am I saying it right?

16199. **DR. JOHN FORD:** Some -- some -- yes, that's generally how it's pronounced.

16200. **MR. LEADEM:** Okay.

16201. And they're found in Canadian waters; are they not?

16202. **DR. JOHN FORD:** They were a very important species during the whaling era that ended in the late 1960s and in -- during the 1960s, they were the most commonly killed whale off our coast. Many thousands were taken in that period.

16203. Between the end of whaling and today, in the near-shore waters of the -- off the Pacific Coast of Canada, we've had only two sightings of this species.

16204. It -- it is a bit of a mystery why they were so abundant during the 1960s right up to the very end of whaling. Yet, they are extremely rare today. Just last year, there were four animals sighted in the outer portions of our exclusive economic zone by an international whale survey.

16205. But in the inshore waters out to at least 50 nautical miles or so that we've been able to survey over the last decade, we've not -- we've only had one reliable sighting ourselves. So they're very rare.

16206. **MR. LEADEM:** M'hm.

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16207. They're listed under SARA; are they not?
16208. **DR. JOHN FORD:** They're listed as endangered under the ---
16209. **MR. LEADEM:** As endangered?
16210. **DR. JOHN FORD:** Yes.
16211. **MR. LEADEM:** And what about blue whales, they occur within either the Confined Channel Assessment Area or the Open Waters Area?
16212. **DR. JOHN FORD:** Blue whales would not be expected to be found in the -- in the Confined Channel Assessment Area because they are more of a pelagic species. They tend to be found off the edge of the continental shelf and beyond.
16213. We have had a number of sightings in the last decade or so generally south of Haida Gwaii. That seems to be the area in which they tend to be found in recent years and also we've had sightings off the west coast of Vancouver Island, generally 75 to 90 nautical miles off shore.
16214. So they -- they are still very rare. They are listed as endangered under the *Species at Risk Act*.
16215. **MR. LEADEM:** Did I miss any major species of whales?
16216. Well, we can talk about killer whales later on. I just want to not neglect them, but push them to the side for the time being.
16217. Did I -- did I miss any other whales that are of concern to you in terms of potential impacts with this project?
16218. **DR. JOHN FORD:** Well, we have -- we have mentioned in our Information Request the grey whale ---
16219. **MR. LEADEM:** Yes.
16220. **DR. JOHN FORD:** --- which is a large baleen whale, not as large as these other species, but a significant component of the whale fauna off our coast.

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16221. It's a migratory species that, in recent years, we have found utilizes a slightly different migratory corridor than we -- than was -- has been thought for many decades. In fact, our studies have shown that they migrate up on their northbound migration back to their feeding areas in the Bering Sea after returning from breeding grounds in Baja, California; that the population tends to use Hecate Strait and Dixon Entrance as a migratory corridor which was a surprising new finding that we've just recently published.

16222. **MR. LEADEM:** Right.

16223. And you had taken the lead in terms of identification of that migratory pattern; have you not?

16224. **DR. JOHN FORD:** That's correct.

16225. **MR. LEADEM:** Right.

16226. And as I understand it then, that would shift what was known or postulated about the grey whale, shift their migration pattern more over towards the east in an area that likely would be impacted by the -- this particular project; would it not?

16227. **DR. JOHN FORD:** Grey whales are -- tend to be a very near-shore species when they're migrating.

16228. The great majority of the 20,000 approximate number of grey whales migrate within -- during the northbound migration, migrate within six or seven kilometres of the shoreline and it was long thought that when the animals having hugged the coast essentially from Baja to the northern tip of Vancouver Island simply swim across the gap, continue up the outer shore of Haida Gwaii, swim across the entrance to Dixon Entrance and then carry on up southeastern Alaska and through the -- through the Aleutians into the Bering Sea.

16229. What we have found is that the behaviour pattern shifts somewhat at the top of Vancouver Island. The animals turn northeast. They tend to swim -- this was done by satellite tracking of individuals plus shore-based surveys, I should add, in Hecate Strait and -- and Dixon Entrance.

16230. So the animals turn northeast when they round the top of Vancouver

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- Island and they migrate up Hecate Strait, favouring the eastern side of Hecate Strait to -- until they get to Rose Spit and then they either -- well, they go around Rose Spit at the top of Hecate Strait and then they carry on through Dixon Entrance either by cutting straight up to Alaska or diagonally across Dixon Entrance and then they carry on with their typically near shore migration from that point on.
16231. So the -- the migration corridor in Hecate Strait appears to be somewhat broader than in terms of its east-west orientation than the corridor when they're in near-shore waters.
16232. **MR. LEADEM:** Now, you've been talking about some geography and it occurs to me that maybe a map might be helpful.
16233. There is a map at Figure 3, the next page, I believe, or a couple of pages, and I know that this depicts critical habitat for a humpback, but I wondered if you could use that map and talk about the migratory pathway for grey whales using that particular map?
16234. **DR. JOHN FORD:** Certainly. The corridor would start in Canadian waters after the animals have rounded Cape Flattery, and they make landfall generally along here. And I should add that this is the northbound migration that takes place from early March through mostly until mid-April, but then mothers with their newborn calves follow in May. But during the peak of the migration, approximately up to 20,000 animals migrate in this manner.
16235. So they carry on up the coast of Vancouver Island very closely to the shore. They either go through Scott Channel here. They appear to from our satellite tracking. And then they cut across Queen Charlotte Sound, up Hecate Strait, around Rose Spit at the northeastern corner of Haida Gwaii and then out Dickson Entrance up here.
16236. **MR. LEADEM:** And do we know much about the return -- when they return to Baja, California, do we know the route by which they travel?
16237. **DR. JOHN FORD:** The southbound route is very poorly known, primarily because of the challenges of finding the animals during late December and early January and when the migration takes place towards the south, generally because of inclement weather, sea conditions and very short days.

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16238. But what information is available suggests that they maintain more of an offshore route, and it would take them down beyond -- probably not down through Dickson Entrance and Hecate Strait but down the outside waters. The southbound migration occurs fairly quickly. The animals swim faster in order to get to the lagoons in Mexico.
16239. **MR. LEADEM:** Warmer waters. Thank you.
16240. So in light of that, what you're suggesting is that more work be done in order to identify potential impacts between this project and the migratory grey whales on their northward bound journey. Is that fair?
16241. **DR. JOHN FORD:** There's still much we need to learn about this migration pattern. As I mentioned, the females with their newborn calves follow about a month or six weeks after the main migration. We don't know what the route of those individuals may be. We assume it's going to be the same, but we would very much like to have a better idea of that.
16242. In terms of the interaction with vessels, grey whales tend not to be in the top group of whales that are struck. I believe this is fundamentally because they are typically found in waters very close to shore where large ships tend not to be, but they certainly have been documented as being vulnerable to ship strikes in waters outside of British Columbia, down in California, off Washington State and in Alaska.
16243. So this -- I think this -- certainly in terms of the concentration of all kinds of shipping activity off of Canada's West Coast, I think we need to reassess the vulnerability of grey whales with respect to this new understanding of their migration corridor.
16244. **MR. LEADEM:** Thank you for that evidence.
16245. Madam Chair, I'm going to move on to acoustic disturbance, and I was wondering if this might be an appropriate time to take a midmorning break?
16246. **THE CHAIRPERSON:** Mr. Leadem, it's a little early. How long do you expect to be with the acoustic disturbance questions?
16247. **MR. LEADEM:** Probably -- I think I'm about midway through my questions, and I wanted to have a chance to look through my material here

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because we're covering things much more quickly than I anticipated.

16248. **THE CHAIRPERSON:** Then let's take the break and allow you that opportunity.

16249. **MR. LEADEM:** Thank you.

16250. **THE CHAIRPERSON:** So let's come back at 10 o'clock please.

16251. Thank you.

--- Upon recessing at 9:43 a.m./L'audience est suspendue à 9h43

--- Upon resuming at 10:03 a.m./L'audience est reprise à 10h03

BONNIE ANTCLIFFE: Resumed

MICHAEL ENGELSJORD: Resumed

BRAD FANOS: Resumed

JOHN FORD: Resumed

STEVEN GROVES: Resumed

THOMAS KING: Resumed

TRACEY SANDGATHE: Resumed

CAROLINE CAZA: Resumed

SEAN BOYD: Resumed

CARL BROWN: Resumed

CORAL deSHIELD: Resumed

CHRIS DOYLE: Resumed

DAN ESLER: Resumed

GRANT HOGG: Resumed

BRUCE HOLLEBONE: Resumed

RICHARD HOLT: Resumed

ALI KHELIFA: Resumed

LAURA MACLEAN: Resumed

KEN MORGAN: Resumed

PATRICK O'HARA: Resumed

BARRY SMITH: Resumed

JENNIFER WILSON: Resumed

XUEBIN ZHANG: Resumed

JOHN CLARKE: Resumed

HEATHER DETTMAN: Resumed

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16252. **THE CHAIRPERSON:** It's hard to count all the heads with the size of the witness panel, but it looks like everybody is back. Can I get confirmation that the witness panel is reassembled? Terrific. Thank you very much.

16253. Mr. Leadem, please continue with your questions.

16254. **MR. LEADEM:** Thank you, Madam Chair.

**--- EXAMINATION BY/INTERROGATOIRE PAR MR. LEADEM:
(Continued/Suite)**

16255. **MR. LEADEM:** Dr. Ford, I want to come back to talking about cetaceans. My clients are obviously very interested in whales and what may happen should this project proceed.

16256. I want to talk to you about acoustic disturbance. My information is that the humpback whale in particular is a species of whale that's highly dependent upon acoustic communication. Is that right?

16257. **DR. JOHN FORD:** That is correct. It's hard to say whether it is more reliant on acoustics than other baleen whales. It tends to have very pleasant vocalizations to the human ear, and so often we think of humpback whales as being more acoustically oriented, but other species make use of the acoustic channel as well.

16258. **MR. LEADEM:** Is it the case that tanker traffic increases and tanker traffic that may arise as a result of this project going forward will have a potential effect upon the acoustic environment to whales?

16259. **DR. JOHN FORD:** There's growing concern, I think, internationally, that increasing levels of ocean noise due to shipping has a potential impact on the -- on whales of all species, either through disturbance responses because of volume at close range from sound sources, but also from masking of the animals' own sounds that they use to communicate for various social reasons and possibly to navigate.

16260. **MR. LEADEM:** I've read some reports that some humpback whales are trying to undo the masking by developing songs and vocalizations to compete with the sound of tankers.

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16261. Are you aware of that work?
16262. **DR. JOHN FORD:** I'm not aware of that work, no.
16263. **MR. LEADEM:** All right.
16264. What about sound in closed channels or confined channels, is there some sort of amplification of sound if it's in a closed confined channel as opposed to the open ocean?
16265. **DR. JOHN FORD:** I'm not a physicist, but to the best of my knowledge, sound propagation is affected by all sorts of different qualities in the water column: salinity; depth; substrate type, whether it's hard or soft.
16266. In the case of confined channels like we have on the coast, steep and deep fjords, there's the potential for channelling and ducting of sounds, reverberation from rocky steep shorelines and so on. But I would not be able to say to what extent it is unique to those kinds of features or what the implications would be specifically about attenuation or propagation of noise in detail.
16267. **MR. LEADEM:** To your knowledge, has anyone done any studies of sound propagation in close confined channels such as the ones that are being described by the CCAA here and related it to what effect, if any, those kinds of acoustic disturbances will have upon whales?
16268. **DR. JOHN FORD:** The work that was undertaken by Enbridge and its consultants looked at these kinds of questions. There was extensive modelling exercise done with initially hypothetical sound sources, or at least those based on similar ships in other areas.
16269. And then there was an acoustic supplement prepared by the Proponent last year that took real measurements of noise levels from ships and tugs -- support tugs in Prince William Sound and used that information to recalibrate their modelling exercise specific to projecting what sound levels would be in various -- at various locations along the inner confined channel area as well as in the outer water area.
16270. And then using the hearing sensitivity, as far as we understand it for humpback whales and killer whales, they estimated the range over which sound would propagate or be audible to the animals and how many decibels above their

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threshold these levels would be, again, based on this modelling exercise.

16271. **MR. LEADEM:** Is -- does that remove the uncertainty in your mind as to what effect the project may have upon these whales with respect to acoustic disturbances?

16272. **DR. JOHN FORD:** I think that work has gone a long way towards better -- being better able to understand the level of noise that we can imagine or expect the animals to be exposed to. There is still considerable uncertainty about what those sounds might -- what impact those sounds could potentially have on the animals and that's basically because we don't know enough about how the animals use sounds generally and even specifically in these local habitats.

16273. We know that the animals are acoustically very sensitive but they -- and that they do use sounds for various different purposes. In the case of humpback whales for example, they use sounds to coordinate their feeding activities when they are working in a cooperative feeding kind of behaviour state. And this is something that we see fairly regularly in the confined channels area.

16274. They also use sounds in the fall to -- the males vocalize to begin their breeding displays prior to migration to warmer climes for the winter and so there's extensive singing, but to a large extent the animals forage in silence as well. So we don't really understand enough about how the animals use their sounds and to what degree they rely on them to function in their habitat to really, I think, confidently estimate what the impacts may be of noise at different levels.

16275. **MR. LEADEM:** Is it a question that we need to study this a bit more or that we need to focus our attention upon this in terms of research projects before we're in a position of answering it to remove some of that uncertainty about what effect tanker traffic and acoustic disturbances are going to have upon these species of whales?

16276. **DR. JOHN FORD:** Yes, that's very true. There's been great advances in recent years but there's still much more to learn before we can really confidently make predictions about levels of impacts from ship noise.

16277. **MR. LEADEM:** And we've been talking mostly about humpback whales and I guess you would put in killer whales in that same category, would you not?

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16278. **DR. JOHN FORD:** Yes, all the cetaceans use sound underwater for -- to various degrees. Some are more vocal than others. Killer whales have eco-location they use to navigate and to find prey. That's an ability that the baleen whales, like humpback whales, do not seem to have, so they may -- their behaviours, their -- the extent to which they can function in habitats that are insonified with noise may differ so they need to be looked at very differently or separately.
16279. **MR. LEADEM:** In terms of the killer whales, if we can just examine very quickly Figure 4 that's contained within that aid to cross. The caption on that figure is the location extent of identified potential critical habitat for northern resident killer whales in Caamano Sound area. You prepared this obviously, it seems to indicate that you're responsible for this mapping, is that right?
16280. **DR. JOHN FORD:** That's correct.
16281. **MR. LEADEM:** And that's a fair and accurate depiction of the -- what you would call critical habitat for northern resident killer whales in that area?
16282. **DR. JOHN FORD:** It's certainly important habitat. As far as its definition as critical habitat under the *Species at Risk Act*, it has not been designated as critical habitat.
16283. **MR. LEADEM:** Yes, I understand that.
16284. **DR. JOHN FORD:** Yes.
16285. **MR. LEADEM:** I'm not trying to pin you down under ---
16286. **DR. JOHN FORD:** Right.
16287. **MR. LEADEM:** --- a SARA designation, I simply want to get some clarification of what you depicted in blue here.
16288. **DR. JOHN FORD:** M'hm.
16289. **MR. LEADEM:** Now, in terms of the northern resident killer whale, let's break it down. There's a northern resident killer whale population which has been designated under the *Species at Risk Act* separately from a northern transient

- killer whale population, is that right?
16290. **DR. JOHN FORD:** Yes.
16291. **MR. LEADEM:** All right. Have we done any studies on the northern transient killer whale in terms of where they may reside and where they may go to enable us to put forward a map similar to the one you've depicted here?
16292. **DR. JOHN FORD:** We are -- we have undertaken these analyses recently based on about 40 years of data with these transient killer whales as they are called. These are mammal hunting specialists, they move very widely along the coast but they tend to prefer near shore waters.
16293. So we've just completed an assessment of potential critical habitat for transient killer whales and the area has not been designated. What we have proposed might qualify as critical habitat is a very extensive portion of the Canadian coastline, basically waters extending out to three nautical miles from shore. This is where the animals forage, where over 90 percent of all their predation takes place is very close to shore.
16294. And this area here would be included because we've included essentially all marine waters within three nautical miles simply because these animals are so wide ranging they utilize all portions of the coast.
16295. **MR. LEADEM:** How far away are we from defining that area more precisely? Can you estimate in terms of years? Is it, you know, are we at that in a matter of years we can arrive at similar mapping for northern transient killer whales?
16296. **DR. JOHN FORD:** There's really -- the population we refer to is the west coast transients and these animals move so widely that there wouldn't really be anything such as a northern transient for example, as you mentioned.
16297. The animals that we see off southern Vancouver Island are often seen as far north as Glacier Bay, Alaska. They move easily up to 100 nautical miles a day and they -- there is sight fidelity of some groups of these predators in different portions of the coast, but essentially, they all make use of the entire coastline.
16298. So I don't believe that we'll have any higher resolution of defining

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spatial areas that are of particular importance beyond what we have done in this recent exercise.

16299. **MR. LEADEM:** I'm going to ask you to turn to the conclusions reached in the science response. To a large extent, these have been incorporated within the written evidence of Canada. I think the reference, Madam Chair, is E9 -- I just had it here -- E9-21-06.

16300. The question is a simple one at this stage though, Dr. Ford. Having had a chance to review the conclusions, are those still the same conclusions that you maintain today?

16301. **DR. JOHN FORD:** Yes.

16302. **MR. LEADEM:** Are you familiar with the marine mammal protection plan that was put forward by the Proponent?

16303. **DR. JOHN FORD:** Yes I am.

16304. **MR. LEADEM:** There's a comment there, the second sentence, and I wonder if I can either ask you or Ms. Sandgathe or someone who has some knowledge of this to expand upon it.

"It's not clear if the Proponent will be legally obligated to abide by such a plan." (As read)

16305. I'm not sure where that comes from. Is anyone competent to be able to speak to that particular sentence and why that's there or what information provided the background for that?

16306. **DR. JOHN FORD:** I'm afraid I can't. I'm not sure where that statement came from.

16307. **MR. LEADEM:** Okay.

16308. **MR. MICHAEL ENGELSJORD:** I could maybe shed a bit of light. I think at the time that this was written, it was -- nobody really knew exactly how these would carry forward. And of course, these are our scientists who don't work on the regulatory side either. So I think they just weren't sure how this would be implemented. Yes.

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16309. **MR. LEADEM:** What's the information or what's the position of Department of Fisheries and Oceans with respect to the marine mammal protection plan put forward by the Proponent? Does it have a position, does it intend to review it with the Proponent?
16310. **DR. JOHN FORD:** Yes. That, I understand, is the intention of the Proponent to review this with DFO and with other interest groups to better define it over the course of going forward. I've been able to review the -- essentially the first draft, I think, was prepared last summer, 2012, and -- but I understand that that is very much a draft and is open to revision as needed.
16311. **MR. LEADEM:** It's a work in progress is it not? Is that fair?
16312. **DR. JOHN FORD:** That's what I understand it to be.
16313. **MR. LEADEM:** But I understand by your testimony here today that DFO is committed to working with the Proponent in examining that marine mammal protection plan, is that the case, Mr. Engelsjord?
16314. **MR. MICHAEL ENGELSJORD:** Yeah, that's what we would anticipate.
16315. **MR. LEADEM:** In the fourth paragraph -- I just want to get some clarification -- I understand that this is the scientists so I'm going to jump from the scientists back to the management side of DFO.
16316. There's a statement that candidate critical habitat areas for humpback whales and northern resident killer whales have previously been identified and overlap the CCAA, that's the confined channel assessment area, is that still the case, Mr. Engelsjord?
16317. **MR. MICHAEL ENGELSJORD:** I believe so. John noted there's some minor changes to the humpback whale important area previously but I believe it's still the case.
16318. **MR. LEADEM:** Okay. And then if I can try to get a timeline on the last conclusion drawn there, Dr. Ford, where you say:

"It's not possible [...] [for DFO science] to determine

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acceptable noise thresholds in the [...] CCAA in the absence of additional modelling and in-field measurements.”

16319. What would it take to actually get that science to a position where you can determine whether or not the noise thresholds are acceptable or not?
16320. **DR. JOHN FORD:** This document, I think, was prepared before the acoustic supplement was prepared by the Proponent and that, as I described it earlier, has, I think, provided useful information on the -- and more potentially accurate information on what the noise levels may be expected to be.
16321. And in the CCAA, what is really lacking is an understanding of the fine scale distribution -- seasonally, day and night, et cetera of whales in the area to better predict how much sound exposure they will have and also what their activities are in the area to understand better to what extent masking from ship noise may affect their -- the range over which they can communicate and to what extent they may -- it may interfere potentially with activities that require use of acoustic communication such as coordinated feeding and so on.
16322. So what is needed, I think, is more field work to better understand how the animals are using the habitat and to what extent acoustics plays a role in those behaviours.
16323. **MR. LEADEM:** Let's go back to the Clarke paper and take a look at a couple of maps that were attached. So we started the discussion with the humpback whales and I wondered if we could now move to map 12. So this appears to be the same mapping technique that was performed as a result of this delphic process for finned whales, was it not, Dr. Ford?
16324. **DR. JOHN FORD:** Yes, that's correct.
16325. **MR. LEADEM:** Given the fact that this was 2006, are there any modifications, to your knowledge, that you would draw upon this map with today's knowledge?
16326. **DR. JOHN FORD:** Yes, I could perhaps just quickly point out that it's generally still pretty accurate. With what we now understand, however, I would tend to include the areas on eastern Hecate Strait up to the north end of Banks Island on the eastern -- so extending it right here. So this would be, sort of included, these waters up to and around Bonilla Island.

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16327. **MR. LEADEM:** So if I have your information correctly, you would extend the yellow polygon northward up along Banks Island?

16328. **DR. JOHN FORD:** That's right.

16329. **MR. LEADEM:** And it still would be yellow designation, in your view?

DR. JOHN FORD: Yes.

16330. **MR. LEADEM:** Thank you.

16331. **DR. JOHN FORD:** I could add -- if I could just add one comment on that? Yellow relates to moderate. At the time we prepared this map, we didn't have much information on areas of particularly high density or high use by finned whales. We were -- as part of our recent work since then, we've -- we're starting to identify areas that may be ultimately Canada critical habitat areas.

16332. We're still a ways off but if we were to do this map again, we'd probably be able to at least identify some high use areas.

16333. **MR. LEADEM:** So within this area?

16334. **DR. JOHN FORD:** Within this yellow area but this does capture what we consider to be the primary habitat.

16335. **MR. LEADEM:** Okay. And just sticking with that map, just for clarification purposes, the area -- the entrance to Gill Island, Caamano Island -- Caamano Sound is right in that area that I'm circling right now with the laser pointer, is it not?

16336. **DR. JOHN FORD:** Yes, that's correct.

16337. **MR. LEADEM:** Okay. And you would take another look at this map and see if any areas should be designated as red as high, as opposed to yellow; that's what you're telling me?

16338. **DR. JOHN FORD:** That's right.

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16339. **MR. LEADEM:** I want to leave whales now and go to marine mammals and I'm not sure, Dr. Ford, if I'm going to be able to call upon your expertise but I'm going to try to see if I can answer some of the queries I have with respect to marine mammals, such as sea otters and Steller sea lions.
16340. I know Dr. Olesiuk, who I had the opportunity to cross-examine during the Cohen Commission knows a lot about Steller sea lions and unfortunately he's not on this panel but let's see where we can go.
16341. The AQ that I want to call up, Ms. Niro, is the one respecting marine mammals. I think it's -- I have it as the third one that I listed.
16342. Thank you.
16343. So this is a Science response to Information Requests submitted to the Enbridge Pipeline Project Environmental Impact Assessment Hearings Respecting Marine Mammals and I note that you were one of the co-contributors to this, Dr. Ford; were you not?
16344. **DR. JOHN FORD:** Yes, I was.
16345. **MR. LEADEM:** You seemed a little bit puzzled. I think we'll get down to it.
16346. There's some mention made of killer whales in there, and I think you probably were the killer whale expert for that portion of it.
16347. So I want to turn to the analysis and responses on page 6 of this document. And once again, before we get into the actual wording, this was the Science advice that was received by DFO which informed the actual evidence that was filed on behalf of Department of Fisheries and Oceans in these proceedings, was it not, Mr. Antcliffe?
16348. **MS. BONNIE ANTCLIFFE:** Yes, that's correct.
16349. **MR. LEADEM:** And in this case, I note for the record that there's a simple -- just excerpting this entire passage and it's found at page 77 of E9-21-06 -- I just say that for the record. I'm not asking for any clarification or confirmation of that at this stage.

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16350. So with respect to the analysis and responses -- and I know that it's quite lengthy there -- the question is: Is there anything today that you would change about that analysis and responses, anybody on the panel from DFO?
16351. **DR. JOHN FORD:** Are you referring to the first paragraph?
16352. **MR. LEADEM:** Yeah, let's deal with -- it's very lengthy, so let's deal with it paragraph by paragraph.
16353. I just want to make sure there's no changes to the evidence.
16354. **DR. JOHN FORD:** I don't believe there's significant changes.
16355. **MR. LEADEM:** And if we go down to the next one about the environmental effects of petroleum spills to sea otters, harbour porpoise and other marine mammals?
16356. **DR. JOHN FORD:** So that simply refers to -- describes what the Proponent had stated.
16357. **MR. LEADEM:** Right.
16358. **DR. JOHN FORD:** Yeah.
16359. **MR. LEADEM:** And if we can now scroll down to the third paragraph down, the one beginning "Scientific publications based on term studies of killer whales and sea otters in Prince William Sound."
16360. **DR. JOHN FORD:** Yes, that's correct.
16361. **MR. LEADEM:** So that's still confirmed today.
16362. And finally, the last paragraph, "Using five years of annual population census data prior to EVOS". And that's still the case?
16363. Continuing on to page 7?
16364. **DR. JOHN FORD:** Yes, there -- there is -- there's new information that has come forward since this was prepared; but, generally, it's correct.

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16365. **MR. LEADEM:** What's the new information?
16366. **DR. JOHN FORD:** Specifically about killer whales, there's been a review article published in -- about two months ago, I believe, that is relevant to the discussion of the impacts of the Exxon Valdez oil spill on the killer whales in that area.
16367. **MR. LEADEM:** And are you aware of the -- what conclusions it draws or any hypothesis it answers?
16368. **DR. JOHN FORD:** I am. It proposes -- this is a recent paper.
16369. **MR. LEADEM:** This is Dr. Matkins' work?
16370. **DR. JOHN FORD:** No, Dr. Matkins' work is cited in this in a -- from a journal publication 2008. This is a more recent publication ---
16371. **MR. LEADEM:** Okay.
16372. **DR. JOHN FORD:** --- two thousand thirteen (2013) by Mr. Fraker.
16373. **MR. LEADEM:** Sorry; I interrupted you. You were going to tell me what it said.
16374. **DR. JOHN FORD:** Well, it -- there's -- Mr. Matkins' paper of 2008 describes the mortalities that took place surrounding -- at the time of or shortly thereafter the oil spill in Prince Williams Sound and documented the ongoing mortalities that took place in a particular resident pod that was in the area, you know, seen in -- around the time of the spill or shortly thereafter.
16375. The more recent publication raises questions regarding the linkage to the spill and the possibility that some of these mortalities may be -- may have been attributable to bullet wounds that would be residual from a period of the animals being shot at by fishermen in the area prior to the oil spill because of depredation of sable fish from fishing lines.
16376. And so there was a period when the whales were -- when there was various kinds of efforts being made by local fishermen to dissuade the animals from removing the fish and then, in some cases, they reverted to gunshot attempt and some animals were found to have died of shooting prior to the spill.

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16377. **MR. LEADEM:** Thank you for that.
16378. Now, in terms of the sea otters -- and if you don't feel that you're competent to answer this, Dr. Ford, please bear with me.
16379. But is it the case that the sea otters are expected to actually arrive at the -- within the confines of the CEAA?
16380. **DR. JOHN FORD:** It's difficult to predict the rate at which the sea otter population may expand into the area.
16381. They can make sudden jumps in distribution and -- rather than it being a steady progression, but the general trend is for the sea otter population to be expanding in British Columbia quite strongly and the expansion both in population abundance and in distribution is occurring in this area.
16382. And currently, they have reoccupied former habitat as far up as the -- about halfway up the outer shore or offshore reefs off Aristazabal Island.
16383. And so there have been sightings of lone individuals -- scouts, perhaps -- in the area of the CCAA, but what would qualify as continual re-colonization has not progressed quite to that far -- to that extent.
16384. But because it's -- the whole area is highly desirable habitat and was occupied prior to the depletion by the fur traders back in the 18th and 19th centuries, we can expect the population to reoccupy that area in the next few years.
16385. **MR. LEADEM:** DFO is engaged in sea otter research; is it not?
16386. **DR. JOHN FORD:** It is.
16387. **MR. LEADEM:** And who is the lead on that?
16388. **DR. JOHN FORD:** Linda Nichol is the sea otter biologist.
16389. **MR. LEADEM:** And she's been engaged in assessing population growth and range of sea otters.

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16390. Is that right?
16391. **DR. JOHN FORD:** That's correct.
16392. **MR. LEADEM:** So the information that you've just related to me is more likely --probably came from her and your discussions with her?
16393. **DR. JOHN FORD:** Indeed, yes.
16394. We work very closely on these sort of joint projects, but she's the lead on the sea otter work.
16395. **MR. LEADEM:** And similarly with respect to stellar sea lions, you would have had conversations with Dr. Alesiuk with respect to their distribution and abundance within the area that may be impacted by the project?
16396. **DR. JOHN FORD:** That's correct.
16397. And I'm familiar with some of the reports that have recent -- that Mr. Alesiuk's recently published on the distribution status of sea lions.
16398. **MR. LEADEM:** Okay.
16399. So if I turn, then, to the "Conclusions", the first one is:
- "Without detailed and updated information on stellar sea lion distribution, DFO Science is not able to assess potential impacts to the species." (As read)*
16400. That's still the case today?
16401. **DR. JOHN FORD:** It needs to be, I think, qualified, that statement, in that we do have very good information on the locations of traditional breeding rookeries and year-round haul-out sites and winter haul-out sites for stellar sea lions.
16402. The population has been expanding over the last several decades and has probably surpassed historical levels. But as it has expanded, new sites have become occupied. In particular, one breeding rookery is now a significant one near Haida Gwaii that didn't exist even 10 years ago.

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16403. What I believe this statement is referring to is the actual distribution of the animals when they're not on their haul-out site. So how they use -- what areas they use for foraging, moving between winter and summer breeding locations, these kinds of things need to be better understood.

16404. **MR. LEADEM:** I see.

16405. Are we in a position to determine whether or not Steller sea lions, for example, use any of the CCAA?

16406. **DR. JOHN FORD:** But we know they do use the CCAA in terms of their -- them being seen swimming in the areas.

16407. They don't specifically have any significant haul-outs. The nearest one is near Ashdown Island in Caamano Sound, which is, I believe, right outside the boundary of the CCAA.

--- (A short pause/Courte pause)

16408. **MR. LEADEM:** If we can go back now to the AQ6, the one by Clarke and Jamieson, please? And now, go to Map 6?

16409. So this is the -- we're back again to Clarke and Jamieson, Dr. Ford, and this is the map "Important Areas Identified for Northern Resident Killer Whales in PNCIMA".

16410. And once again, I'm going to use the laser pointer here and circle an area in red that appears to me to be Caamano Sound, Caamano Island, Gil Island, a little bit distance, but not all the way up Kitimat Arm, but some ways up to Douglas Channel.

16411. You'd agree with me that I've accurately described the rough geographic area of the central portion of that map?

16412. **DR. JOHN FORD:** Yes.

16413. **MR. LEADEM:** And would you still classify that today as a high -- of high importance to Northern Resident Killer Whale?

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16414. **DR. JOHN FORD:** Yes, this -- with some potentially minor tweaking of boundaries.
16415. But, essentially, this pattern here -- I think we've identified -- again, this was prepared with data up to 2005 or so, I believe, or 2006 and I think for that area, yes, we can certainly -- we have even more information that describes the importance of that area today.
16416. **MR. LEADEM:** Yes.
16417. So would you -- when you say "minor tweaking", would you expand it, contract that area, or how would you modify it today with your knowledge?
16418. **DR. JOHN FORD:** I wouldn't modify that particular area. I was actually referring to another one there but ---
16419. **MR. LEADEM:** Okay.
16420. **DR. JOHN FORD:** --- yeah.
16421. **MR. LEADEM:** So that area in the centre that we focused upon in the CCAA would basically stay the same today?
16422. **DR. JOHN FORD:** Yes.
16423. **MR. LEADEM:** I wonder if we can go to Map 39, please? It's the last map in that section that I ...
16424. I'm not sure who's going to be able to answer the query I have about this. The map is entitled "Important Areas Identified for Parks Canada and PNCIMA" and then, if we can scroll down to the "Legend", there's an area in pink. It's "Parks Canada IA".
16425. I would take it IA refers to "Important Area"? Is that generally the nomenclature that was used, Dr. Boyd or Mr. Morgan, or Dr. Ford?
16426. "IA", what would that stand for?
16427. **DR. SEAN BOYD:** Sorry, we don't know.

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16428. **MR. LEADEM:** Okay.
16429. **MS. JENNIFER WILSON:** I can jump in there. “IA” typically refers to “Important Area”.
16430. **MR. LEADEM:** All right, so “IA” would refer to “Important Area”.
16431. So for some reason -- and I’m going to have to rely upon Dr. Ford, Mr. Morgan or Dr. Boyd -- Parks Canada seemed to take a look at some of these areas in pink and depict them as important areas for their purposes.
16432. Are any of you who participated in this Delphic process able to shed any light on this?
16433. **THE CHAIRPERSON:** If I could just ask the witnesses who are seated in the second and third rows, it’s difficult to be able to see all the name cards for all of us, so if you are speaking, would you mind just identifying yourself at least for now when you speak so that we can make sure that your remarks are attributed to you correctly?
16434. **MS. ANDERSON:** Madam Chair, before the witnesses answer, I’m just questioning a little bit the relevance of the Parks Canada information to the issues before the Panel.
16435. I’m just wondering if perhaps my friend could refer us back to the evidence filed by the Government participants. I don’t think this is part of our filed evidence.
16436. **MR. LEADEM:** It’s not, Madam Chair, but if I could be allowed just to ask the question just to find out if this Panel has any information about Parks Canada’s interest in this area?
16437. **THE CHAIRPERSON:** Ms. Anderson, any further comments?
16438. **MS. ANDERSON:** Just that these Government participants don’t speak on behalf of Parks Canada and Parks did not register as a Government participant.
16439. So any information that they may have would not be on behalf of Parks Canada.

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--- (A short pause/Courte pause)

16440. **THE CHAIRPERSON:** Mr. Leadem, we don't want to stray off topic too far to what we have. We have plenty on the file to think about already. So let's see on a very preliminary basis if there's any information and then, if not, let's move on.

16441. **MR. LEADEM:** Well, my question is going to be very direct and it's going to be directed to the Delphic participants, Dr. Ford, Dr. Boyd and Mr. Morgan who have already indicated they participated in the process that led to these maps and, if they have knowledge of it, then I'd like to find that out.

16442. So my questions for each of you three gentlemen are: The area that I'm now circling with the red laser seems to be the area encompassed by the CCAA and seems to be Gil Island and Caamano Inlet and Douglas Channel and, for some reason, Parks Canada has depicted that area as an important area.

16443. When you participated in the Delphic process and discussed these areas, do you have any knowledge of why Parks Canada depicted this particular area as an important area?

16444. **DR. JOHN FORD:** I'm afraid I don't.

16445. I didn't have any role in interacting with Parks Canada in preparation of that map, but they may have used the maps that were provided on the various different taxon groups to prepare that.

16446. But I don't know.

16447. **MR. LEADEM:** All right, thank you, Dr. Ford.

16448. Back in the row, Mr. Morgan or Dr. Boyd, were you privy to any discussions with Parks Canada that would shed some light on why Parks Canada determined that an important area was an area that I've just circled with the red laser?

16449. **DR. SEAN BOYD:** This is Sean Boyd.

16450. No, we weren't participant to that, so we did not discuss anything with

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Parks Canada in that light.

16451. **MR. LEADEM:** Okay.

16452. And Mr. Morgan?

16453. **MR. KEN MORGAN:** I would say exactly the same thing.

16454. We looked at it only in terms of marine birds and in terms of the EBSA process. So we weren't in consult with Parks Canada.

16455. **MR. LEADEM:** All right. I'll have to take my answers accordingly.

--- (A short pause/Courte pause)

16456. **MR. LEADEM:** I'm going to talk about some of the uncertainties that still remain as a result of this Panel's review of the evidence and these will be general questions so if anyone on the Panel wants to speak up, by all means, please do so. And I don't want to ignore the people on the phone who have sat patiently by as well.

16457. Do we know to Canada's satisfaction the geographic distribution, for example, for the humpback whales or for some of the cetaceans sufficiently that we will be able to determine how they may be impacted by this Project should it proceed?

--- (A short pause/Courte pause)

16458. **DR. JOHN FORD:** Just so I understand the question, you're asking specifically do we know enough about the distribution ---

16459. **MR. LEADEM:** The geographic distribution, the spatial distribution of these species to be able to determine what potential impact would occur should this project proceed.

16460. **DR. JOHN FORD:** That question could be answered at different levels of resolution. I think generally we have, for example with humpback whales, a fairly good understanding of areas off our coast that are included in the Proponent's area. We have a fairly good idea of what areas are important for the animals feeding, which is why they use our waters primarily.

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16461. But at a fine scale, I do not think we have enough information on the spatial distribution in the context of risk of ship strike, for example, which in order to better appreciate and assess the potential risk in that area, we need very high resolution information at a scale of a few kilometres or less even, in terms of -- in the confined channel area, where the animals are with respect to the shipping corridor.

16462. So this is one of the main reasons we have not been able to -- be able to accurately predict what ship strike risk may exist for humpback whales, fin whales and so on because of a lack of high resolution spatial information for that area.

16463. **MR. LEADEM:** What about marine mammals generally; are we in the same predicament of uncertainty; we just don't know?

16464. **DR. JOHN FORD:** In terms, again, of their spatial distribution, I think it varies by different species of marine mammals. We know certainly much more about some species than others and so we would be able to, I think, make better predictions about impacts, for example, for northern resident killer whales than we can for some other species, for example.

16465. But -- so I think to some extent, one could say that in the open water area, in particular, we could benefit from having better information on the seasonal distribution of virtually all marine mammals, because again, they're difficult animals to study. We know much more about where they are and what they're doing during the summer months when we can get out and actually see the animals in the field. We have a lot of uncertainty about movement patterns and habitat use during the late fall through the early spring period, for example.

16466. So in that sense, I think we could certainly benefit by much better information.

16467. **MR. LEADEM:** Switching from mammals to fish, for marine fish, especially groundfish, are we in a position to know, based upon what we do know about the geographic distribution of groundfish, what effects are going to be visited upon groundfish as a result of this project, should it proceed? Are we uncertain or do we know?

16468. **MS. BONNIE ANTCLIFFE:** With respect to this one, our evidence

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in our science paper says that there is uncertainty with respect to what the potential effects could be.

16469. **MR. LEADEM:** Right. And what about anadromous fish; what about our salmon? I'm thinking in terms of some of the salmon that move through these waters on their migration out to sea as the smolts move up to the Gulf of Alaska to feed. Do we know enough about the geographic distribution of our anadromous fish, the sockeye salmon, the chinook, the coho, the pink salmon, to be able to draw some conclusions about the effect upon these species of this particular project or are we uncertain?

16470. **MR. BRAD FANOS:** I think there's always uncertainty in terms of the spatial distributions of the various species. But in terms of the nature of the project and the impacts on the marine environment, there are commonly understood practices with commonly understood mitigations that are being applied.

16471. So from that perspective, there's always the benefit of additional information for spatial distributions but the nature of the impacts are well understood and the mitigations that are applied are well understood.

16472. **MR. LEADEM:** So are you telling me, Mr. Fanos, that you can show me a map and show where the migratory pathway lies for the Fraser River sockeye salmon as they migrate up the coast? Can you do that with any degree of specificity?

16473. **MR. BRAD FANOS:** No, and that was I think my point -- is that there's always a benefit of better information in terms of understanding spatial distributions.

16474. **MR. LEADEM:** Yes.

16475. **MR. BRAD FANOS:** But in terms of the interactions with the species and the fish, we've looked at many projects that have construction in the marine environment and have confidence in terms of the types of mitigations and the time and windows that are applied to look at lessening those impacts and avoiding those impacts.

16476. **MR. LEADEM:** Does that include the risk from an oil spill or are you hiving that off, are you simply looking at the project from the aspect of

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- construction?
16477. **MR. BRAD FANOS:** Our primary evidence was around the construction and operation.
16478. **MR. LEADEM:** Yes. What about waterfowl -- I'm going to go to the back row now and call upon Dr. Boyd and Mr. Morgan and -- I tried to keep notes of -- Dr. Esler, I think you might have something to do with marine birds as well.
16479. Do we know enough about the geographic distribution of pelagic species of birds, of marine birds, of waterfowl, migratory birds to enable us to estimate the real risks of this project should it proceed?
16480. **DR. SEAN BOYD:** Okay, well, I'll start. Sean Boyd.
16481. I would say we have something in the order of 120 to 130 different species of marine birds using the B.C. coast, so that's a pretty big package.
16482. I'll let Ken Morgan talk about the pelagic birds here in a second. But as far as some of the species of near shore birds like sea ducks, loons and grebes, we have a pretty good idea of distribution of these species along the coast, but we have very little information -- detailed information and data on the abundance and distribution patterns of these birds. And that's not just to say for one season; we have four seasons that we're looking at here; breeding season, wintering season and two migrations.
16483. As far as determining the impact of the project, I would say no, we don't have enough information, that's for sure. And that's why we are going to need some more information, some more detailed baseline surveys. That's as far as the near shore birds go. I'll let Ken maybe talk a little bit about the pelagic birds.
16484. **MR. KEN MORGAN:** I'd like to say that the data that we've been collecting have been collected by ships of opportunity, primarily Coast Guard, DFO vessels. So we don't have good spatial coverage in terms of all areas being covered, all seasons being covered. So we're victims of wherever the ship is going, that we don't have a say in where it goes.
16485. From where we have gone and collected data, we have fairly good information with regards to relative abundance and seasonality. But we would

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- not be able to on a bird-by-bird basis trace its migratory pathway into Canadian waters, but we do have some knowledge in terms of what I would refer to as hot spots, concentrations of some of these birds.
16486. In terms of the specific question about predicting the impact, I would agree with Dr. Boyd, that we don't have that resolution -- spatial and temporal resolution for that. Thank you.
16487. **MR. LEADEM:** Thank you, Mr. Morgan.
16488. Dr. Esler, did you want to say anything?
16489. **DR. DAN ESLER:** No, I have nothing to add to that.
16490. **MR. LEADEM:** Okay.
16491. Ms. deShield, you're itching to talk?
16492. **MS. CORAL deSHIELD:** I could say a couple of things. In our written evidence -- it's Coral deShield.
16493. In our written evidence we focused more on the potential impacts related to a potential spill. And in that regard we did say that there was the potential for significance in the event of a spill.
16494. At the time, we didn't say that there was more information needed to inform that decision because we recognized that there are some gaps but -- and we know that the values, that bird values are high. Knowing more details wouldn't be -- necessarily change that conclusion that there is the potential for significance in the event of a spill.
16495. We did place emphasis however though on the need for further baseline monitoring and so that's where we have made some recommendations.
16496. **MR. LEADEM:** I don't know if we lost somebody or somebody wants to say something, Madam Chair.
16497. **THE CHAIRPERSON:** I'm not sure either. We had -- that's two of those that we've had. So I don't know -- so if we lost someone and then they joined back in.

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16498. Ms. Anderson, do you want to -- to just check which of your witnesses are on the line at this point?

16499. **MS. ANDERSON:** Sure. Could I just check, Richard Holt, are you still there?

16500. **MR. RICHARD HOLT:** Yeah, I'm here. I think there was something that happened in the room and I got cut off but just reconnected.

16501. **MS. ANDERSON:** Oh, okay. That's good. Thank you.

16502. **THE CHAIRPERSON:** And while we're doing that just to confirm, Dr. Zhang, are you still on the line?

16503. **DR. XUEBIN ZHANG:** Yes I'm on the line.

16504. **THE CHAIRPERSON:** And Dr. Brown?

16505. **DR. CARL BROWN:** Yes I'm on the line. Thank you.

16506. **THE CHAIRPERSON:** Thank you very much.

16507. **MR. LEADEM:** So I thank you for your answer, Ms. deShield, because it answers a couple of things in my mind.

16508. Obviously in the event that there were an oil spill, which none of us in this room want to see happen, but it would have significant and adverse consequences to the environment there's no doubt about that.

16509. **MS. CORAL deSHIELD:** Was that a question?

16510. **MR. LEADEM:** Yes.

--- (Laughter/Rires)

16511. **MR. LEADEM:** I can see all these -- I realize my voice should have gone up as if I were asking a question, Madam Chair. That's my problem.

16512. **MS. CORAL deSHIELD:** There is the potential for significant

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- effects. Of course it depends very much on the details.
16513. **MR. LEADEM:** Yes, it depends on the -- on the type of spill and the duration of the spill and how much is spilled and what time of year, where, and all these other variables.
16514. But essentially, if we're looking at this project with the possibility of an oil spill that's something that would have potential consequences upon the environment, there's no doubt about that is there?
16515. **MS. CORAL deSHIELD:** I agree.
16516. **MR. LEADEM:** In the face of uncertainty when science is uncertain isn't it the case -- and the scientists and the management people alike I turn to you, maybe Dr. Caza or Ms. Antcliffe you can answer this question better, isn't it the case when the science is uncertain that we -- we apply a precautionary approach to determining how to proceed under any situations such as the one that we're faced with today with this particular project?
16517. **MS. BONNIE ANTCLIFFE:** With respect to the scientific uncertainty, it is common within the government to look at a precautionary approach to decision-making.
16518. **MR. LEADEM:** Right. And that would mean the application of the precautionary principle the Rio Declaration that I'm sure most of you are familiar with; correct?
16519. Dr. Caza, you seem to be nodding your head. I don't mean to single you out but -- but I look to you as a centre person on the panel.
16520. **DR. CAROLINE CAZA:** Well, that's just a geographic coincidence.
16521. The -- I believe the precautionary principle is something that we use to try to inform a lot of the work that we do. And I believe the Proponent has even referred to it in some of their documents as informing their own thinking.
16522. **MR. LEADEM:** Yes.
16523. **DR. CAROLINE CAZA:** Many of the recommendations that we've made in our evidence, I think, speak to how we see the precautionary principle

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- applying to this project. So the recommendations for example to gather additional baseline monitoring information, follow-up monitoring, and those types of recommendations are, I think, very germane to -- to how a precautionary approach could be applied to this project.
16524. **MR. LEADEM:** And after gathering all the baseline data information which I think we can all agree needs to be done, if there's still uncertainty about what effect this project may have upon the environment and you want to apply this precautionary approach, what, if anything, can you do at that stage after you've gotten all the information that you need?
16525. Is it the fact that you analyze on the step-by-step basis the mitigative measures that the Proponent is putting forward and make a determination if those mitigative measures are sufficient in and of themselves or is it something more?
16526. **DR. CAROLINE CAZA:** I think that brings into -- into play another concept that we talk a lot about when we try to look at projects where there is inherent uncertainty, and that is the idea of adaptive management, an adaptive management approach which says that I think in this context gathering the information is not the end -- is not the end point.
16527. The end point is the application of that information and the learning from that into a continual examination of whether things are being done as well as they can. And I think, again, our recommendations point towards taking that kind of an approach where there is uncertainty.
16528. **MR. LEADEM:** Is it the case then -- are you telling me basically build it and then the adaptive management will -- will come into play in terms of how the project can proceed and not have a -- an effect upon the environment or are we to take the lens of knowing what we know now and apply it before we actually let the project proceed?
16529. Do you see the differences the nuance will -- the difference in nuance there?
16530. **DR. CAROLINE CAZA:** Well, in this context I would just point out that -- that we are not making the decisions ---
16531. **MR. LEADEM:** Yes I understand that.

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16532. **DR. CAROLINE CAZA:** --- about the project.
16533. **MR. LEADEM:** I understand that.
16534. **DR. CAROLINE CAZA:** And I think in the context of -- for Environment Canada and the other departments may have others to contribute, we're trying to understand and make recommendations about how additional information could be useful on an ongoing basis in ensuring that should the project be approved the way in which it's implemented and the way in which we utilize that information is designed on an ongoing basis to mitigate the -- any potential effects.
16535. So I think that I would restrict my -- my comments about how adaptive management might apply, how we're doing this to -- the way in which we are trying to formulate our recommendations and think about -- about the project. But that is very different that -- that is within that context.
16536. **MR. LEADEM:** Yes. And I thank you for that, Dr. Caza. I fully appreciate that none of you on the panel are in the business of providing the answers in terms of should the project proceed or not, that's not your role. I fully appreciate that.
16537. But having said that, you're all civil servants, you all serve the people of Canada and you have obligations, do you not? To make sure that the little bailiwick underneath your area is protected and I think the people of Canada look to you for that.
16538. Do I have that right or am I just being too pie-in-the sky about all of this?
16539. **MS. ANDERSON:** Madam Chair, I think that the government participant's evidence all speaks to the department's various mandates and I think that might be what my friend is referring to in terms of their responsibilities.
16540. So perhaps it might be helpful if the question were rephrased in a less confrontational manner.
16541. **MR. LEADEM:** I fully apologize if I meant to be confrontational. I'm just trying to arrive at some information.

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16542. The information I'm trying to arrive at is, is can the people of Canada rely upon you to protect the environment, to protect the fishery values, to protect the whales, to protect the seabirds?
16543. **MS. BONNIE ANTCLIFFE:** It's Bonnie Antcliffe here from DFO.
16544. In terms of this conversation it would be helpful for us to focus on two components; one would be the impacts to the environment in terms of the construction and operation of the project, and the second would be spills which are unplanned.
16545. With respect to the construction and operation of the project and the potential environmental effects resulting from that, our evidence does suggest there is uncertainty. But our evidence provides views with respect to how that uncertainty can be managed. It could be managed through research, monitoring, adaptive management, mitigation and offsetting.
16546. With respect to spills as -- this conversation is hard to follow because spills are unplanned for. So with respect to the uncertainty that you raise around the impacts from spills, I believe Panel 2 will talk about spill prevention. And some of our evidence speaks to environmental effects and spills, but the overall question of uncertainty for us looking at the construction and operation impacts from this project, we believe the uncertainty can be addressed through the approaches we talked about, through the research, through the adaptive management, through the monitoring and through the mitigation.
16547. **MR. LEADEM:** Thank you for that, Ms. Antcliffe.
16548. If the research and the baseline studies and all of that work does not remove the uncertainty, I guess my question is, what then? Do you simply move forward on an adaptive management basis?
16549. **MS. BONNIE ANTCLIFFE:** That is our understanding of the purpose of this environmental assessment, is to make that determination.
16550. **MR. LEADEM:** Right.
16551. **MS. BONNIE ANTCLIFFE:** Do we have a means to look at measures and mitigation and additional measures and bring those into play? We have a mechanism through species at risk and the marine mammal program and

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- regulations to look at mitigation measures as required, to adjust and set as we go to avoid impacts.
16552. **MR. LEADEM:** Does Environment Canada have any response to the more general question I asked?
16553. **DR. CAROLINE CAZA:** I think you're asking whether or not there's a basis for proceeding in the -- in the presence of uncertainty and I think my DFO colleague has addressed that by saying that, really, in the context of this project, that is part of the larger decision-making around the environmental assessment.
16554. I think all of us recognize that all decisions we take have some element of uncertainty and this is a process designed to try to understand where are the greatest uncertainties and -- and how can they best be managed moving forward and, based on that, what -- what kinds of decisions need to be made. I -- I don't think there is much else that can be said about that.
16555. **MR. LEADEM:** And isn't it best to proceed in that uncertainty with some precaution -- with that cautionary note of proceeding slowly and making sure that you're not going to do something that might potentially have a devastating effect upon the environment? Isn't that the case?
16556. **MS. ANDERSON:** Madam Chair, I'm struggling a little bit again with the relevance of this questioning to the evidence filed by the government participants.
16557. I think it might be helpful once again if my friend could just refer them to some of their filed evidence that may be relevant to this issue. I think perhaps his questions relate to the broader decision-making that's to be done by the Joint Review Panel in which case our -- the government participants wouldn't have anything to say about that.
16558. **MR. LEADEM:** No, Madam Chair, I made it quite clear that I fully appreciate the members of this panel, the witness panel have no decision-making authority, but there are questions of interest to my clients in terms of how the process unfolds and the continuing role of Canada's civil servants in that process.
16559. These are all Canada's civil servants who have taken an interest, not just an interest in the project, but have actually examined the project in great

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- lengths and great details, and have provided written evidence, fair enough.
16560. But I think the questions are more designed to satisfy my client's concern that someone should be at the wheel going forward on behalf of Canada and I'm looking to see whether it's these people that are seated across from me that are going to be helpful in the exchange. That's the purpose of the questions.
16561. **MS. ANDERSON:** I'm wondering, perhaps then, if the questions would be a little bit easier for the witnesses to answer if they were -- I think what my friend is saying that they have to do with what would the department's role be post-project approval if it were to be approved.
16562. I'm just -- I'm still having a little bit of trouble understanding, but perhaps my friend could clarify on that point.
16563. **MR. LEADEM:** Madam Chair, with all respect, I think the questions are simple enough. I'm simply trying to understand from the perspective of these good civil servants, not just what their role is, but what their advice might be in the event that uncertainty still is at the end of the tunnel or at the end of the pipeline, what is going to transpire should this project proceed. I want to understand that.
16564. It's not just a question of their roles and respective roles in all of this process. It's also a question of how they would be providing advice because some of these members are scientists and they provide advice to management in making decisions in moving forward, and I'm simply trying to probe and to question their evidence with respect to that.
16565. **THE CHAIRPERSON:** Do the witnesses have further information to add based on Mr. Leadem's question than has already been provided?
16566. **MS. BONNIE ANTCLIFFE:** For DFO, I can -- I can summarize what we said which I think could be helpful here.
16567. So again, with respect to the construction and operation of the project and the potential environmental effects resulting from that project, there is uncertainty. **Our evidence suggests that, notes that, however we believe that the risk can be managed. We believe that the risk can be managed through research, monitoring, mitigation, additional mitigation and offsetting.**

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16568. Separating out the issue of spills, our data has suggested there's some uncertainty there. **Spills are not planned for.** With respect to the significance of a spill at this point, it's hard to provide definitive statements with respect to the environmental effects because it would depend on the products, the behaviour, the amount of spill, location, measures, application of dispersants or other components.
16569. **DR. CAROLINE CAZA:** From an Environment Canada perspective, we've identified in the recommendations we've made where we see the greatest uncertainties with this project, and we've made recommendations for additional information and we have tried to articulate why that information would be useful and important from our perspective in informing this project should it proceed. And furthermore, we've identified where we would be willing to participate in the process moving forward.
16570. So for example, we've talked about a scientific committee that we've recommended. We've talked about a baseline monitoring program and indicated that we would be prepared to work with the Proponent and others on those, and I think that's the way in which we see the department engaging in helping to address this issue going forward.
16571. **MR. LEADEM:** Thank you, thank you, witness. You've been more than patient with me, particularly those of you who I didn't ask questions of and I trust that you managed to follow the discussion without nodding off too much.
16572. Thank you, Madam Chair. Those are my questions.
16573. **THE CHAIRPERSON:** Thank you, Mr. Leadem.
16574. We'll call Mr. Cullen next. Mr. Cullen, are you on the phone?
16575. **MR. CULLEN:** I believe so. Can you hear me, Madam Chair?
16576. **THE CHAIRPERSON:** I can, Mr. Cullen, welcome.
16577. **MR. CULLEN:** Thank you so much. I so much wish I could be there in person. I thank you for the opportunity to do some questioning today.
16578. Should I just begin?

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16579. **THE CHAIRPERSON:** Please go ahead, Mr. Cullen.

--- EXAMINATION BY/INTERROGATOIRE PAR MR. CULLEN:

16580. **MR. CULLEN:** Thank you. Actually, my first question is actually for you, Madam Chair. I wanted to ensure before I got into one line of questioning that it was appropriate for this panel. We had some -- in preparation for this, some confusion over one particular topic and if I could beg your indulgence to ask with regards to your Panel Ruling Number 99. If I could just clarify one aspect of your ruling, that would help me greatly, is that appropriate?

16581. **THE CHAIRPERSON:** Mr. Cullen, why don't you proceed on your questions and we'll go on the basis of anything that arises as a result of that and if you need further clarification on a Panel ruling, I'd suggest that you talk to our staff.

16582. **MR. CULLEN:** Absolutely. So that will be the second component of my questioning today, so when we get there, if there's any confusion, then we can refer back.

16583. So I'd like to please call Exhibit E9-6-13, Government of Canada, Volume 2 Part 2, Adobe 21, page 16.

16584. **THE CHAIRPERSON:** Mr. Cullen, are you joining via WebEx or only on the telephone?

16585. **MR. CULLEN:** Here was another point. I am only by the telephone right now so if it's not inconvenient for you or your staff to indicate when the exhibits are up and that I may proceed?

16586. **THE CHAIRPERSON:** I will do that. The page is displayed now, Mr. Cullen.

16587. **MR. CULLEN:** I see. That wasn't a performance pause there. That was me just waiting. Thank you.

16588. A question -- I'm reading in this submission to the Panel that the -- and I'm quoting now:

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

16589. My question refers to the DFO is, with respect to this consultation process: What consultations with First Nations were undertaken under this prerogative?
16590. **THE CHAIRPERSON:** Mr. Cullen, the page that is displayed, I don’t believe we’re able to follow the wording that you’re reading and we’re on page 16.
16591. And let me just get the exhibit number that we’re on right now for you.
16592. We’re on E9-6-13. Was that the exhibit that you wanted to be on?
16593. **MR. CULLEN:** E9-6-13, correct.
16594. **THE CHAIRPERSON:** Okay.
16595. And we’re on page 16 and it starts, I think, with paragraph 47 and goes down to paragraph 48.
16596. Do you have a paragraph number?
16597. **MR. CULLEN:** I do not.
16598. May I just pause for one second just to relocate? I apologize, Chair. It’s difficult with not having the visual in front of me at the same time.
16599. **THE CHAIRPERSON:** Absolutely. Yes, we’ll work with it.
16600. **MS. TRACEY SANDGATHE:** Madam Chair?
16601. Pardon me. It’s Tracey Sandgathe here. I believe he’s on Adobe page

- 21, paragraph 71.
16602. **THE CHAIRPERSON:** Thank you very much for your assistance.
16603. As has always been the case with these hearings, everybody works together to get us to the right page ---
16604. **MR. CULLEN:** Thank you very much.
16605. **THE CHAIRPERSON:** --- so that the questions can be relevant. Thank you very much.
16606. So, Mr. Cullen, at least in terms of Adobe, we're on page 21 ---
16607. **MR. CULLEN:** That's right.
16608. **THE CHAIRPERSON:** --- and it's paragraph 71.
16609. **MR. CULLEN:** That's right.
16610. **THE CHAIRPERSON:** Okay.
16611. **MR. CULLEN:** So I don't believe I need to read that page -- paragraph 71 again so I'll just repeat the question which is: In its consultations with First Nations, can the Department inform us as to what consultations were undertaken with First Nations?
16612. **MR. MICHAEL ENGELSJORD:** Hi, Mr. Cullen. It's Mike Engelsjord with DFO.
16613. The consultation with First Nations is ongoing and, at the stage we're at right now, the consultation activities take place through these Panel proceedings. That's my understanding.
16614. Of course, if the project proceeds forward to a regulatory phase, DFO with respect to its regulatory approvals will ensure that any outstanding consultation obligations to First Nations will be completed before we make those regulatory decisions.
16615. **MR. CULLEN:** Thank you, Mr. Engelsjord.

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16616. Can you clarify one piece of what you just said in respect to they're ongoing through these Panel hearings?
16617. Can you just be more clear as to what that actually means?
16618. Are you meeting with various First Nations that are at the Panel hearings? Are you having side meetings?
16619. I'm trying to understand what that consultation actually looks like.
16620. **MR. MICHAEL ENGELSJORD:** No, right now, we're not meeting with First Nations or having side meetings.
16621. The consultation approach adopted by the Government of Canada for this phase -- the environmental assessment phase -- is to be done within the Joint Review Panel process.
16622. **MR. CULLEN:** So have there been any official consultation meetings between the Department and First Nations on this Project?
16623. **MR. MICHAEL ENGELSJORD:** Not specific to DFO.
16624. DFO and other departments participated in meetings with First Nations some time ago, before the Panel hearings got going.
16625. **MR. CULLEN:** Is it possible to provide a list of which communities were consulted with?
16626. **MR. MICHAEL ENGELSJORD:** I don't have that handy but I believe it was all of the ones that were identified.
16627. **MR. CULLEN:** I'm looking now ---
16628. **MR. MICHAEL ENGELSJORD:** If I could just -- sorry.
16629. **MR. CULLEN:** --- Sorry, go ahead Mr. Engels (sic).
16630. **MR. MICHAEL ENGELSJORD:** Could I just add one thing?

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16631. For that kind of information, you may get a more precise answer from Aboriginal Consultation Panel; Panel 4, I believe.
16632. **MR. CULLEN:** The -- but my understanding -- the Department has a history of primary contact consultation with First Nations and there are very specific directives and guidelines for federal officials to fulfill that duty.
16633. There are four recommended phases, according to the Federal Government. The first phase is a pre-consultation analysis and planning. Is the Department in that phase of First Nations consultation or not yet at that first phase?
16634. **MS. ANDERSON:** Madam Chair, perhaps I can be of assistance.
16635. Mr. Cullen, it's Dayna Anderson, counsel for the Government participants. Our Panel 4 is prepared to answer any questions with respect to the process for Aboriginal consultation that the government is employing on this Project.
16636. I'm not sure if these questions are meant to be process-related or not but, if they are, then I would suggest perhaps Panel 4 would be the best place to answer them.
16637. **MR. CULLEN:** Thank you very much for that.
16638. With respect to allotment decisions that get made from the Department of Fisheries and Oceans, very specifically now to the harvesting of commercial sought salmon, has there been any impact assessment towards the First Nations and their -- the obligations that the Department of Fisheries and Oceans has made in allocating fish to food fish ceremonial?
16639. **MR. MICHAEL ENGELSJORD:** Hi, it's Mike Engelsjord again.
16640. I would say not related to the -- this -- the review of this Project, no.
16641. **MR. CULLEN:** Okay.
16642. I want to talk about the fisheries' impact more broadly now.
16643. Have there been stakeholder meetings held to consult with the users of

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- the fishery and gain knowledge about potential impacts of spill on that fishery?
16644. **MR. MICHAEL ENGELSJORD:** Not to my knowledge.
16645. And just to go back a step, DFO and the other departments are participating in a whole of government approach to Aboriginal consultation for this Project. So DFO is not leading this it's a whole of government approach and we're not having side meetings with stakeholders or First Nations at this stage.
16646. **MR. CULLEN:** Okay, I appreciate that. I -- just to be -- I want to allow you to be clear so I'll try to be clear.
16647. With respect to -- I appreciate the whole of government approach. I would imagine in that whole of government approach, based upon on the relationships that the Department of Fisheries and Oceans has with the various stakeholder groups in the fishing community in the North that you are best placed to hold those consultations.
16648. I'm speaking specifically now of the commercial fishery, the sport and recreational fishery. I'll exclude First Nations because I understand that is a separate panel but, of those two main body groups, even in a whole of government approach, I would have assumed that the Department would be leading those stakeholder consultations.
16649. Have those been initiated?
16650. **MR. STEVEN GROVES:** Hi Mr. Cullen, it's Steven Groves here.
16651. No, those consultations have not begun.
16652. **MR. CULLEN:** Okay. Thank you very much Mr. Groves.
16653. And I'm wondering if there -- what guidelines does the DFO operate under, under a process like this?
16654. At what point must those stakeholder consultations come -- be initiated? Is there are a particular threshold moment that we cross?
16655. We talked about permitting earlier, I want to know if there's a Government directive at what point do you begin those conversations?

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16656. **MR. MICHAEL ENGELSJORD:** Hi, it's Mike Engelsjord again.
16657. Just to make sure we're clear on something. So DFO recognizes, because we have potentially regulatory approvals down the road if the Project proceeds, that that comes with a duty to consult to First Nations.
16658. But outside of that, there's not a consultation with other stakeholders like commercial or recreational fishers on our participation or, you know, in the review of the -- this Project.
16659. **MR. CULLEN:** Thank you, Mr. Engels (sic).
16660. So I want to be clear -- and forgive me for not knowing the inner workings of the Department -- that even beyond that phase of the issuance of permits, there is no obligation to consult with the other stakeholder groups -- the non-Aboriginal stakeholders groups.
16661. Is that -- did I understand you correctly?
16662. **MR. MICHAEL ENGELSJORD:** Yes.
16663. **MR. CULLEN:** Okay. I want to perhaps express some surprise then.
16664. When the Department of Fisheries and Oceans is making a decision with regards to in-season fishery management stock assessments, you use stakeholder advisory boards; do you not?
16665. **MS. BONNIE ANTCLIFFE:** Mr. Cullen, it's Bonnie Antcliffe here with Fisheries and Oceans.
16666. We do have a multi-stakeholder process called the Integrated Management -- sorry, the Integrated Fisheries Management Process which is the forum that we use for stakeholder consultation related to fisheries.
16667. **MR. CULLEN:** Thank you, Ms. Antcliffe.
16668. So my question is if those stakeholder panels -- the IFMP as one working example -- exist, why would not similar stakeholder groups be employed at this stage or future stages when considering the potential impacts of a pipeline

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and tanker proposal as we have in front of us?

16669. **MR. STEVEN GROVES:** It's Steven Groves here again.
16670. Yeah, we've got our integrated herring -- sorry, Integrated Harvest Planning Committee, which is our Salmon Planning Committee that we hold. It's made up of stakeholders and First Nations.
16671. But we -- you know, that process, as Bonnie indicated, is mainly for consultation on the salmon fisheries. It's more of an operational based planning committee.
16672. So certainly if there was some discussions about this project, you know, those might occur there, but that wouldn't be our official route that we would take consultations from stakeholders.
16673. **MR. CULLEN:** I appreciate that. And my suggestion isn't -- or my inquiry isn't that you would use that particular panel exclusively for these consultations.
16674. But in the DFO's attempt to understand potential impacts of the Proponent's project, was it ever contemplated to establish any similar or some version of a stakeholder group who have intimate knowledge, very historical knowledge of the fisheries, the ocean environment and the tributaries?
16675. **MR. MICHAEL ENGELSJORD:** It's Mike Engelsjord again.
16676. The answer to that is no. Our understanding is stakeholders and other members of the public's opportunity to provide their views on this project is through the process that we're in right now.
16677. **MR. CULLEN:** Thank you, Mr. Engelsjord.
16678. I would like to ask about modelling scenarios that the Department of Fisheries and Oceans considered for a potential spill in the marine environment.
16679. Were there any standard modelling scenarios that were applied either for the impacts on stock or on fish habitat?
16680. **MS. BONNIE ANTCLIFFE:** Mr. Cullen, it's Bonnie Antcliffe here.

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16681. Questions around that, we believe, at this point are best directed to Environment Canada.
16682. **MR. CULLEN:** Is Environment Canada able or willing to answer that question?
16683. **DR. ALI KHELIFA:** Hi. This is Ali Khelifa.
16684. Could you repeat the question please?
16685. **MR. CULLEN:** Absolutely, Mr. Khelifa.
16686. The question is did the -- I'll broaden it to say did the federal government, either yourselves or the Department of Fisheries and Oceans use any modelling to understand the impacts on the -- on the wild fish or fish habitat in the marine environment of an oil spill?
16687. **DR. ALI KHELIFA:** As far as Environment Canada is concerned, we don't have any impact assessment model. We do a trajectory and fate and behaviour modelling.
16688. **MR. CULLEN:** Can you help me define the difference between those two?
16689. **DR. ALI KHELIFA:** But in your first question you mentioned that you're interested about models that can be used for impact on fish. Is that correct?
16690. **MR. CULLEN:** I was asking both. I can distinct those questions apart to say what modelling was used to assess the potential impact on fish stocks of an oil spill in the marine environment, and we can then deal with habitat secondly, if you'd like.
16691. **THE CHAIRPERSON:** Dr. Khelifa, could I ask you to pull your microphone a little closer please? Thank you.
16692. **DR. ALI KHELIFA:** Yes.
16693. What I was trying to explain is that in order to do the impact, there are

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- two steps. The first one is to predict where the oil is going and what's happened to oil is the fate and behaviour side. And the second step is to superimpose this information with the spatial and temporal distribution of the resources.
16694. What I was talking about, Environment Canada does have the facility to address the first part, which is the fate and behaviour and trajectory. Does that answer your question?
16695. **MR. CULLEN:** I think it does.
16696. So just to be clear and to -- forgive me; I know very little about this field that is your expertise. This allows Environment Canada to understand the -- and try -- attempt to predict the behaviour of various products in the marine environment, where they distribute and how quickly they distribute, but not necessarily model the impacts upon a group like a wild salmon species?
16697. **DR. ALI KHELIFA:** That's correct.
16698. **MR. CULLEN:** Now, you've answered whether Environment Canada has done any modelling on -- let me finish that line just for a moment while I have you, sir.
16699. In modelling -- did you call -- I missed your first word, something and behaviour.
16700. **DR. ALI KHELIFA:** Fate and behaviour.
16701. **MR. CULLEN:** Thank you.
16702. On the fate and behaviour, do those models then suggest what environmental impacts could be had on the marine environment, but specifically on the fish habitat that is of some concern to us in the region?
16703. **DR. ALI KHELIFA:** I think there is a need to go back a bit here, try to explain further what this is about. There are two main questions that responders are interested about even to assess the impact. The first one is where the oil is going when the spill happens.
16704. And the second question is what happened to that oil. The first question is to address the trajectory question; the second is the fate and behaviour.

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16705. This information, as I said, it's used to assess the impact later on, assuming that we have a good knowledge about the spatial and temporal distribution of the resources.
16706. **MR. CULLEN:** Thank you. That's helpful.
16707. Just to finish off this point, has there been any modelling on what the potential impact would be on the areas that are of some sensitivity, the tributary areas and some of the areas of the marine coastal system that would be potentially impacted by an oil spill? I'm speaking specifically of the estuary systems up and down the North Coast?
16708. **DR. ALI KHELIFA:** You're asking if Environment Canada has done something like that? I don't recall that I have seen a study that was done in that perspective.
16709. **MR. CULLEN:** Thank you very much. Forgive me if I'm mixing terminology or using inappropriate terminology for what I'm attempting to understand.
16710. I would like to now make some inquiries about the ocean disposal permit under Section 36(4) of the *Fisheries Act*, which I believe is issued by Environment Canada. I'm not sure who can best speak to this question, but I would like to understand first what an ocean disposal permit allows the Proponent to do?
16711. **MS. LAURA MACLEAN:** Hello, it's Laura Maclean with Environment Canada.
16712. First of all, disposal at sea is regulated under the *Canadian Environmental Protection Act*, not the *Fisheries Act*, and it is administered by Environment Canada. You're correct.
16713. However, there is no need that's been determined to seek a disposal at sea permit in respect of this project.
16714. **MR. CULLEN:** Madam Chair, if I may just pause for one moment?
16715. **THE CHAIRPERSON:** Go ahead, Mr. Cullen.

16716. **MR. CULLEN:** Thank you.

--- (A short pause/Courte pause)

16717. **MR. CULLEN:** Thank you, Madam Chair.

16718. I'm going to spend a minute with an assistant that I have here pulling up the application, but I want to clarify something, Ms. Maclean, that you just said, that there hasn't been a request for an ocean disposal permit in the Proponent's application. Is that what you said?

16719. **MS. LAURA MACLEAN:** Yes, that's correct. Based on information provided by the Proponent in response to information requests that Environment Canada posed, we determined that there was no need for a permit for disposal-at-sea activities.

16720. **MR. CULLEN:** Okay. Thank you.

16721. Just allow me to clarify that point. I may have misunderstood you initially. Has the Proponent sought an ocean disposal permit and you felt that there was no need, or can you clarify just the terminology that we're using here so that we're on the same page?

16722. **MS. LAURA MACLEAN:** No, the Proponent has not sought a permit.

16723. What we did in the information request phase of the project was we posed questions to the Proponent to understand how the marine terminal would be constructed and whether the proposed construction methods would necessitate a permit application and we determined, based on the information provided, that that was not the case.

16724. **MR. CULLEN:** Okay. Thank you, Ms. Maclean.

16725. I understand from reading the Proponent's proposal that there is an intention from the Proponent to ask for one of these permits in the future. So just for my own, perhaps, edification at this point, can you just walk me through what an ocean disposal permit by the law as it stands allows the Proponent to do?

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16726. **THE CHAIRPERSON:** Mr. Cullen, could you point us in the evidence where you're seeing this statement, please?
16727. **MR. CULLEN:** Thank you very much. Just one moment, please.
- (A short pause/Courte pause)
16728. **MS. ANDERSON:** Madam Chair, perhaps I could be of some assistance.
16729. There is one paragraph in Environment Canada's written evidence, at paragraph 35, that speaks to disposal at sea. It's very brief and simply says that there's no need for such a permit at this time.
16730. **MR. CULLEN:** Thank you for that.
16731. I'm just looking at -- and I'm just getting it printed, so I'll read off the text as best I can. And I can return back to this, Madam Chair, if it still offers too much confusion.
16732. On page 42 -- excuse me, 4-2, Volume 7a, the "Construction Environment Projection -- Protection and Management Plan" as offered by the Proponent.
16733. I don't know if that helps Ms. Maclean out at all.
16734. **THE CHAIRPERSON:** Mr. Cullen, do you have an exhibit number, please, for that?
16735. **MR. CULLEN:** Allow me one moment, Madam Chair. I'm suspecting that we -- we may just circle back around to this line of questioning while we dig up that exhibit number, if that would help move the Panel along.
16736. **THE CHAIRPERSON:** Thank you, Mr. Cullen.
16737. **MR. CULLEN:** Thank you.
16738. The -- is it inappropriate for me, then, to ask for the definition of an "ocean disposal permit" until we clarify this point where it is in the actual Proponent's Application?

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16739. **THE CHAIRPERSON:** Mr. Cullen, we want to make sure that we're asking questions that are relevant to the Application at hand.

16740. **MR. CULLEN:** Thank you.

16741. **THE CHAIRPERSON:** Thank you.

16742. **MR. CULLEN:** So I would like to understand from the Department of Fisheries and Oceans now -- I wanted to get an essential question of research capacity up until this point.

16743. Is it possible for the Department to delineate the number of FTEs that have been put towards this application to this point in studying the impacts in preparing the Department's initial submission?

16744. **MS. ANDERSON:** I'm not -- I'm sorry, Madam Chair. It's Dayna Anderson.

16745. I'm not sure if I heard the question. The number of what?

16746. **MR. CULLEN:** Full-time equivalents.

16747. I want to understand what type of staffing resources have been put to the Project to this point in terms of preparing the submission from Department of Fisheries and Oceans and the research -- the field research that has contributed to that.

16748. **MS. ANDERSON:** Once again, Dayna Anderson, Mr. Cullen.

16749. I'm not sure that that's relevant to the information and evidence provided by the Department of Fisheries and Oceans.

16750. They've provided their evidence, and they're here to answer questions about it. But resourcing of the Government isn't relevant to the issues before the Panel.

16751. **MR. CULLEN:** My argument -- thank you, Ms. Anderson.

16752. My argument would allow for this, that we -- the Department in terms

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- of both the Application by the Proponent and the oversight that the Department would be needed to do over the next coming years is directly linked to the resources the Department has as its availability.
16753. We are currently -- there's been a little north of 1,000 positions cut at the Department in the last two years. The capacity of various departments to fulfil both their Constitutional and legal obligations is of direct consequence to the amount of staff they're able to devote, particularly on the science and monitoring side of their obligations.
16754. **THE CHAIRPERSON:** Ms. Anderson, did you have a comment?
16755. **MS. ANDERSON:** I'd just, again, point out that the Department has filed their evidence. They're here to speak to it.
16756. They're -- any commitments that they've made in there, they're willing to follow through on and so I'm not sure that these questions are relevant at all.
16757. I would note as well that they are outside of the Panel ruling number 99 with respect to what Mr. Cullen has been granted leave to ask.
16758. We haven't objected so far to the questions to Environment Canada because they were related to the evidence as filed, but we seem to be straying a little bit too far at this point.
16759. **THE CHAIRPERSON:** Mr. Cullen, the Panel would ask you to focus on the areas of questioning that you were approved for, which is to question DFO on the *Fisheries Act*, net loss, habitat protection and water crossings so far as they relate to the Federal Government evidence.
16760. So the Panel would ask you to move on to your next line of questioning because the Panel doesn't need the information about Government resourcing, nor have we authorized you to ask questions in that area.
16761. **MR. CULLEN:** Thank you, Madam Chair, and thank you to Ms. Anderson.
16762. A question on the capacity. We talked -- I have been permitted to talk about habitat and habitat restoration.

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16763. What modelling has gone into habitat restoration capacity, specifically to Department of Fisheries and Oceans?
16764. Has there been any modelling on the loss of habitat due to a spill and what recovery methods would look like specifically to fish habitat?
16765. **MR. MICHAEL ENGELSJORD:** It's Mike Engelsjord.
16766. The answer to that is: No, the -- determining or estimating or predicting the effects of the Project is the Proponent's responsibility.
16767. **MR. CULLEN:** So allow -- thank you, Mr. Engelsjord.
16768. Allow me to understand that, then.
16769. As you prepared your submission to the Panel, was it a consideration for the Department to prepare its own independent assessment of that Proponent's evidence or do some of your own primary research as well?
16770. **MR. MICHAEL ENGELSJORD:** Our review consisted of reviewing the Proponent's evidence.
16771. We did conduct some site visits -- like, our staff did conduct some site visits to areas of interest.
16772. **MR. CULLEN:** Can you list those for the Panel?
16773. **MR. MICHAEL ENGELSJORD:** No, I don't have a list of those.
16774. **MR. CULLEN:** Can that be provided?
16775. **THE CHAIRPERSON:** Mr. Cullen, it's Sheila Leggett again.
16776. Could you help the Panel understand the relevance of that undertaking, please, or that request?
16777. **MR. CULLEN:** Absolutely.
16778. If the Department, through -- I assume that if they identified a few key areas or areas of -- I'm trying not to load my question -- some concern in the

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general use of the term "concern", it would be helpful to understand which components of the Proponent's process they chose to go to the field and actually investigate.

16779. **MR. MICHAEL ENGELSJORD:** Maybe this -- what I can offer now is, I guess, the times when DFO staff went into the field to look at components of where the proposed project would be were sometimes site visits organized by the Proponent or at the request of the Proponent we attended when requested for some of these.
16780. And our staff had done some site visits to areas where we were interested in having a look with our own eyes.
16781. **MS. ANDERSON:** Madam Chair, just for clarification as well, I'm not sure if the question relates to the entire length of the pipeline route or if we're being specific to marine issues here.
16782. **MR. CULLEN:** Madam Chair, I would take either, or both.
16783. **MS. ANDERSON:** I think that the issue of the pipeline itself, those issues were canvassed in Prince George and we did have witnesses available at that time. But we're certainly prepared to answer questions with respect to the marine issues here.
16784. **MR. CULLEN:** So to be clear, Madam Chair, then, seeking where the Department of Fisheries and Oceans chose to go on site in the marine estuary environment, either with the Proponent or at their behest or of their own independent pursuit, that would be very helpful.
16785. **THE CHAIRPERSON:** Are the witnesses from DFO able to answer that question at this point?
16786. **MR. MICHAEL ENGELSJORD:** In terms of the marine component, I believe the only place that our staff may have visited would be the location of the terminal. That's the only location that would require regulatory approvals under the *Fisheries Act*.
16787. **MR. CULLEN:** Thank you very much.
16788. Madam Chair, this is just for reference for your clerks. As we seek out

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- the Adobe -- this returns back to an earlier question I had around the permitting. If I could offer you the section application, perhaps your staff could seek that out while we move on to other questioning. Would that be a good way to proceed?
16789. **THE CHAIRPERSON:** It's typical, Mr. Cullen, if you've got the exhibit number for us so that the staff can just go directly to it and pull it for you.
16790. What ---
16791. **MR. CULLEN:** Okay.
16792. **THE CHAIRPERSON:** What volume are you looking for, Mr. Cullen?
16793. **MR. CULLEN:** This is Volume 7a, "Construction, Environmental Protection and Management Plan", Section 4, Regulatory Overview, Table 4-1.
16794. **THE CHAIRPERSON:** Do you have an Adobe page number for that?
16795. **MR. CULLEN:** That's exactly what I'm looking for right now, and I'm struggling to pull one up. My apologies.
16796. Excuse me, we have Adobe page 19.
16797. **THE CHAIRPERSON:** Adobe page 19?
16798. **MR. CULLEN:** Yes, Ma'am. Excuse me, page 20.
16799. **THE CHAIRPERSON:** Mr. Cullen, why don't you continue with your questions; I know -- oh, and here it is. Ms. Niro is magic yet again.
16800. So we have Table 4-1 on the screen, "Potential Federal Permits, Conditions, Approvals and Notification Requirements".
16801. **MR. CULLEN:** Thank you very much. And thank you very much to your magical team there, Madam Chair.
16802. So about halfway down the page under the "Agency Environment Canada", the second Act or regulation that is referred to is the *Fisheries Act*,

Section 36.4, Issues, Ocean Disposal Permit.

16803. Am I misunderstanding something about this in the Proponent's application?
16804. **MS. LAURA MACLEAN:** Hello, Mr. Cullen, it's Laura Maclean again.
16805. So what you've alerted us to on the screen is actually the Proponent's application that was filed in 2010. The Proponent has, I think, made its best effort to match the -- what it thought might be a permitting requirement with the legislation but they have, in this instance, got it wrong. That would be under the *Canadian Environmental Protection Act* if it were required.
16806. But to get at your question, I think what we have here is a simple matter of sequencing. So the Proponent filed this application in 2010, we then had opportunities as the Government participants to pose information requests to the Proponent. And one of the requests, as I mentioned earlier, that Environment Canada posed was about this potential need for a disposal at sea permit. And I would add this is a fairly routine process in an EA is to exchange information about the specific activities that might be envisioned as part of construction.
16807. And then from the information that we received in response, we determined that a permit would not, in fact, be required. And so when we filed our written evidence in December of 2011, which I don't have the exhibit number handy, but you will see a conclusion that we drew in that written evidence that a permit would not be required.
16808. I hope that helps.
16809. **MR. CULLEN:** Yes, so I thank you very much for that clarification.
16810. So we're essentially talking about the construction process of the terminal; is that correct?
16811. **MS. LAURA MACLEAN:** Yes, that's correct.
16812. **MR. CULLEN:** So for the ongoing operation of the terminal and ongoing operation of the tankers, will any such permit be envisioned from your department?

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16813. **MS. LAURA MACLEAN:** Well, we can't anticipate the future, but based on the information provided to us at this point from the Proponent, no, we don't anticipate the need for a disposal at sea permit to be issued.
16814. **MR. CULLEN:** I thank you very much.
16815. Just a last, very small point. Disposal at sea permit is similar to the one I've been referring to, the oceans disposal permit? I just want to be clear.
16816. **MS. LAURA MACLEAN:** Yes, I think the colloquial term can be understood in either of the two phrases you've just used, yes.
16817. **MR. CULLEN:** Thank you. I appreciate that clarification.
16818. So I would like to return to the DFO's assessment. For some broad understanding of the DFO's current understanding of the Kitimat watershed, would the department suggest that it has a good understanding of both the species that are present and the timing that the species are present in the marine environment?
16819. **MR. MICHAEL ENGELSJORD:** Hello, it's Mike Engelsjord again.
16820. I think it would be fair to say the department, certainly when it comes to salmon species, has an understanding of the species there, their timing and use of the Kitimat watershed, yes.
16821. **MR. CULLEN:** Let's expand for a moment beyond salmon. For other, both critical and non-critical species for the local population, what is the understanding? What do you consider -- like you delineated out salmon. Let's talk about herring and some of the other populations that inhabit that particular area and spawn.
16822. **MR. STEVEN GROVES:** Hello, Mr. Cullen. It's Steven Groves here again.
16823. I think generally we have an idea about -- if you're specifically asking about herring. And it -- especially when certain stages of their life, we have -- we know that they would be present in the area. But certainly when it becomes to adults that are feeding and migrating, that's when it would become less certain in

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- my mind about where exactly those adults would be located.
16824. **MR. CULLEN:** Thank you very much.
16825. And comparing the department's understanding and knowledge of all species between the Skeena watershed and the Kitimat, would you say that the Skeena is better understood, better data collection historically and at present time?
16826. **MR. STEVEN GROVES:** Would it be -- could I ask what species or just in general?
16827. **MR. CULLEN:** I'll first start with general and we can get into some of the commercially viable species.
16828. But in the general assessment of effort that the department puts towards understanding stock assessment and habitat vitality, is the Kitimat and its estuaries as well understood as the other large river in the region, the Skeena?
16829. **MR. STEVEN GROVES:** It's a -- I would say that the information -- there would probably be more information on the Skeena watershed. It is a much larger watershed than the Kitimat and with also a lot more communities along it as well.
16830. But it certainly doesn't mean that the Kitimat watershed and marine area is not known. There has been some -- there has been research and such and studies done in that area as well.
16831. **MR. CULLEN:** Thank you.
16832. Can you tell me what the DFO's current state of knowledge is of the stocks in Area 6, which is the north end of the Douglas Channel?
16833. **MR. STEVEN GROVES:** Well, once again, if you're asking about what species again, so if I was to speak about salmon and herring, which are my area, I would say that we do have -- you know, I would say good information on that.
16834. **MR. CULLEN:** Can you do a little bit better than "good information"? What do you mean?

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16835. **MR. STEVEN GROVES:** We do have, for instance, when it were to come to salmon, we do have a good understanding about what species are in what area at what time in the freshwater environments and we could extrapolate a little bit and say, okay, well those salmon would be present in the marine environment at this time.
16836. And certainly, we have fisheries target those adult salmon. So we have a good understanding about that.
16837. If I were to switch over and say herring, we have a good understanding about when they should be in the area for spawning and we would have a good idea about certain -- you know, when the herring eggs hatch and the larvae are there. We would certainly know where they are.
16838. But then it becomes more uncertain with adult salmon and with adult herring as to where exactly they would go after that.
16839. **MR. CULLEN:** Thank you very much.
16840. Can I ask a specific question about your -- the department's understanding of juveniles in the estuary system in the Kitimat watershed? Is there strong baseline knowledge of -- and lifecycle analysis of fish as they come and forage in the estuary systems right now?
16841. **MR. STEVEN GROVES:** We would certainly have good information about where the juveniles would be when they first smolt and go to the ocean, but beyond that they tend to disperse. And we would certainly -- you certainly see juveniles in the inlet of different salmon species and throughout all times of the years -- through the year, but they are migratory and they do -- they will disperse. So they certainly go further than just -- you know, the Kitimat estuary.
16842. **MR. CULLEN:** Thank you very much.
16843. A more broad question about the spill risk assessment for freshwater spills, which are, depending on the flow of the tidal, as the Panel has heard many times before, can exist around the terminal. Did the Government of Canada review the Proponent's spill risk assessment for freshwater spills?
16844. **DR. CAROLINE CAZA:** This is Caroline Caza for Environment

- Canada.
16845. Mr. Cullen, Environment Canada did not review that for the freshwater component of the -- of the project.
16846. **MR. CULLEN:** Thank you, Ms. Caza. I'm not sure if I'm pronouncing your name right.
16847. The -- may I ask why not?
16848. **DR. CAROLINE CAZA:** That was a question that I believe was put to us when we were in Prince George and it had to do with the timing of the information that was provided I believe by the -- the Proponent.
16849. The Proponent filed additional information on the freshwater risk assessment considerably after the government had filed its evidence. So we had not reviewed that in -- at the time we testified on the freshwater component of the project in Prince George.
16850. **MR. CULLEN:** Have you reviewed it since?
16851. **DR. CAROLINE CAZA:** I think we're aware of that information but our focus in recent months has been on preparation to come to Prince Rupert to testify on the marine component of the project.
16852. So that is where the focus of our -- our preparations have been. But we are familiar with -- in a general way, with that information.
16853. **MR. CULLEN:** Thank you, Ms. Caza.
16854. And yet you can understand that the marine environment around the terminal can have a very much a freshwater nature. Was it the department's decision not to consider this, what I think would be a pretty critical component of the Proponent's application for this panel?
16855. **MS. LAURA MACLEAN:** Mr. Cullen, it's Laura Maclean.
16856. Environment Canada did look at the spill modelling scenarios in the marine environment that the Proponent provided as part of its application. And one of those scenarios did deal with a spill from the marine terminal, which

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presumably would have encompassed the -- the freshwater signal that I think you're -- you're getting at.

16857. **MR. CULLEN:** So just to be clear on our -- thank you for that -- on our terminology did -- is that considered a spill risk assessment that Environment Canada then performed?

16858. **MS. LAURA MACLEAN:** Well, it was the Proponent's spill modelling scenario study and it was conducted by the Proponent and their consultants. Environment Canada, for its part, conducted a review of that -- that report and that was conducted by my colleague Dr. Khelifa.

16859. **MR. CULLEN:** Thank you again.

16860. I'm just trying to understand. I very much appreciated that by the time Environment Canada, the federal government, submitted its response the Proponent had not yet offered up these scenarios where now where we are.

16861. Is what the federal government done in terms of assessing the spill risk assessment for freshwater spills all that the government plans to do to assess what those impacts and those models look like?

16862. **MS. LAURA MACLEAN:** So as Dr. Caza explained earlier, Environment Canada has, to date, focussed its efforts on the review of the Proponent's marine spill modelling studies and we have filed a detailed review of the results of that assessment that we completed. That was filed in the fall of 2012, I believe.

16863. **MR. CULLEN:** So, sorry, are you planning -- I guess my question is very specific. Now that you've seen the Proponent's application with respect to freshwater spills are you planning a similar detailed review for the Joint Review Panel?

16864. **MS. ANDERSON:** Madam Chair and Mr. Cullen, it's Dayna Anderson.

16865. I think we're getting into areas where Mr. Cullen might be seeking further evidence from Environment Canada at a very late stage of the hearings. I don't think there is any intention on the part of Environment Canada to file any further evidence at this point.

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16866. So I'm just wondering as well how this is connected to the evidence filed by the government participants and Environment Canada and again would just note that this is outside of Panel Ruling 99.
16867. **MR. CULLEN:** Madam Chair, if I may, what I've understood from the department is that they've done a detailed review of the fate and behaviour of a spill in the marine environment, what I assume is exclusively saltwater conditions.
16868. We've heard -- the Panel has heard extensively that in the marine environment immediately surrounding the terminal there is an often occurring a freshwater environment. The Proponent came in with that assessment at a later date that the government could then review it, do a detailed review as they've done for the ocean environment, for saltwater.
16869. My question is simply rather than just being familiar with what the Proponent has added to their proposal, is the government planning to do a detailed and proper review of the Proponent's spill risk assessment?
16870. **THE CHAIRPERSON:** Ms. Anderson?
16871. **MS. ANDERSON:** I think at this point the -- the Environment Department has done what they intend to do. They have filed that evidence with the registry.
16872. In terms of whether or not it was proper, the evidence that they've given, I'm not sure that that's a relevant question. But in any event it is up to the Joint Review Panel to assess the -- the evidence provided by the government, Proponents, based on testing by the intervenors. And I think that perhaps we're -- we're straying a little bit down a garden path here at this point.
16873. **MR. CULLEN:** Thank you for that. I hope not to take us down the garden path. What I was hoping to understand is that the sequence of events led to the point where the federal government did not do a spill risk assessment for freshwater spills for whatever the reason, a late submission or a sequence of submission.
16874. We -- the federal government has now said that they are familiar and have looked at the spill risk assessment for freshwater spills which exists in the

marine environment in this proposal.

16875. And my understanding in terms of the obligations of the federal government if they did a specific and detailed review for the saltwater ocean environment of spills I would assume that there would be keen interest to do a similar one for a freshwater spill in a very similar environment.

16876. And if my understanding is what the government has done is all its planning to do which is to simply look at the proposal, then I can move onto my next line of questioning?

16877. **THE CHAIRPERSON:** Do the witnesses have anything further to add to this question than has already been provided?

--- (A short pause/Courte pause)

16878. **MS. LAURA MACLEAN:** Hello, Mr. Cullen, it's Laura Maclean, and the members of the panel.

16879. We would take you back to the line of questioning that occurred on this topic in Prince George and transcripts will reflect that we did offer, if it would be of interest and valuable to the Members of the Panel, to turn our experts' minds to the review of the freshwater spill material. To date we're not in receipt of such a request. So for that reason we have not conducted a detailed review.

16880. We are, as my colleague, Dr. Caza has indicated, very familiar with the content of that material. And it -- just to sort of play this forward however, in terms of the role that the department might have going forward, we have made recommendations as part of our written evidence that address the interest that we have in seeking additional information on the behaviour and the fate of the products that would be shipped as part of the project.

16881. And so that information, when it becomes available should it become available, would help to inform the understanding of the behaviour of the product regardless of were it to be spilled in the freshwater or the marine environment.

16882. **MR. CULLEN:** Thank you for that.

16883. Is that for me to respond to, Madam Chair?

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16884. **THE CHAIRPERSON:** Mr. Cullen, I think it's for you to ask your next question.
16885. **MR. CULLEN:** Excellent.
16886. So just so I understand that last point and I will review those -- forgive me for not having reviewed all -- I'm not sure how many pages you're doing a day now of the testimony, but if the offer has been made and that the request -- just so I understand the process, the request then has to come from the -- the Panel itself to do a more detailed review of the spill risk assessment for freshwater spills.
16887. I'd like to turn our attention towards page 50, Adobe 50.
16888. **THE CHAIRPERSON:** Is this in the same volume, Mr. Cullen?
16889. **MR. CULLEN:** This is -- excuse me. I meant to call this exhibit up earlier. Exhibit E9-21-12, Government of Canada, page 43 -- excuse me. We're on page 50, Adobe 50.
16890. I can give the exhibit number, if that would help.
16891. **THE CHAIRPERSON:** That would be very helpful. Thank you.
16892. **MR. CULLEN:** It's A2U618.
16893. **THE CHAIRPERSON:** What we have displayed on the screen on the page that you referenced is 1.29, "No Net Loss Policy".
16894. **MR. CULLEN:** Thank you very much, Madam Chair. The sighted are leading the blind here.
16895. In this "No Net Loss Policy", it states that DFO's policy for the management of fish habitat defines mitigation as, quote:
- "...actions taken during their planning, design, construction or operation of works and undertakings to alleviate potential adverse effects on the productive capacity of fish habitats."*
16896. And that guiding principle of no net loss of the productive capacity of

fish habitat does not apply to oil spills.

16897. It continues on and says, and I'll quote:

"Fish habitat compensation plans would not address the impacts to fish habitat in the event of an oil spill, but are meant to address the impacts to fish habitat resulting from planned activities that are authorized under the Fisheries Act."

16898. If I'm reading this properly, the ---

16899. **THE CHAIRPERSON:** Mr. Cullen, sorry; it's Sheila Leggett. If I could just stop you again.

16900. I think we've gone off the page that we were on. Can you give us the reference number to where the response is that you're referring to? So it should be something like 1.29 and then a letter of the alphabet.

16901. **MR. CULLEN:** Yeah, I have response 1.29, but I don't have the letter of the alphabet.

16902. If you'll allow me, Madam Chair, as I -- we'll try to dig that up. The -- I think the officials from the department would be able to confirm that as the department's official policy towards no net loss and oil spills?

16903. **MR. BRAD FANOS:** Yes, Mr. Cullen. It's Brad Fanos.

16904. That's correct.

16905. **MR. CULLEN:** So let me -- I want to understand this because you could perhaps appreciate how, to the public, this might seem strange.

16906. The no net loss policy from the department and under the Act is a very -- I would suggest -- stringently and properly applied policy where it seeks to, as it says clearly in its -- by its definition no net loss. In not applying to oil spills, which can have a significant loss of habitat, I'm trying to understand at what point we make that type of policy decision.

16907. If no net loss is applied to the building of a dock or of the construction of this terminal facility that no net loss is applied, why is it not applied in the

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- event of an oil spill where one would imagine some habitat loss?
16908. **MR. BRAD FANOS:** There's a prohibition under section 36 of the *Fisheries Act* for the deposit of deleterious substances. So in this case, that's the administration is run through Environment Canada and our no net loss policy is not applied in that situation.
16909. **MR. CULLEN:** Can you help -- perhaps explain to me why -- just the distinction between the prohibition from Environment Canada and the DFO policy of no habitat loss. One does -- are you suggesting that one supersedes the other?
16910. **MR. MICHAEL ENGELSJORD:** Hi, it's Mike Engelsjord.
16911. So the no net loss principle that you're referring to, it's a guiding principle from our habitat policy. And that guiding principle specifically applies to when DFO is asked for an authorization for harmful impacts to fish habitat under 35(2).
16912. We don't issue authorizations for harm to habitat as a result of accidental spills, so it doesn't -- that's -- I don't know if that clarifies it for you. But it's written specifically for when DFO is considering authorization.
16913. **MR. CULLEN:** I understand. So the no net loss policy and the way that you apply it is for known events, not for oil spills and accidents of the like?
16914. **MR. MICHAEL ENGELSJORD:** That's right. It only applies to impacts that are authorized by DFO or are being considered for authorization, not for breaches of the Act. That's an issue for -- potentially for prosecution.
16915. **MR. CULLEN:** So -- I understand that, and that's very helpful. Thank you.
16916. I guess my question -- this will be one of my last questions, Madam Chair -- is that in the application of the no net loss policy, oftentimes the department will seek for a Proponent to make up the fish habitat that has been destroyed through a planned activity.
16917. In the -- in your experience, can the same application be made but through the section of the *Environment Canada Act* (sic) that habitat must be

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- restored to an equivalency or some other habitat made to compensate for that which was lost?
16918. **MR. MICHAEL ENGELSJORD:** The only situation I'm aware that that may happen is if there was a prosecution under the law and a conviction and the courts required some money or some restoration of damages.
16919. **MR. CULLEN:** So just in the powers that exist under the Acts for you, in the event of an oil spill and habitat loss through -- at an estuary, let's say, to make it specific, the Act does not provide you with the powers other than ordered by -- well, does not provide you with the powers to order new habitat to be created to compensate for that which was lost?
16920. **MR. MICHAEL ENGELSJORD:** No, it does not.
16921. **MR. CULLEN:** Interesting.
16922. I think, Madam Chair, with that I'll end my line of questioning perhaps a bit early and relieve us all of this difficult challenge of doing this by telephone in 5,000 kilometres.
16923. I want to thank you very much to the Panel and your very capable and amazing staff for accommodating my needs and appreciate all the witnesses who are able to help guide me in this process as well.
16924. **THE CHAIRPERSON:** Thank you very much for your participation, Mr. Cullen, even at a distance. Your questions were clear and were always helpful. The additional evidence that we get is helpful to the Panel in our considerations that we need to make.
16925. **MR. CULLEN:** I can offer you this, Madam Chair, that the House of Commons I'm about to walk into in the next 20 minutes will always be much less clearer than what we just participated in, so thank you.
16926. **THE CHAIRPERSON:** Thank you for your participation, Mr. Cullen.
16927. So we'll stop now for lunch and come back at 1:15, please, everyone.

16928. Thank you.

--- Upon recessing at 12:13 p.m./L'audience est suspendue à 12h13

--- Upon resuming at 1:14 p.m./L'audience est reprise à 13h14

BONNIE ANTCLIFFE: Resumed

MICHAEL ENGELSJORD: Resumed

BRAD FANOS: Resumed

JOHN FORD: Resumed

STEVEN GROVES: Resumed

THOMAS KING: Resumed

TRACEY SANDGATHE: Resumed

CAROLINE CAZA: Resumed

SEAN BOYD: Resumed

CARL BROWN: Resumed

CORAL deSHIELD: Resumed

CHRIS DOYLE: Resumed

DAN ESLER: Resumed

GRANT HOGG: Resumed

BRUCE HOLLEBONE: Resumed

RICHARD HOLT: Resumed

ALI KHELIFA: Resumed

LAURA MACLEAN: Resumed

KEN MORGAN: Resumed

PATRICK O'HARA: Resumed

BARRY SMITH: Resumed

JENNIFER WILSON: Resumed

XUEBIN ZHANG: Resumed

JOHN CLARKE: Resumed

HEATHER DETTMAN: Resumed

16929. **THE CHAIRPERSON:** If we could get everyone to take their seats, please, we'll be ready to reconvene.

16930. Just while people are taking their seats -- excuse me. We're ready to get underway. Thank you.

16931. Just as people are taking their seats, the Panel issued a communication later last week saying that we're going to be following the time, and it appears that we will finish with questions of the Government of Canada by the end of this two-

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week session. And at the moment, we're not seeing that we will need to sit the week of May 13th.

16932. So we'll continue to follow and monitor that. So we will sit each morning at this point, anyway, at 8 o'clock. And we anticipate sitting each day until 4 o'clock in the afternoon, so just so everybody knows.

16933. Now, when we get to 4 o'clock, if we're in the process of just about finishing some questions of one of the parties, then we'll probably just finish up those questions so that we're ready to start with the new party the next day. So the 4:00 o'clock is a soft 4 at this point.

16934. Madam Niro, I was remiss in not getting an AQ number for the Coalition when they were questioning this witness panel.

16935. Would you please give us one of those?

16936. **THE REGULATORY OFFICER:** And that will be AQ87.

**--- AID TO CROSS-EXAMINATION NO./AIDE AU CONTRE-
INTERROGATOIRE No. AQ87:**

*ForestEthics Advocacy, Living Oceans Society and Raincoast Conservation
Foundation - "The Coalition" - Aids to cross-examination of the Government
of Canada Panel 1.*

16937. **THE CHAIRPERSON:** Thank you very much, Ms. Niro.

16938. Do we have all the witnesses now back?

16939. And do we have the remote witness -- the witnesses who are participating remotely?

16940. Dr. Zhang?

16941. **DR. XUEBIN ZHANG:** Yes, I'm here.

16942. **THE CHAIRPERSON:** Mr. Holt?

16943. **MR. RICHARD HOLT:** Yes, I'm here.

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16944. **THE CHAIRPERSON:** Thank you.
16945. And Dr. Brown?
16946. **DR. CARL BROWN:** Yes, I'm here. Thank you.
16947. **THE CHAIRPERSON:** Thank you very much.
16948. So it appears that we have a complete witness panel. So with that, we'll say good afternoon to Mr. Janes representing the Gitxaala Nation and turn it over to you for your questions.
16949. **MS. ANDERSON:** Madam Chair, I apologize for the interruption.
16950. We just have one brief preliminary matter before we begin.
16951. **THE CHAIRPERSON:** My apologies for not calling for them.
Thank you.
16952. Ms. Bird.
16953. **MS. BIRD:** Good afternoon. Sarah Bird for counsel for the Government participants.
16954. We'd just like to introduce Steven Watkinson. He's there at the back next to now Jennifer Wilson. He's just here with the Department of Fisheries and Oceans as witness support for this afternoon.
16955. **THE CHAIRPERSON:** Thank you very much for the introduction, Ms. Bird.
16956. **MS. BIRD:** You're welcome.
16957. **THE CHAIRPERSON:** Are there any other preliminary matters that parties wish to raise?
- (No response/Aucune réponse)
16958. **THE CHAIRPERSON:** Well, then, Mr. Janes, it is over to you at

this point. Thank you.

--- EXAMINATION BY/INTERROGATOIRE PAR MR. JANES:

16959. **MR. JANES:** So as you may have just heard, my name is Robert Janes and I'm assisted by Ms. Mathers here. We are counsel for the Gitxaala First Nation. I think everybody who needs to know knows where that is and knows their role. So with that I will head into it.

16960. I will say a great many of my questions today are focused around methodology and approach to assessment of effects and so bear that in mind. And with that, I will direct my first question to Ms. Caza, although if there is somebody else who is better situated to answer the question, please feel free to direct it.

16961. I'm not particularly interested -- except for a few questions for Mr. Hollebhone -- in directing questions to anybody in particular, just to the best person.

16962. So is it fair to say that the assessment of an environmental effect and/or significance depends on understanding the -- what the place or area affected is being used for or is valued for?

--- (A short pause/Courte pause)

16963. **DR. CAROLINE CAZA:** Thank you, Mr. Janes, I'm going to refer your question to my colleague, Laura Maclean, to answer.

16964. **MS. LAURA MACLEAN:** If you wouldn't mind, I would ask if you could just repeat the question.

16965. **MR. JANES:** Well, maybe I'll use some examples and maybe do it a step at a time rather than trying to set it up this way. And I'll pose a hypothetical for you to help frame the question.

16966. Suppose an area is used for food purposes as opposed to not being used for food purposes. And I'm going to suggest to you that the effects of an oil spill on that area may be assessed differently depending upon the issue of whether or not the area is used, say, by a First Nation for food purposes.

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16967. **MS. LAURA MACLEAN:** Thank you.
16968. So you're getting at the notion of assessing impacts on traditional uses and, certainly, that is a requirement of the *Canadian Environmental Assessment Act* process.
16969. And as part of discharging that requirement, yes, it would certainly as a starting condition be important to have an understanding both of the baseline environmental resources and also of the uses made of those resources. That's -- I think that's a fair statement.
16970. **MR. JANES:** And I'm going to suggest that that's not just the case in the example of traditional use and I'll use something from Ms. -- what I suspect is Ms. Caza's background judging from the -- her resume.
16971. But even if we look at normal environmental clean-up -- for example, if you're restoring an area for use as a residential purpose as opposed to an industrial purpose, you may very well assess the situation differently.
16972. Is that fair?
16973. **DR. CAROLINE CAZA:** If you're referring to the clean-up of a contaminated site, which is an area I have some background in, in a general sense, you may establish different clean-up standards depending on what the anticipated use of the area is, yes.
16974. **MR. JANES:** And in looking again in the context of environmental assessment, where as I understand it we look not only at questions of what is the effect, say for example, the time of the oil spill, but also look at issues such as mitigation and remediation to assess what the long-term effects might be, appreciating what the area is used for then is significant to truly assess the effect of an oil spill, for instance.
- (A short pause/Courte pause)
16975. **DR. CAROLINE CAZA:** Just trying to think of a -- sort of a practical example of that in the context of some of the things that, for example, Environment Canada has talked about in relationship to this Project.
16976. One of the concepts that we've talked about in our evidence is the

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- concept of clean-up end points in a post spill scenario. That is -- if I understand correctly the issue that you're getting at, that is one of the practical ways in which we try to address how different areas may be evaluated for remediation, for example, based on, among the factors, the ones that you've referred to.
16977. That's not my area. If you wish to talk more about end points, we do have a couple of people with us who can provide you with more information about how that might apply to address your point.
16978. That's not specific to the environmental assessment process, but it is something that we've envisioned as being important in relationship to where -- how we might address a spill.
16979. **MR. JANES:** Well, just let me ask you, though, about that last point about it not being important to the environmental assessment process.
16980. I'm going to suggest to you that, to the extent that statements are made to the effect or conclusions are drawn to the effect that, for example, effects of an oil spill may be remediated within 5 to 10 years, say for example, I'm going to suggest to you that that conclusion to some extent may depend upon understanding what end point the person has in mind when they're making that statement.
16981. So for example, if they're thinking of it from an aesthetic point of view, that might be one thing; if they're thinking of it from an animal population point of view, that might be a different thing; if they're thinking about it from a human food consumption point of view, that might be yet a different end point again.
16982. So in the context of an environmental assessment and commenting on longer term effects of an accident, for example, end points and understanding the end points are important.
16983. Isn't that fair?
16984. **DR. CAROLINE CAZA:** Yes, although I do want to make a distinction between the way I used "end point".
16985. My sense if you're using it a more general sense to imply your objective or your goal and I was actually speaking about it specifically as it's used

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- in the context of spill response and spill remediation and so on.
16986. So I just want to make sure that distinction but, in general, if I understand what you're saying, yes, I would agree.
16987. **MR. JANES:** Is there anybody who wants to add to that?
16988. I don't want to foreclose anybody's chance to improve my knowledge of this area before I elaborate on this a bit more.
16989. **MR. GRANT HOGG:** Hi, I'm -- my name is Grant Hogg. I'm the Director of the Environmental Emergencies Program.
16990. And when there is a spill of oil that could make its way to a shoreline, one of the roles that Environment Canada can play is in the conduct of a shoreline clean-up assessment technique. And one of the important parts of that whole process is establishing end points that are agreed to by those experts and those people who have an interest in that area that's affected.
16991. And so those -- establishing those end points, some of the factors that are considered are: What is the baseline environment look like relative to areas that are not affected by that shoreline?
16992. So what would have to -- what would be the -- what would success look like in the minds of the -- the experts who have some knowledge on the -- the biotic activity that was associated with that shoreline. And as well, what are the -- the other land use interests associated with that -- with that shoreline, whether it be for -- for eating purposes or other uses.
16993. And so, the -- it's not necessarily a straight line, it's -- it's a collaborative process and it's better when all those who have an interest in it have some buy into those endpoints because oftentimes you may find that the fisheries person isn't necessarily -- their endpoint might be different than an endpoint for someone who might have a -- another interest in that -- in that shoreline. And so coming up with a common goal is a really important part of that process.
16994. **MR. JANES:** And so let's just explore that a bit more and use a fisheries example. So if you're looking at it from the perspective of biota or let's say shellfish populations, it may be that you can restore a shellfish population to its previous population levels an extent, but that does not necessarily mean that it

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would be suitable for human consumption depending upon what contaminants remained?

16995. **MR. GRANT HOGG:** This is a hypothetical situation. I think that the -- the generic goal is to try and get that environment that's been affected back to its original state where -- where possible. In some cases it may not be -- it may not be possible and some compromises have to be -- have to be made. But the -- the ultimate goal is to try and get this -- essentially eliminate the environmental impact of that -- that oil spill in this hypothetical situation.

16996. **MR. JANES:** But then just to take that point then, fundamentally it's important then to understand when we're looking at the question of what are the effects of a spill, whether -- including the process of remediation, is understand what was that environment actually used for and what do we want to use it for in the future; is that fair?

16997. **MR. GRANT HOGG:** During the time of a -- of a response to an emergency, those would be important questions to consider in establishing the endpoints.

16998. **MR. JANES:** What I'm going to suggest to you, and this then maybe is more of an assessment question than a response question, if we're evaluating the issue of whether or not it is possible to respond to a situation so as to restore it to its -- to an acceptable state, one that -- that in some way can be evaluated at the assessment stage of things, it is important to appreciate the question of how that environment is used and whether the response is reasonably capable of returning it to its previous use. Is that fair?

--- (A short pause/Courte pause)

16999. **DR. CAROLINE CAZA:** Well, and I'm speaking here, the environment department commenting on our understanding of how an assessment, an environmental assessment process would work. But yes, it's our understanding that that would form an important part of an environmental assessment.

17000. **MR. JANES:** Now, I would like to turn something -- to more something on the lines of socio-economic effects and just expand upon that a little bit. I take it that -- well, maybe you won't agree with me, but I'd hope you'd agree with me that to some extent the question of whether the people who use a

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resource in an area will return to using that resource, relates not only to the objective data with respect to pollutant levels, restoration et cetera, but also depends upon their perception of how effectively the area has been restored to its previous state?

17001. **DR. CAROLINE CAZA:** Sorry, I was just checking to see whether we could assist you with an answer to that question.

17002. I think with that -- with that particular question you've posed, I think certainly, from an environment's perspective, we feel you've gone a little bit beyond what we are really able authoritatively to -- to answer.

17003. If you're asking whether people's perception of how -- whether an area is -- is remediated, is an important part of an assessment process, I think we would be a little bit uncomfortable in claiming that we would have the -- the knowledge and experience to answer that, if I understood the question correctly.

17004. **MR. JANES:** Well, I was actually asking something a little bit narrower than that, and I'm getting at the question of what constitutes an effect, and it may be that it will illustrate what you did or didn't consider in your materials and -- and so even that will help.

17005. So let me pose a hypothetical to maybe make my question a bit more intelligible. So if you have a situation where people avoid, for example, a shellfish harvesting area because of the perception that it is no longer pristine or it has been polluted, irrespective of the objective evidence of pollution being present, would you agree with me that that is, in fact, an effect on human behaviour induced by the original spill, which -- which would constitute a socio-economic effect?

17006. Or alternatively, if you wish to use another section, an effect on traditional harvesting if we're talking about a traditional community. In some ways, I've heard the description of avoidance being used as a technical term for this.

--- (A short pause/Courte pause)

17007. **DR. CAROLINE CAZA:** Yeah, I think you can see that we're -- we're struggling a little bit with how we would answer that.

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17008. In terms of our understanding and in terms of how we would approach an environmental effect, I think we would be -- I think we would tend to look for the -- we would tend to focus our interpretation of an environmental effect on evidence that's related more to the actual impact on the environment.

17009. The judgment -- the assessment of perception and changes in behaviour associated with that, I think we would acknowledge as potentially an important part of an overall assessment. But you know, it's not an area that we as a department provided evidence on and I think that -- I'm not sure that we would consider ourselves to have the expertise to assess that as an actual effect.

17010. **MR. JANES:** Okay. So maybe this will shorten things up a bit. So when we read your commentary on -- and I don't mean commentary in a negative or positive way, just descriptive way, on effects and whether effects exist or have been mitigated or any of the other descriptors that may be applied to effects, we should not take that as extending to effects such as effects on human behaviour that aren't directly correlated to a physical existing change in the environment, in other words, an effect such as the ones that I just described?

17011. **MS. LAURA MACLEAN:** Certainly for Environment Canada's part, we have concentrated largely our technical review on the changes that may result from the project on environmental resources.

17012. But I would add to that that certainly we acknowledge that many of those environmental resources may be required for the exercise of certain Aboriginal rights and they may be required for the exercise of traditional uses and we -- we have been following with interest, certainly, the views of the Gitxaala Nation in terms of the -- the uses that they make of those resources and have endeavoured to the extent our technical abilities and our mandate allows to focus our review on how environmental resources that are valued and used could be affected by the Project.

17013. **MR. JANES:** So just what then -- because this has also come up in your evidence as well -- I take it then that once this process has finished and we've moved on to the next stage of the process where you'll be evaluating the information gathered, I take it that you do not see it as part of your technical review at that stage to look into the kinds of effects we've just been discussing, namely effects on human behaviour in terms of the use of resources or the value attached to resources that are not directly correlated to an existing physical state in the environment?

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17014. **DR. CAROLINE CAZA:** In response to that, I think we'd say, to a certain extent, we will be looking to -- well, we'll be doing two things: We'll be looking to the Panel's final report and our understanding that the Panel is to play an important part in assessing these aspects of the Project. So that information will inform us as we go forward in our thinking.
17015. But also in terms of how, collectively, the government is approaching consideration of Aboriginal interests and rights in the context of this Project, we are working with other departments on an ongoing basis to collectively bring our knowledge and understanding to these issues.
17016. So while Environment Canada itself may not feel it has the technical expertise to do that, we will be looking and are looking within government for information to help us understand that -- in addition, of course, as I might say, to the information that's being put before the Panel by the First Nations themselves.
17017. **MR. JANES:** And just let me take this a step further and really moving back to the first couple of questions I asked.
17018. And, actually, Mr. Hogg, this may actually feed partly into your analysis. I take it part of what the government sees happening as a part of moving forward this Project is that further information will be gathered through traditional land use studies or other types of studies carried out in collaboration with various First Nations to gather information about use of areas, about valued components to shorelines, beaches, the water, in order to help inform response plans.
17019. Is that a correct understanding of how the Government sees this proceeding?
- (A short pause/Courte pause)
17020. **MS. LAURA MACLEAN:** Certainly, insofar as the Proponent has suggested various planning activities should the Project proceed, such as coastal sensitivity mappings, such as geographic response plans then, yes, I think that would be true.
17021. **MR. JANES:** And to be clear, when we're talking about sensitivity mapping, in part that's talking about identifying areas of value to First Nations for the exercise of traditional harvesting activities, correct?

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17022. **MS. LAURA MACLEAN:** It is my understanding from the Proponent's commitments that they have made -- they've certainly committed to doing so as part of those exercises, yes.
17023. **MR. JANES:** And so do I understand from the way that you framed the answer, it's not the Government's intention to carry out any studies like this but, instead, to rely upon Enbridge to carry out those studies?
17024. **MS. LAURA MACLEAN:** Well, Environment Canada for its part has made a number of recommendations about some of the additional information that we feel would be helpful to further characterizing the potential effects of the Project and informing spill response plans.
17025. However, as to how the Federal Government participants would specifically be involved, I would submit that would hinge on how the Panel frames its conclusions and recommendations and in terms of any conditions that might be applied and how Government might be implicated in delivering those conditions.
17026. **MR. JANES:** So my question right now is directed at what -- and I'll narrow it to Environment Canada's present vision is.
17027. At present, Environment Canada has not envisaged carrying out those kinds of studies itself but intends to rely upon the Proponent?
17028. At present?
- (A short pause/Courte pause)
17029. **MS. LAURA MACLEAN:** Sorry, just deciding which of us is in the best positioned to offer a view here.
17030. At this stage, I think it is a little bit premature to suggest how Environment Canada might be involved because, as I have said before, there are steps that remain to be taken in this process.
17031. However, it would be a relatively standard practice to rely on Proponents to deliver on follow-up monitoring requirements associated with the environmental assessment process.

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17032. I would say that Environment Canada, should the Project proceed, would anticipate a role in continuing to provide expertise to the Proponent and perhaps going so far as to continue to make recommendations and serve as -- in an advisory capacity to work that the Proponent might be undertaking.
17033. **MR. JANES:** Okay.
17034. So with that, I'd like you to turn to the Exxon Valdez and get into some more technical information. And it would be helpful if you got up your -- it's actually Exhibit E9-29-09 -- sorry, 21, I'm sorry, -09.
17035. So let me say that again: Exhibit E9-21-09, PDF pages 69 and 70.
17036. It starts right at the bottom of 69. Most of the interesting material is on page 70 and I just want to make sure that I understand this, and I just want to clarify a few points.
17037. So I take it from your review of the science or the scientific publications, there are scientific publications out there which indicate that there are environmental effects arising out of the Exxon Valdez spill that can still be observed up to two decades after the event.
17038. Is that fair?
- (A short pause/Courte pause)
17039. **MR. JANES:** And if you need -- take a moment, I'm going to ask a few questions of both sea otters and killer whales so why don't you take a moment and just read the passage and when you're ready, answer.
17040. Don't feel you have to be rushed.
17041. **MS. BONNIE ANTCLIFFE:** It's Bonnie Antcliffe here with Fisheries and Oceans.
17042. I'd just like to point out that the documents you're referring to are DFO's evidence. So DFO will answer ---
17043. **MR. JANES:** As I said, anybody who wants to answer and is best

positioned to answer can feel free to wade in.

--- (A short pause/Courte pause)

17044. **DR. JOHN FORD:** Yes, I was wondering, could you please just rephrase the question, now that I've had a chance to see what it's about?

17045. **MR. JANES:** I'll try to restate the question rather than rephrase it.

17046. **DR. JOHN FORD:** Restate, yes.

17047. **MR. JANES:** As best I can.

17048. So my question is -- and I want to do this a piece at a time, so bear with me a little bit. So my first question is: Is it fair to say that your review of the scientific literature indicates that there is scientific literature that would support the view that there are environmental effects being felt from the Exxon Valdez spill up to two decades after that event?

17049. So to be clear, my question is about the scientific -- the state of the scientific literature first and then we'll go a bit deeper into what the literature says.

17050. **DR. JOHN FORD:** Certainly. Excuse me. With respect to sea otters and killer whales in Prince William Sound in the area of the -- of that oil spill, **yes, I believe that the scientific evidence does show persistent effects two decades later.**

17051. **MR. JANES:** Well, I'm also going to suggest to you that actually implied in the paragraph that we just -- that you're referring to here, that I've brought you to, it also suggests that there are effects in benthic insects as well, namely you -- I'd suggest that if you are observing bioaccumulation rising out of the consumption of benthic insects, that indicates that the benthic insects also have within them hydrocarbons that otherwise would not have been present.

17052. **DR. JOHN FORD:** My understanding from research that's been published regarding sea otters is that they are excavating as they do for invertebrate prey in the benthos, in the soft substrate and certain areas in Prince William Sound and are becoming exposed or releasing residual oil from that activity. I'm not familiar with the pathways for any ingestion of hydrocarbons.

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That's out of my area.

17053. **MR. JANES:** Okay. So that's actually helpful. So in other words, what we're actually seeing then is that the situation for sea otters is that we may actually see them being exposed directly to hydrocarbons that are essentially contained in the benthic substrate that they're digging through to get at insects?
17054. **DR. JOHN FORD:** That's correct. This is described in a paper published in the peer reviewed literature last year.
17055. **MR. JANES:** So in terms of the physical effects on the environment, animal populations of the Exxon Valdez spill, up to 20 years later we still see hydrocarbons remaining in the benthic substrate. I think that's the right phrase is it?
17056. **DR. JOHN FORD:** Yes.
17057. **MR. JANES:** You're nodding your head up and down.
17058. The benthic substrate that can affect animals that use that substrate.
17059. **DR. JOHN FORD:** Yes, that's the conclusion of that publication that I was referring to.
17060. **MR. JANES:** Okay. So in terms of what we see, we see oil persisting in the benthic substrate and we see the oil affecting the -- hydrocarbons affecting the sea otter populations?
17061. **DR. JOHN FORD:** I'm not certain that the conclusion of that study was that it was affecting the sea otter population. I think it was basically showing that there is the potential for exposure to oil through that process but I don't think it specifically tried to extrapolate to a population scale effect.
17062. **MR. JANES:** So we have the classic -- you can't jump from two observations of a correlation to necessarily a causal relationship but what we -- so we have two separate pieces of data. There appear to be still effects being felt in the sea otter population; correct?
17063. **DR. JOHN FORD:** There's that pathway for exposure, yes.

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17064. **MR. JANES:** And then we do have an observation of the oil being present in the substrate?
17065. **DR. JOHN FORD:** Yes.
17066. **MR. JANES:** And then of course it's -- as all science is provisional, we now have a question posed for some future research of that -- is that the cause as opposed to some other cause?
17067. **DR. JOHN FORD:** Extrapolating -- excuse me. Extrapolating to population level effects is always problematic in terms of linking it to any single source or cause. In the case of sea otters, some populations are increasing.
17068. Others in Alaska are decreasing and have been for many years outside of the area of any oil spill. It's -- there's some ecosystem changes that may be driving population trends that may not or may partially be related to many different factors.
17069. **MR. JANES:** Right. Which is not unusual in ecological systems, that is, very complex to unravel the exact causes but here we do have evidence that would suggest the persistence of oil and a population change following the Exxon Valdez oil spill ---
17070. **DR. JOHN FORD:** Yes.
17071. **MR. JANES:** --- in sea otters?
17072. **DR. JOHN FORD:** Yes.
17073. **MR. JANES:** Right. And of course, I'd also suggest to you that it may be that the larger ecological changes combined with the Exxon Valdez oil spill may have led to more dramatic effects than would otherwise have been the case? So in fact, there may be relationships between causes.
17074. **DR. JOHN FORD:** That's plausible but I'm not well versed enough with the population trends of sea otters generally in that part of Alaska to be able to comment with any kind of confidence.
17075. **MR. JANES:** Right. But what we do come back to is that this is a phenomenon that's been seen and commented on in the scientific literature?

17076. **DR. JOHN FORD:** Yes.
17077. **MR. JANES:** And I'd like to just come back to your comments this morning about killer whales because again, when we read this paragraph -- again, the scientific literature observes a decline in the -- an ongoing decline or reduction I'll use -- is probably the better word -- in the population of orcas in this area post the Exxon Valdez oil spill?
17078. **DR. JOHN FORD:** Yes.
17079. **MR. JANES:** Which did not clear up in five to 10 years?
17080. **DR. JOHN FORD:** Those -- the groups that were -- that experienced the declines after the spill have not recovered and it's thought that because of the low reproductive potential of these animals plus the -- what appear to be social factors that lead to survival of offspring that the loss of key individuals in these groups can destabilize the social structure such that recovery may take decades.
17081. **MR. JANES:** Right. And I'm going to suggest to you that it's not uncommon to be faced with the situation where an adverse environmental effect may have a more severe impact because of other -- what I'd call -- confounding social or environmental problems that exist independently?
17082. **DR. JOHN FORD:** Certainly in the case of this particular species, yes. There's incidents that are related to mortality by any means can have the potential to -- as I said, to cause shifts in the survival rate of offspring. There's a long period of dependency in these animals and it can take some time for them to recover.
17083. An example would be southern resident killer whales in British Columbia and Washington State that were -- that experienced effectively a high mortality rate during the 1960s and seventies due to live captures for aquaria. And that tended to affect the whole demographic structure of the group and it took decades for those effects to diminish in that population.
17084. **MR. JANES:** Right. So in a sense, it's an issue of making a bad situation worse in some ways. That is, that you have one thing that creates a bad situation, then if you pile on top of that an oil spill, it may actually make things worse?

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17085. **DR. JOHN FORD:** Yeah, these animals certainly take -- can take long periods of time to recover from those kinds of incidents.
17086. **MR. JANES:** And isn't it fair to say that -- and I may be venturing a little bit out of my field of knowledge here but that many of the large cetacean populations have had a history of -- if you wish -- a bad situation over the last century or two, from which many of them are still recovering. Isn't that fair?
17087. **DR. JOHN FORD:** This would be other species of cetaceans related to whaling?
17088. **MR. JANES:** Correct.
17089. **DR. JOHN FORD:** This kind of ---
17090. **MR. JANES:** Well, I mean, if we take the big ones like humpback whales, grey whales, I guess the sea whale is a little bit of a mystery, we do have this problem that these are not populations that are at their historic healthy high points, but in fact are in the process of recovering from historic problems that have led to very significant population declines?
17091. **DR. JOHN FORD:** Yes that's -- excuse me. That's true for many marine mammal species in British Columbia. Most of the large whales were depleted from whaling that took -- that ended in the late 1960s but it was many, many decades of intensive hunting.
17092. Some populations like the humpback whale are recovering very well and may be at historical levels now. Others, like the blue whale and the sei whale, have failed to recover to anywhere near the same extent and it's not at all clear why some species recover more quickly than others. It's somewhat related or part of it is related to the population demographic.
17093. Some just have a greater reproductive potential than others but some species have simply failed to recover but -- and that's not just the cetaceans. The marine mammals, seals and sea lions were widely depleted on this coast through control programs and harvests mostly. That ended in the 1960s and their populations are rebounding quite strongly now.
17094. **MR. JANES:** But when we do look at the potential effects of either

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- the operations of the -- the marine operations of this Project or, alternatively, the accidental discharge of oil, it's in that context that some of these species are in 'recovery mode', if you wish?
17095. **DR. JOHN FORD:** Some species are certainly in 'recovery mode', as you say.
17096. **MR. JANES:** Yes. Okay.
17097. Now, I'd actually like to turn some questions to -- and I think Dr. Hollebhone, you may be -- have I pronounced your name properly?
17098. You may be the best person to answer this, but again, if I've picked on the wrong victim, please feel free to send the question to whoever is most appropriate to answer it.
17099. Is it fair to say that the effects of an oil spill will depend on the physical properties of the substance spilled?
17100. **DR. BRUCE HOLLEBONE:** Well, the intrinsic characteristics of something in the environment are -- yeah, that's the basis from which we make a lot of those decisions, yes.
17101. **MR. JANES:** Right.
17102. And so on one side -- and there's a lot of evidence about this -- there's sort of the toxicology that's associated with the substance that ends up in the water?
17103. **DR. BRUCE HOLLEBONE:** M'hm.
17104. **MR. JANES:** Is that fair?
17105. **DR. BRUCE HOLLEBONE:** Yeah.
17106. **MR. JANES:** And that, of course, directly goes to what effect that it has on the creature exposed to it?
17107. **DR. BRUCE HOLLEBONE:** Right.

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17108. You're rapidly getting outside my area of expertise.
17109. **MR. JANES:** I'm going to come back to your area. Most of my questions are going to deal with oil and water mixing.
17110. **DR. BRUCE HOLLEBONE:** Okay.
17111. **MR. JANES:** Which I think is pretty core in your area.
17112. **DR. BRUCE HOLLEBONE:** Okay.
17113. **MR. JANES:** But I just want to just sort of clear some of the underbrush out of the way first.
17114. Another example would be, in some cases, there can actually be sort of smothering effects on certain creatures if you get them coated with oil.
17115. Is that fair?
17116. **DR. BRUCE HOLLEBONE:** Again, that's something I've read in the literature and discussed with co-authors, but it's not my direct relevant area of research.
17117. **MR. JANES:** And I'm sure that somebody out there in the crowd would confirm that, in the case of birds, you can have the problems that come with oil getting on their feathers and that interfering with heat insulation, for example?
17118. **DR. BRUCE HOLLEBONE:** Well, I would suggest as well that there are much better people qualified to speak about that here today.
17119. **MR. JANES:** Right.
17120. But now, let me come to the question of sinking versus floating.
17121. **DR. BRUCE HOLLEBONE:** M'hm.
17122. **MR. JANES:** I will suggest that the effects of whatever ends up in the water in the case of a spill, to some degree, depends upon whether it sinks or floats when it spills.

17123. Is that fair?

17124. **DR. BRUCE HOLLEBONE:** You're talking about routes of exposure with regard to physical fate.

17125. I mean, in general, that's true, that you change the behaviour of the oil and, in general, the potential for exposure changes as well, yes.

17126. **MR. JANES:** It may affect different creatures depending upon where it is in the water column?

17127. **DR. BRUCE HOLLEBONE:** This is true, yes.

17128. **MR. JANES:** And again, somebody else -- actually, probably Mr. Hogg can comment on this -- I presume also that the effectiveness of certain response activities depends on whether the oil is on -- excuse me, the hydrocarbon is on the surface or down in the water column.

17129. Is that fair?

17130. **MR. GRANT HOGG:** Yeah, I guess the information that we get from people like Bruce which would tell us what's going to happen to this oil as it moves through the environment would inform which response actions one would take to try and contain that spill as effectively as possible.

17131. **MR. JANES:** You're actually a step ahead of me.

17132. **MR. GRANT HOGG:** Okay.

17133. **MR. JANES:** You could essentially take it that lawyers know nothing and so need to be instructed at each stage of the process.

17134. And so let me try to put a simple illustration -- and maybe I'll get this wrong -- if you know that the fuel that's spilled or the hydrocarbon that's spilled is going to be floating on top of the water, then booming, for example, may be at least a somewhat effective means to partially control the spread of the substance spilled.

17135. Is that fair?

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--- (A short pause/Courte pause)

17136. **MR. GRANT HOGG:** Depending upon where you're going with your questions, this may be more relevant to Panel 2 where we're talking about preparedness and response.
17137. So I would say, generically, if something is floating, booms can be -- depending upon the conditions of the spill and the weather conditions, et cetera, can be a good instrument to use to contain the spill.
17138. **MR. JANES:** Right.
17139. And let me just explain why I'm asking these questions as a preliminary to the questions -- the more technical questions I want to direct to Dr. Hollebone, which is I want just at this stage to establish the relevance of the question of sinks versus floats.
17140. I'm not particularly interested in, you know, a description of how booming works or how dispersants work. I merely want to establish that the effectiveness of different responses may depend on whether the substance is on the surface or down in the water train -- in the water column, rather.
17141. Is that a fair statement?
17142. **MR. GRANT HOGG:** I think that would be a fair statement.
17143. I'm wondering if Dr. Carl Brown, who is on the line, might have anything else to add.
17144. **MR. JANES:** Dr. Brown?
17145. **DR. CARL BROWN:** Hi, it's Carl Brown.
17146. Yes, I agree. Depending whether the oil is on the surface or in the water column makes a big difference on the spill kind of measure you may choose to use.
17147. **MR. JANES:** And likewise, I'm going to suggest to you that it also seems that whether the water -- the hydrocarbon floats on the surface or ends up

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- sinking affects questions such as how quickly it disperses.
17148. And I'll use the example of something on the surface is more likely to evaporate quickly than something that's, say, two or three feet under water?
17149. **DR. CARL BROWN:** That's probably a better question for Dr. Hollebhone but, certainly, you're not going to get evaporation of oil that's under water.
17150. **DR. BRUCE HOLLEBONE:** I would -- where the oil is in the environment obviously strongly affects what can happen to it as well.
17151. So, yes, I would, in general, agree with your opinion.
17152. **MR. JANES:** Now, to really get back to it, the question of sink versus float, for one thing, it depends upon what is actually in the material that's spilled. And so let me just break that into pieces.
17153. So it depends upon -- and I'm going to give you a list: the characteristics of the bitumen, if we're talking about dilbit, the characteristics of the condensate, and then also the mix of the condensate and the bitumen.
17154. Is that fair?
17155. **DR. BRUCE HOLLEBONE:** Well, we need to consider the product that we're thinking about here.
17156. Dilbit is a mixture and it's a mixture as much as your coffee and your cream is a mixture. It's not separable back into coffee and cream as such.
17157. So if you're considering the fate and behaviour of dilbit, that's one thing, but we should make a distinction between dilbit and, say, bitumen, raw bitumen, because they're really not the same thing and they'll behave in different ways.
17158. **MR. JANES:** Right.
17159. But all my point is, is actually, just the behaviour of the mixture is going to be in some way dependent upon the behaviour of the components of the mixture?

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17160. **DR. BRUCE HOLLEBONE:** I would put it better as the behaviour of the mixture is dependent on its composition.
17161. **MR. JANES:** All right.
17162. **DR. BRUCE HOLLEBONE:** And that composition is made up of a certain recipe of one thing and the other but you change that recipe and you may change the behaviour of the dilbit itself.
17163. **MR. JANES:** So, in any event, I think we can agree that -- just what you've said, is that in order to appreciate the question of whether the product sinks or floats depends upon -- and this is just one of the factors to be considered -- the actual composition of the product in question?
17164. **DR. BRUCE HOLLEBONE:** That's right.
17165. The make-up of the product in some ways is -- well, in more than some ways -- is very important to its behaviour.
17166. **MR. JANES:** Okay.
17167. And I'm going to suggest to you another -- and I'm going to come back to that in more detail in a moment -- but I'm going to suggest to you also that, in the sink versus float issue, there's also a question that has to be examined with respect to whether or not there are sediments or small particles in the water?
17168. **DR. BRUCE HOLLEBONE:** That can be a very important factor in the behaviour of the material, yes.
17169. **MR. JANES:** Right.
17170. So as I understand it, the issue is that you might have a product that would float in pure water, but in water containing small particles or sediments -- I guess we used to say small particles ---
17171. **DR. BRUCE HOLLEBONE:** M'hm.
17172. **MR. JANES:** --- you get a phenomenon where, effectively, you get adhesion between the hydrocarbon product and the small particle, and that

- changes its density effectively?
17173. **DR. BRUCE HOLLEBONE:** The resultant particle is a different density than the starting oil; yes, that's true.
17174. **MR. JANES:** Right.
17175. And I take it that that particular phenomenon seems to have played a role or had been observed to play a role with respect to dilbit in both the Kinder Morgan spill at Burnaby and the Enbridge spill at Kalamazoo.
17176. Is that correct?
17177. **DR. BRUCE HOLLEBONE:** Well, the -- I would say the two spills were very different.
17178. They were different products in both cases, although similar but they were both oil sands products. They were different products.
17179. The Kinder Morgan spill did not observe a lot of sediment aggregation in that spill. However, there was a significant amount of sediment association found in the Kalamazoo spill, yes.
17180. **MR. JANES:** Okay.
17181. So in terms of looking at Kalamazoo, we do see the sediment issue clearly playing a role there?
17182. **DR. BRUCE HOLLEBONE:** Yeah.
17183. **MR. JANES:** Okay.
17184. And just in terms of the reality of this situation around here -- and anybody out there in the panel can answer that depending upon their qualifications, I don't necessarily expect you, Dr. Hollebhone, to know the answer to this -- the waters around here given that you have both the Naas and Skeena Rivers as well as a number of other smaller rivers flowing into it, these are waters where you do expect to see sediments in the water in various places, small particles in the water in various places.

17185. Is that fair?

--- (A short pause/Courte pause)

17186. **MR. JANES:** Just to be clear, as I understand it, there's issues of glacial runoff for example will bring down sediment. You'll get -- also get runoff from smaller rivers and grounds feeding into the areas into the -- into the ocean.

17187. And, of course, then you'll different effects depending on where you are compared to the mouths of rivers.

17188. **DR. BRUCE HOLLEBONE:** The -- I think the best way we can put to that is that this was subject to several of our IR requests of the Proponent and some information has been provided by them.

17189. But I don't think we are satisfied that there's a complete data set been -- been given forth on this matter yet.

17190. **MR. JANES:** I just want to be clear about what your answer is meaning there because you say "this" and I'm not sure if the "this" is referring to the question of sediment causing the product to sink or the "this" is: Are there sediments in the water?

17191. **DR. BRUCE HOLLEBONE:** The environmental data, particularly -- are there sediments in the water?

17192. **MR. JANES:** Okay.

17193. But if we look ---

17194. **DR. BRUCE HOLLEBONE:** Or more particularly, what sediments are in the water?

17195. **MR. JANES:** Right.

17196. So if we break that down into -- into plausibility analysis, if you wish, when we look at the geography of this area and look at the fact that we at least have two big river systems that are fed, as I understand it, by glacial runoff that travel through the interior of British Columbia out to the ocean and we have a number of other rivers around here, this is the kind of area where, logically, you

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would expect to see runoff carrying small particulate matter; at least for some areas.

17197. Isn't that fair?

--- (A short pause/Courte pause)

17198. **MS. LAURA MACLEAN:** Thank you for your patience as -- as we confer.

17199. **MR. JANES:** There's no need to apologize. Take the time you need.

17200. **MS. LAURA MACLEAN:** I think, in a general sense, we would agree that high velocity river valleys tend to -- particularly in the freshet -- have a higher sediment load, suspended sediment concentrations and that in an estuarial environment it would be reasonable to expect that -- at least in certain times of year -- yes, you would -- you would have a sediment load entering the marine environment.

17201. That said, I think my colleagues have earlier referred to a request that the Department of Environment made for some specific baseline data on this issue and, to date, I don't think we're -- we're in receipt of a complete data set anyways.

17202. **MR. JANES:** And, actually, that's the next stage of my question which is just to make this very clear is the mere fact that it's possibility doesn't -- doesn't really tell you how and to what extent it happens and so you've asked for further information and that information has not been provided yet, in any event?

--- (A short pause/Courte pause)

17203. **MS. LAURA MACLEAN:** Yes, that's the case.

17204. **MR. JANES:** Dr. Hollebone, it's back to float versus sink again for a few minutes.

17205. Fundamentally, when we get into the question of float versus sink, this is really physics and chemistry, as I understand it, and it's the question of do you have a situation where one substance is more buoyant than the other substance.

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17206. Is that fair?
17207. **DR. BRUCE HOLLEBONE:** Yeah, it's often termed as specific gravity as the -- for oil versus -- or water versus something else.
17208. **MR. JANES:** Right.
17209. And I'm going to suggest to you there's a number of factors that go into that and we've talked about the question of what is the composition of the spilled hydrocarbon product.
17210. **DR. BRUCE HOLLEBONE:** M'hm.
17211. **MR. JANES:** That's one factor that has to be considered; correct?
17212. **DR. BRUCE HOLLEBONE:** Yeah, I mean the -- the composition relates to the physical properties.
17213. They're linked, they're -- you know as the composition changes so do the properties.
17214. **MR. JANES:** Right.
17215. And again, that actually ties to the sediment question we've just been talking about in the sense the addition of sediment changes the composition again so that may change the buoyancy.
17216. **DR. BRUCE HOLLEBONE:** I would agree, yes.
17217. **MR. JANES:** But another factor that has to be considered is the density of the water that it's in.
17218. **DR. BRUCE HOLLEBONE:** True.
17219. **MR. JANES:** And that's going to be tied, I'm going to suggest, to two factors as well the bitumen -- the dilbit as well if we're talking about dilbit. One factor that has to be considered there is temperature?
17220. **DR. BRUCE HOLLEBONE:** Yes.

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17221. **MR. JANES:** And salinity is also a factor.
17222. **DR. BRUCE HOLLEBONE:** Yes.
17223. **MR. JANES:** And as temperature changes, buoyancy changes.
17224. Is that fair?
17225. **DR. BRUCE HOLLEBONE:** Yes, it is.
17226. **MR. JANES:** And just to be clear, is that as I understand it what you see is that to break it into two pieces is that the density of one subject -- one substance may change at a different rate than the density of the other substance.
17227. **DR. BRUCE HOLLEBONE:** Yes.
17228. **MR. JANES:** So that if its temperature, for example, goes down you might see one -- one substance become more dense than it is at a higher temperature and, therefore, maybe buoyant at a higher temperature and less buoyant at a lower temperature.
17229. **DR. BRUCE HOLLEBONE:** That's correct.
17230. **MR. JANES:** And so when we're talking about issues such as: "Will a spilled hydrocarbon product float or not?", it does matter to identify what temperature at which you're assessing this question?
17231. **DR. BRUCE HOLLEBONE:** That's a very important parameter, yes.
17232. **MR. JANES:** And just when we're looking at this area, it -- let's be clear, first of all, it's going to be the water temperature that matters for this analysis and the bitumen analysis, not the air temperature.
17233. **DR. BRUCE HOLLEBONE:** Well, there are a number of factors that can contribute to oil temperature.
17234. Water is certainly very important. But solar heating can be an influence as well.

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17235. **MR. JANES:** Right.
17236. So when we're looking -- sorry, I maybe was a bit obscure in my question.
17237. Ultimately, whatever we're considering that causes the temperature of the oil and the water, it's going to be actually the temperatures of those substances that we have to look at, not the air temperature.
17238. **DR. BRUCE HOLLEBONE:** If you're considering the system of oil and water, will the oil float on the water, yes. That's the -- that's the thing that matters: the temperature of the two things.
17239. **MR. JANES:** And I'm going to suggest to you that if we're going to look at the question of: "Will a product -- a hydrocarbon product float or sink in this area, that is, out here in the -- the channels that are going to be used here or in Douglas Channel?", it's important that we look at the behaviour of the substances in question at temperatures that are actually typical for this area?
17240. Is that fair?
17241. **DR. BRUCE HOLLEBONE:** Yeah, I -- that is -- that is true.
17242. I will point out that it's sort of -- the policy of the work that we do particularly and others in our field is to look at generally a range of temperatures.
17243. **MR. JANES:** Right.
17244. **DR. BRUCE HOLLEBONE:** Often, it's not possible to estimate a specific temperature of a particular channel so we'll attempt to bracket that range and produce a low temperature and a high temperature that we can then interpolate between.
17245. **MR. JANES:** And actually ---
17246. **DR. BRUCE HOLLEBONE:** Or several.
17247. **MR. JANES:** Yeah, so actually -- obviously, from -- through the seasons you'll get different water temperatures in this area; correct?

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17248. **DR. BRUCE HOLLEBONE:** I'm not an expert on that but I would assume so.
17249. **MR. JANES:** I think we can bank on the fact that there's winter and summer here like in other parts of Canada.
17250. **DR. BRUCE HOLLEBONE:** Yes.
17251. **MR. JANES:** And that, of course, will affect how the oil or the hydrocarbon product may behave if spilled at different seasons of the year.
17252. **DR. BRUCE HOLLEBONE:** Certainly, the -- the temperature and the -- particularly the weather will strongly influence that, yeah.
17253. **MR. JANES:** Right.
17254. And in terms, I'm going to suggest, of good scientific practice, you would actually want to look at the question of buoyancy -- sink versus float -- looking at, as you've suggested, a variety of different temperatures that are relevant to the area in question.
17255. **DR. BRUCE HOLLEBONE:** As I indicated earlier, our practice within our own laboratory is to do exactly that, is to look at a range of temperatures so that they can be applicable to a fairly wide range of environmental conditions.
17256. **MR. JANES:** And I suggest also that you would also want to look at a range of water compositions that are relevant to the area in question.
17257. **DR. BRUCE HOLLEBONE:** Again, a similar technique is used where we'll look at sort of end number with some intermediates of -- so full salt, full fresh with brackish in the middle or something.
17258. **MR. JANES:** And let me just talk about this issue of full salt versus full fresh. I mean when we look out here, to the lay eye it just looks like a big body of uniform water. But I take it particularly around river mouths and in the areas leading out from river mouths, you actually see a mix of salt and freshwater?
17259. **DR. BRUCE HOLLEBONE:** It's true. Estuarine water is often what

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we would term brackish, intermediate between salt and fresh.

17260. **MR. JANES:** And so actually you'd probably see a gradation in saltiness as you went from surface down; is that fair?
17261. **DR. BRUCE HOLLEBONE:** That actually is a fairly complicated question that I don't feel particularly able to answer. That's something maybe Ali or some of the other oceanographers here may want to talk about.
17262. **DR. ALI KHELIFA:** Are you referring to stratification?
17263. **MR. JANES:** Yes.
17264. **DR. ALI KHELIFA:** Yes, it may be.
17265. **MR. JANES:** Right.
17266. **DR. ALI KHELIFA:** But you have to keep in mind the water depth.
17267. **MR. JANES:** Right. It -- so maybe the best way to say is that it's not a straightforward matter to move from a test run in freshwater at 15 degrees to a test run in salt or brackish water at 5 degrees or at zero degrees. Is that fair?
17268. **DR. BRUCE HOLLEBONE:** Those I would regard as fairly different conditions.
17269. **MR. JANES:** And so an important question in moving from an in-lab experiment to what will happen out here in an actual body of water if a spill occurs, is an analysis that requires really digging into how comparable are the circumstances in the lab compared to the circumstances in nature; is that fair?
17270. **DR. BRUCE HOLLEBONE:** Let me just back up from that a little bit and sort of give you a bit more context.
17271. This is something that the entire -- anytime you're doing simulations within a laboratory, this is one of the big problems you have, is how do you relate what you do in the lab or in a test tank or something of that nature, to what actually occurs in reality? And it requires -- it's usually a multi-step process of calibrating your results versus what is observed both in real spills. So we do measurements at -- what we call measurements of opportunity at real spills or

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- versus controlled experiments and some sort of progressively more realistic version of the environment, a test tank to maybe doing simulants in a real beach, as has been done in the past.
17272. So yes, it takes a lot of careful thought to make that link between what happens in a laboratory flask and what would happen on a real beach.
17273. **MR. JANES:** Right.
17274. **DR. BRUCE HOLLEBONE:** Or out in the open ocean.
17275. **MR. JANES:** Right. And in going back to your -- to the evidence that's contained in the materials filed by Canada, I'm going to suggest that this has been alluded to in terms of the expectation -- I can't, unfortunately, remember if it's Environment Canada, Department of Fisheries Ocean or both, is that in fact, you would like to see a broader range of experiments or of results that show how different types of products behave in different types of water at different types of temperature. Is that fair?
17276. **DR. BRUCE HOLLEBONE:** I don't know if those specific comments were made in our written evidence. However, there were a number of questions relating to matters such as that where we were looking for particularly more explanation of what the products to be shipped were, the range of variability within those products. And to also look at some of the other parameters that have just been mentioned.
17277. **MR. JANES:** You're off the hook, ---
17278. **DR. BRUCE HOLLEBONE:** Okay.
17279. **MR. JANES:** --- Dr. Hollebhone.
17280. I actually just have one series of questions to ask and this really -- actually, maybe I should just ask this question before I even start down this road. Has anybody on the panel had to work through human subject research protocols before? And the protocols that are expected around studies that involve actual interaction with human beings and issues like that?
17281. And this is pertinent just to give you kind of -- this is pertinent to the question of carrying out traditional use studies in order to assess significance of

impacts.

--- (No response/Aucune réponse)

17282. **MR. JANES:** It looks like a resounding no.

17283. **DR. CAROLINE CAZA:** I think we would say no.

17284. **MR. JANES:** Okay.

17285. **DR. CAROLINE CAZA:** We have three folks on the phone however, who may ---

17286. **MR. JANES:** Oh.

17287. **DR. CAROLINE CAZA:** --- need to be able to say “yes” or “no” as well, because ---

17288. **MR. JANES:** So the folks out there in telephone land, have any of you had to deal with issues around the protocols that apply to human subject studies?

17289. **DR. CARL BROWN:** It’s Carl Brown.

17290. That’s a “no” for me.

17291. **DR. XUEBIN ZHANG:** It’s Xuebin Zhang.

17292. No, we don’t do that kind of things.

17293. **MR. RICHARD HOLT:** And it’s Richard Holt and I -- “no”, as well.

17294. **MR. JANES:** Okay. If I could just have a few moments to go through my notes, I may very well be able to -- I may be finished.

--- (A short pause/Courte pause)

17295. **MR. JANES:** There is one factual issue that I have to deal with. If somebody could bring up Dr. Short’s reply evidence which is Exhibit D72-80-2. And let me get the exact page I want to go to. Oh, if you could turn to page --

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PDF page 17 of 24. Sorry, just go up -- and sorry, when I say "up", I mean the other direction towards the top of the page -- and then further -- it may be -- I'm looking for Table 1. Sorry, continue -- okay, just pause there.

17296. Dr. Hollebhone, these numbers are said to come from a personal communication in the form of two emails from you. Have you seen these numbers and can you verify that these reflect the numbers that you provided?
17297. **DR. BRUCE HOLLEBONE:** Yeah, first just let me state for the Panel's benefit that these numbers are actually in evidence, although Dr. Short did not refer to them that way.
17298. This is actually in E9-2-1 of August 2011, which was the first IR that we put in as Environment Canada, and this is Appendix C.
17299. **MR. JANES:** Okay.
17300. **DR. BRUCE HOLLEBONE:** These are taken from Appendix C. So this evidence has been filed previously with the Panel prior to my communication with Dr. Short.
17301. **MR. JANES:** Okay. Well, that's actually all I need to know then.
17302. **DR. BRUCE HOLLEBONE:** Okay.
17303. **MR. JANES:** Those are my questions. Actually, maybe I should check with Ms. Mathers before she tells you that I've forgotten something crucial here.
17304. We're done.
17305. **THE CHAIRPERSON:** Thank you very much, Mr. Janes.
17306. **MR. JANES:** Thank you very much, ladies and gentlemen.
17307. Oh wait, Dr. Caza wants to add something. It seems I -- she may have been anticipating another question from me somewhere along the road.
17308. **DR. CAROLINE CAZA:** Madam Chair, I don't know if it would be helpful but a question was asked by Mr. Janes earlier about the effects of the

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- persistence of the effects from oil spills on a marine biota and wildlife.
17309. And I know our colleagues from DFO answered that question with respect to whales but we do have Dr. Esler with us who has a lot experience, I believe, also with the Exxon Valdez spill, in that area. And if the Panel would be interested in additional comments by him on that particular point, we just would like to make him available to provide that information.
17310. **MR. JANES:** May I speak to the Panel for a moment? Given that this has been raised now and given that Enbridge is going to be asking questions, I would actually prefer to hear the answer to that now rather than to hear it later when I'll no longer be able to ask questions about it.
17311. So given that the offer has been proffered, and I sort of dread what may come, the -- we may as well hear it now rather than hear it later.
17312. **THE CHAIRPERSON:** Let's have the witness proceed.
17313. **DR. DAN ESLER:** Well, my experience with the Exxon Valdez is largely related to marine birds and effects on marine bird populations. I'm not sure I necessarily have additional information to add at this point but I want to make myself available to answer questions you may have specifically to marine birds or follow-ups on questions about residual oil or effects on marine mammals or other intertidal life.
17314. **MR. JANES:** As a lawyer, I can tell you that I generally don't go fishing where I have no idea what the answer is actually going to be so I don't have any further questions.
17315. **THE CHAIRPERSON:** Thank you very much, Mr. Janes. So we'll conclude with your questions and call the Haisla Nation.
17316. Let's take our afternoon break now and come back for 20 to 3:00, please. Thank you.
- Upon recessing at 2:25 p.m./L'audience est suspendue à 14h25
--- Upon resuming at 2:38 p.m./L'audience est reprise à 14h38
17317. **THE CHAIRPERSON:** If we could get everyone to take their seats,

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please, we'll get ready to get underway.

--- (A short pause/Courte pause)

17318. **THE CHAIRPERSON:** Thank you, everyone.

17319. Good afternoon, Mr. McCormick, representing the Haisla Nation?

17320. **MR. McCORMICK:** I still am. Good afternoon.

17321. **THE CHAIRPERSON:** Still am? That's good. That's good.

17322. Please proceed with your questions with your questions of this Panel.

17323. **MR. McCORMICK:** Thank you, Madame Chair.

17324. **MR. PATTERSON:** Excuse me, Madam Chairman?

17325. We do have one prelim matter to just throw in, if we could?

17326. **THE CHAIRPERSON:** Sorry, Mr. Patterson. I didn't see you. It's hard to see which red light is lit up in this circle right now.

17327. **MR. PATTERSON:** Anyway, we just wanted to advise you that we just received a message from the Kitimat Valley Naturalists and they've decided to withdraw their name from the current Government witness panel list. So they won't be here asking questions on this Panel at all.

17328. **THE CHAIRPERSON:** Thank you for the update, Mr. Patterson.

17329. **MR. PATTERSON:** Thank you.

--- (A short pause/Courte pause)

17330. **THE CHAIRPERSON:** Mr. McCormick, please proceed.

BONNIE ANTCLIFFE: Resumed

MICHAEL ENGELSJORD: Resumed

BRAD FANOS: Resumed

JOHN FORD: Resumed

STEVEN GROVES: Resumed
THOMAS KING: Resumed
TRACEY SANDGATHE: Resumed
CAROLINE CAZA: Resumed
SEAN BOYD: Resumed
CARL BROWN: Resumed
CORAL deSHIELD: Resumed
CHRIS DOYLE: Resumed
DAN ESLER: Resumed
GRANT HOGG: Resumed
BRUCE HOLLEBONE: Resumed
RICHARD HOLT: Resumed
ALI KHELIFA: Resumed
LAURA MACLEAN: Resumed
KEN MORGAN: Resumed
PATRICK O'HARA: Resumed
BARRY SMITH: Resumed
JENNIFER WILSON: Resumed
XUEBIN ZHANG: Resumed
JOHN CLARKE: Resumed
HEATHER DETTMAN: Resumed

--- EXAMINATION BY/INTERROGATOIRE PAR MR. McCORMICK:

17331. **MR. McCORMICK:** Thank you, Madame Chair.

17332. Good afternoon, Members of the Panel, NEB staff. Witnesses, my name is Jesse McCormick. I am counsel to the Haisla Nation. I am joined today by Astrid Jacobson, immediately to my right and, to her right, Gillian Bakker who provide technical services to the Haisla Nation.

17333. I just have some questions for you and we're looking forward to the discussions.

17334. Madame Clerk, if we could please see displayed on the screen Exhibit E9-21-09 and page 58? Thank you.

17335. So this was a response given by DFO to a request from Gitxaala -- this is on page 51 of this document -- and we see DFO's -- well, the question was:

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“On what basis was the determination made that the Proponent has conducted a reasonable assessment of the risk that an oil spill would pose to fisheries resources in freshwater and marine environments?”

17336. And we see here on the screen, in Section 1.8.1.1, the response. If you could just take a moment to review that?

--- (A short pause/Courte pause)

17337. **THE CHAIRPERSON:** Mr. McCormick, could you clarify what page you'd like us to be on?

17338. **MR. McCORMICK:** Certainly.

17339. I have page 58 here in my notes but the referenced paragraph is 1.8.1.1. My apologies if I've miss-noted the page number.

17340. **THE CHAIRPERSON:** Is it 1.8.11 or is it really 1.8.1?

17341. Because that's quite a bit of a change.

17342. **MR. McCORMICK:** M'hm. It is .1.1.

17343. Thank you, Madame Clerk.

17344. **THE CHAIRPERSON:** And do you have a page reference for that?

17345. **MR. McCORMICK:** I'm afraid I don't. I've miss-noted it. My apologies, Madame.

17346. **THE CHAIRPERSON:** Is this what you were looking for, Mr. McCormick?

17347. **MR. McCORMICK:** That is correct.

17348. We see on the screen the question 1.8.1.1 and it would be the response that we're hoping to find. So it would be the next point where that number occurs.

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17349. Thank you, Ms. Niro. So we see here, on page 58, the response to the question that was posed. I'll direct the witness panel to the first sentence of paragraph 1.8.1.1 indicating that:

"...water quality and toxicology [were] [...] outside the Department's regulatory expertise."

17350. As DFO does not have expertise with respect to impacts on water quality and toxicology, can it adequately assess potential impacts to fish and fish habitat in the event of a spill?

--- (A short pause/Courte pause)

17351. **MS. BONNIE ANTCLIFFE:** Could we ask you to repeat the question so we can make sure we can answer the question we understand exactly what it is you're asking?

17352. **MR. McCORMICK:** Certainly, Ms. Antcliffe.

17353. As DFO states here that it does not have the expertise with respect to impacts on water quality and toxicology, can DFO adequately assess potential impacts to fish and fish habitat in the event of an oil spill?

--- (A short pause/Courte pause)

17354. **MR. MICHAEL ENGELSJORD:** Hi, it's Mike Engelsjord. Maybe I'll try to answer that if I understand it correctly.

17355. In the simplest sense, it's not what we do. We do support -- in the event that there was an accidental spill, there's somebody who's in charge of directing the clean-up and there's a mechanism through -- that DFO and other holders of information in the government can ensure that that information is before the entity that's making decisions in terms of cleaning up a spill.

17356. **MR. McCORMICK:** And who within the Federal Government would have the expertise on water quality and toxicology?

17357. **MS. LAURA MACLEAN:** Good afternoon, Laura Maclean, with Environment Canada.

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17358. So as we have discussed in Prince George, Environment Canada does have the responsibilities for administration of what we refer to as the “pollution prevention provisions” of the *Federal Fisheries Act* at Section 36 and so some of those activities are carried out by our Department.

17359. **MR. McCORMICK:** Thank you.

17360. **MS. BONNIE ANTCLIFFE:** It’s Bonnie Antcliffe here from DFO.

17361. I will just add where DFO would have scientific expertise related to this matter, we would provide that scientific expertise to be available to those regulatory agencies who should need it.

17362. **MR. McCORMICK:** Thank you.

17363. If we could look to the second sentence of the same paragraph, it indicates that DFO’s considerations were based on Northern Gateway’s information and Fisheries and Oceans Canada’s habitat risk management framework.

17364. Am I correct in my understanding that, when making the assessment that DFO did of the application, it was relying solely on the information provided by the Proponent to determine whether the information the Proponent provided was sufficient?

17365. **MR. MICHAEL ENGELSJORD:** That’s correct. Our staff did do a certain degree of field visits. I don’t know you were here this morning, we discussed those.

17366. **MR. McCORMICK:** And DFO has made recommendations to Northern Gateway regarding the provision of additional information to support the evaluation of the project.

17367. Has DFO confirmed whether or not all of the recommendations have been satisfied and all of the recommended information has been provided for Panel consideration?

--- (A short pause/Courte pause)

17368. **MR. MICHAEL ENGELSJORD:** So for some of our

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recommendations, the Proponent has followed up with further material and in some cases their follow-up has been a commitment to develop whatever the request was at a later date.

17369. **MR. McCORMICK:** Are there any recommendations that the Proponent has not yet satisfied?
17370. **MR. MICHAEL ENGELSJORD:** I don't believe there's any that they haven't responded to.
17371. **MR. McCORMICK:** Has Northern Gateway fulfilled all of DFO's recommendations for information relating to eulachon?
17372. **MS. TRACEY SANDGATHE:** Northern Gateway has made a commitment to do some further work during the period after the environmental assessment and prior to operations, and that's found in its Marine Environmental Effects Monitoring Plan and, specifically, they refer to eulachon.
17373. **MR. McCORMICK:** Thank you.
17374. Has DFO established the pathways of effects relating to oil spills in the marine environment?
17375. **MR. MICHAEL ENGELSJORD:** DFO hasn't conducted a review of effects of oil spills in the environment.
17376. **MR. McCORMICK:** Has DFO conducted an assessment to determine whether the information provided by Northern Gateway is both sufficient and accurate enough to adequately assess the risks to fish and fish habitat in the event of a spill?
17377. **MS. BONNIE ANTCLIFFE:** So with respect to that question, an important component of the environmental effects piece would be understanding the fate and behaviour of the products, and we've heard from Environment Canada with respect to recommendations for further work in that regard.
17378. **MR. McCORMICK:** Thank you.
17379. Perhaps I can help to clarify the question. The question goes to the issue of whether the information that's been provided by Northern Gateway to

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date is both sufficient and accurate in the eyes of DFO to serve as the basis for determining or assessing the risks to fish and fish habitat in the event of a spill?

--- (A short pause/Courte pause)

17380. **MS. BONNIE ANTCLIFFE:** So thank you for your patience.

17381. With respect to the information conducted by the Proponent for the environmental assessment purposes, DFO has not reviewed that information, but we think that what we have on the environmental effects side is a good starting point for the environmental assessment.

17382. We did, again, note that with respect to the fate and behaviour that there are deficiencies noted by Environment Canada.

17383. **MR. McCORMICK:** Has DFO sought the advice of other government departments or agencies regarding the accuracy of spill modelling and fate and behaviour information provided by Northern Gateway?

17384. **MR. MICHAEL ENGELSJORD:** No, we didn't.

17385. **MR. McCORMICK:** Thank you.

17386. Do the responsible agencies -- DFO, Environment Canada, Transport Canada -- have a scientifically reliable understanding of the pathways of effects for spills in the marine environment for the specific products to be shipped by Northern Gateway?

17387. **MR. THOMAS KING:** This is Tom King.

17388. We -- that's actually new research that will be ongoing in the future. We have done a lot of research in collaboration with university on effects, biological effects, namely with academia.

17389. **MR. McCORMICK:** Thank you, Mr. King.

17390. And was that new research related specifically to the products that Northern Gateway intends to ship as part of the Northern Gateway Project?

17391. **MR. THOMAS KING:** No. These were conventional oil products.

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17392. **MR. McCORMICK:** Would you agree that what may be true for conventional oil products may not be true for diluted bitumen in relation to biological effects?
17393. **MR. THOMAS KING:** Yes.
17394. **MR. McCORMICK:** Madame Clerk, could we please see displayed Exhibit E9-21-08, page 39? Thank you.
17395. This is DFO's response to the Gitga'at First Nation IR Number 1, Question 4.1a) which requested information on the pathways of effects for certain species in the project area, including eulachon and herring. Just take a brief moment to review the question itself, 4.1a).
17396. Then if we could please go to page 40, Madame Clerk?
17397. We can see that -- oh, I'm sorry, we may have to go up a page, a little further. Thank you.
17398. I've misdirected. Madame Clerk, could we please go down on the page? Thank you, there we are.
17399. So what we see here is that DFO states at the end of the first paragraph that in the absence of further research and study, DFO is not in a position to provide quantitative responses regarding impacts to the Gitga'at question as posed on July 6th, 2012. It also notes the need for raw data.
17400. Was DFO provided with access to the raw data from Northern Gateway referenced in the response to Gitga'at?
17401. **MR. MICHAEL ENGELSJORD:** No, I don't believe so.
17402. **MR. McCORMICK:** Thank you.
17403. Has DFO identified priority areas for study in relation to acute and sublethal effects to species in the project area?
17404. **MR. MICHAEL ENGELSJORD:** If we understand the question correctly, then the answer is no.

--- (A short pause/Courte pause)

17405. **MR. McCORMICK:** Does DFO intend to further study acute and sublethal effects to species in the project area?
17406. **MR. THOMAS KING:** This is Tom King.
17407. DFO has set up an advisory committee that will actually address these issues and most of this research would probably -- most likely be conducted outside of DFO, but we will have a budget in place to support like academia, graduate students and stuff to do that type of work.
17408. **MR. McCORMICK:** And am I correct in my understanding that that research won't be completed and will not be available to assist in the decision-making relating to these proceedings?
17409. **MR. THOMAS KING:** That is correct. But we also have to point out we have to look at things like the fate and behaviour of the components in the water phase that goes back to this whole issue that our colleagues at Environment Canada spoke about earlier, whether it floats or sinks. We need to have an understanding of that first before we can then actually determine the effects that it may have on particular species of fish.
17410. **MR. McCORMICK:** And am I correct to understand, Mr. King, that that understanding isn't -- DFO doesn't currently have that understanding. It will be necessary to complete further studies before that understanding is achieved and then the effects can be assessed; is that correct?
17411. **MR. THOMAS KING:** That's correct.
17412. **MR. McCORMICK:** Madame Clerk, could we please see page 45? If we could scroll down to the third paragraph under the subheading "Conclusions" beginning with:

"Fisheries and Oceans Canada's Science Branch cannot at this time quantify the magnitude and duration of impacts to individuals, populations, and habitats for all of these marine resources in the CCAA and OWA in the event of a spill."

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17413. Is it still the opinion of DFO at this time that it is not in a position to quantify the magnitude and duration of impacts for marine resources in the CCAA and OWA in the event of a spill?
17414. **MR. THOMAS KING:** We don't have that information to make a decision on that.
17415. **MR. McCORMICK:** Will DFO be relying on information to be gathered by the Proponent as part of the marine environmental effects monitoring program to fill in the information gaps regarding pathways of effects, acute and sublethal effects within the CCAA and OWA?
17416. **MR. THOMAS KING:** DFO will be conducting research with our colleagues in Environment Canada on fate and behaviour of these products. In addition, any environmental effects programs that are put in place by the Proponent will also be taken into consideration.
17417. **MR. McCORMICK:** Now, it's my understanding that the word "effects" has a precise and scientific meaning in the context of an environmental monitoring plan; is that correct?
17418. **MR. MICHAEL ENGELSJORD:** Could I get you to repeat that question?
17419. **MR. McCORMICK:** Certainly. The word "effects" in the context of an environmental monitoring plan, it's my understanding that that has a precise and scientific meaning; is that correct?
17420. **MR. MICHAEL ENGELSJORD:** I'm not aware that it's a scientifically defined thing, but a good environmental effects monitoring plan would define those effects well.
17421. **MR. McCORMICK:** Thank you.
17422. And is there a difference between a biological baseline study and an environmental effects monitoring plan?
17423. **MR. MICHAEL ENGELSJORD:** Yes, the baseline study is a description of the existing environment whereas the environmental effects monitoring plan is a plan to monitor -- excuse me, the -- the effect of a proposed

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- activity on the environment.
17424. **MR. McCORMICK:** Thank you.
17425. To touch briefly on the framework for the marine environmental effects monitoring plan. Environment Canada has commented on the Marine EEMP in its written evidence. Just take a brief look at the marine EEMP to help to better understand the comments that Environment Canada has made.
17426. Madame Clerk, could we please see Exhibit B46-38, page 7.
17427. **THE CHAIRPERSON:** Mr. McCormick, could you clarify the exhibit number you're looking for please?
17428. **MR. McCORMICK:** I have here B46-38.
17429. Thank you. And it would be page 7. Thank you.
17430. So if we could please note the first sentence of the second paragraph, beginning with: "Measurable parameters..."
17431. Would you agree that an examination limited to the water column, seafloor sediments, and biological communities would not provide sufficient information to fully assess and evaluate project-related effects?
- (A short pause/Courte pause)
17432. **MS. LAURA MACLEAN:** Again, thanks for your indulgence while we talked with our colleagues.
17433. I think in terms of potential biophysical effects, in a general sense, the parameters that are identified here would appear to be reasonable.
17434. **MR. McCORMICK:** And Madame Clerk, could we please see Exhibit E9-6-32? Thank you, and if we could take a look at page 84?
17435. So this is from Environment Canada's written evidence. Oh, I'm sorry; we should be on page 85. We're looking for paragraph 250. Thank you, Ms. Niro.

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17436. Under paragraph 250, Environment Canada specifically refers to the marine environmental effects monitoring program as a baseline studies rather than as an environmental effects monitoring plan and suggests that while it forms "...a good foundation for the development of a rigorous monitoring" plan, they recommend that Northern Gateway should refer to other studies to help them develop the parameters of their own program.

17437. In the opinion of Environment Canada, is the draft framework of Northern Gateway for the marine environmental effects monitoring program, as it is set out, directed more towards a baseline study or in effects monitoring plan?

17438. **MS. LAURA MACLEAN:** So I'll start by just being very clear that Environment Canada, in considering the framework for the marine environmental effects monitoring, as put forward by Northern Gateway, looked very explicitly at the marine bird component of that and not at some of the other biophysical parameters that you touched on in your preamble to this question.

17439. With that, I will ask some of our Canadian Wildlife Service colleagues to assist you with a more detailed answer.

17440. **DR. BARRY SMITH:** It's Barry Smith; so I'll start.

17441. So what we asked for and you may recall this from the evidence was three years of baseline study prior to the EA being complete three years later should the project be approved. That's in our view a considerable amount of baseline data, of six years of data. We don't often get that for a project. And our intent is to help guide the Proponent moving forward with our advice as to what would be appropriate to get high quality data to inform a baseline.

17442. So the fundamental answer to your question is that it is intended to be a baseline to have a good understanding of what the marine bird values are within the project area.

17443. **MR. McCORMICK:** Now, we see here a referenced study by Coletti. Am I correct in my understanding that the Coletti study includes measurements for concentration of contaminants?

17444. **DR. DAN ESLER:** This is Dan Esler.

17445. And yes, that study does include measurement of hydrocarbons.

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17446. **MR. McCORMICK:** Thank you.
17447. And would you agree that sublethal toxicity testing and chemical analyses of potential sources of pollution from the project are important elements of understanding in assessing project-related biological effects?
17448. **DR. DAN ESLER:** In the context of advice to Enbridge Northern Gateway with regard to development of a monitoring plan, Environment Canada did have a series of attributes that would be recommended for measurement, including measurement of contamination in the environment.
17449. **MR. McCORMICK:** And would that measurement of contamination in the environment in relation to biological effects include assessment of sublethal toxicity?
17450. **DR. DAN ESLER:** One of the recommendations was to include measurements of exposure to some specific vertebrates, particularly some marine birds that have been shown in previous studies that I've conducted and others have conducted that indicate exposure to hydrocarbons in the environment.
17451. It doesn't necessarily measure effects. Exposure doesn't necessarily mean that there's an effect on individuals or populations, but it does measure the presence of hydrocarbons that are bioavailable for vertebrates in that environment.
17452. **MR. McCORMICK:** Is the exclusion of specific recommendations relating to sublethal toxicity testing an indication from Environment Canada that sublethal toxicity testing should not be conducted for the project?
17453. **MS. LAURA MACLEAN:** No, I don't think that we would agree with that statement. I think again it might be helpful to step back a little bit and further provide some context around the terminology around environmental effects.
17454. And so, as you've heard through some previous testimony, Environment Canada has focused its efforts in this area in making recommendations to improve the state of science in terms of the behaviour and the fate of the products that would be shipped, and we've discussed those at length, I believe, in these proceedings.

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17455. We have then gone on and examined the Proponent's approach to spill modelling where we try and then understand the confidence within which we could predict where the products might go in the environment if they were to be spilled.
17456. Only once we have a reasonably good handle on those two pieces of work does it become possible to consider in an in-depth way anyways the likely or potential exposures of different species, different specific areas of the environment. And then only once you have a handle on the exposures can you start to understand it in detail the likely or potential effects, biological effects, be they sublethal or acute.
17457. So it's sort of a cascading series of types of science that need to be applied to drive at the question that I think you are asking.
17458. So Environment Canada, for its part, has made some substantial investments in understanding and providing commentary and advice to the Joint Review Panel Members on those first two. And certainly there is information in the literature and we've seen that referenced in these proceedings as well about the potential acute effects, but it becomes very -- sublethal effects as well, I should say. It becomes very difficult to start with that question, so you sort of have to back up to the others in order to get there.
17459. I don't know if that's helpful.
17460. **MR. McCORMICK:** No, that's very helpful and maybe I can reiterate to make sure I've captured properly what you've explained.
17461. So first, you'd have to look at fate and behaviour. Once you have, I believe, a reasonably good handle on fate and behaviour then you can start to look at likely or potential exposures. And then once you've got an idea of the likely or potential exposures you can get into the more detailed analysis relating to biological effects such as sublethal toxicity. Is that a fair statement?
17462. **MS. LAURA MACLEAN:** I think you've captured it quite -- quite well.
17463. And I might add to that that it doesn't mean that some of that work could not be done concurrently because some of it certainly could be conducted

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- under the auspices of a Science Advisory Committee that Environment Canada has recommended.
17464. We haven't drawn any boundaries around what might be recommended by the panel of experts that could be convened as part of that committee. So it's conceivable that research into toxicology could be conducted in parallel with some of the other studies.
17465. **MR. McCORMICK:** Thank you.
17466. And the -- just to appreciate the fate and behaviour aspect, I believe you noted it would be necessary to have a reasonably good handle on the fate and behaviour before digging into some of these other areas we've discussed.
17467. In the opinion of Environment Canada is there currently a reasonably good handle or reasonably good understanding of fate and behaviour in relation to the specific products that will be transported by Northern Gateway?
17468. **MS. LAURA MACLEAN:** So I'll pass that question to my colleague, Dr. Hollebhone, who may be best positioned to provide you with an answer.
17469. **DR. BRUCE HOLLEBONE:** Yeah, so I think you'll find the best detailed answer to that in our evidence.
17470. We've outlined in our recommendations several areas where we feel additional information is needed, including certain behaviour changes like evaporation or emulsification, sedimentation -- possible sedimentation and other behaviours that could -- could happen in the environment in that -- in those -- in that series of recommendations 2-1 to 2-8 I believe.
17471. **MR. McCORMICK:** Thank you, Dr. Hollebhone.
17472. In relation to -- returning briefly to the marine environmental effects monitoring program, would DFO or Environment Canada recommend that Northern Gateway include, as part of its assessment, the development of ecological sensitivity maps showing the distributions, concentrations and periods of greatest vulnerability to a spill for marine species in the project area?
17473. **DR. CAROLINE CAZA:** Excuse me, Mr. McCormick, could you

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just repeat that question for us?

17474. **MR. McCORMICK:** Certainly, Dr. Caza.

17475. So referring to both Environment Canada or the DFO and in reference to the marine environmental effects monitoring program, the framework which Northern Gateway has laid out would the DFO or Environment Canada recommend that include -- recommend that Northern Gateway include within that framework the development of ecological sensitivity maps showing distributions, concentrations in periods of greatest vulnerability to a spill for marine species in the project area?

--- (A short pause/Courte pause)

17476. **DR. BARRY SMITH:** Hello, it's Barry Smith here.

17477. And I'll give you an answer to that question. But before I do I just want to correct for the record what I said earlier. I said I think it was three years of monitoring would be done pre-EA and three years after. I misspoke, I should have said three years prior to construction and three years afterwards.

17478. And just to continue along that theme I mean one of the purposes of us encouraging Enbridge to do that kind of work is exactly to identify areas that are of ecological importance where the birds are found, where they might be found in concentration, and as well according to season.

17479. But as part of our mandate we do this type of work somewhat routinely. So Environment Canada has -- the Canadian Wildlife Service of Environment Canada has known areas of importance for birds. So for example even in the current world if there were oil spills we would be able to provide advice as to where those important areas would be.

17480. We also have information, for example, on important estuaries as well. So what this work would be doing would be supplementing some of our ongoing work. But obviously it would be done in a more intense way by Enbridge to inform specifically what the potential impacts of their project might be should there be an oil spill.

17481. And then we would evaluate that in part in the context of the type of information we collect as part of our ongoing execution of our mandate to protect

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- migratory birds.
17482. **MR. McCORMICK:** Thank you, Dr. Smith.
17483. The Proponent has used, rather extensively through their application, the use of key indicator species to assess potential effects of the project.
17484. Does the witness panel endorse the use of key indicator species as an appropriate methodology for assessing effects across the broad range of species present in the CCAA and OWA?
17485. **MS. CORAL deSHIELD:** It's Coral deShield.
17486. I'll just say generally certainly it's an approach that can be used. The key thing is to make sure that you're using appropriate species that -- that are representative.
17487. **MR. McCORMICK:** Thank you, Ms. deShield. Or perhaps, am I -- is it Ms. deShield or is it Ms. Coral deShield?
17488. **MS. CORAL deSHIELD:** Coral deShield.
17489. **MR. McCORMICK:** Thank you.
17490. And just so I'm clear walking away, in asking whether the witness panel endorses that I understand that it is a possible means of conducting an assessment, does the witness panel endorse the use of key indicator species as an appropriate and effective and reliable method of assessing the effects across a broad range of species?
17491. **MS. JENNIFER WILSON:** Hi, this is Jennifer Wilson.
17492. So in Environment Canada's written evidence we had some recommendations that the -- the indicator species that were selected for the Kitimat Terminal, the marine transportation and the marine spills might not be fully representative of the -- of the guilds of the species that are present in those areas and instead had recommended a more thorough community of species approach.
17493. **MR. McCORMICK:** Thank you, Ms. Wilson.

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17494. And to help me understand, in having indicated that the key indicator species which have been selected may not be fully representative, what are the potential implications for the assessment of effects if you have based your assessment on a set of species which are not fully representative?

17495. **MS. JENNIFER WILSON:** Well, just kind of generically we'd say that if the indicator species that were selected weren't appropriate, then some of the potential impacts arising from the -- from either the routine operations or in the case of an accidental release, that the impacts might not be -- the representative species might not be -- might not actually show the actual impacts that might be seen on the other species.

17496. **MR. McCORMICK:** Thank you, Ms. Wilson.

17497. Madame Clerk, could we please see displayed on the screen Haisla Nation aid to cross-examination number 4, "Spring Report of the Commissioner of the Environment and Sustainable Development"?

17498. And if we could please go to page 28?

17499. Has the witness panel had the opportunity to review the highlighted portions of this document? And I see heads nodding. Thank you.

17500. And if I could please direct the attention of the witness panel to 1.90? It's a little lower on the page. Thank you, Ms. Niro.

17501. So we see some critiques, criticisms, evaluation for the Commissioner of the Environment and Sustainable Development relating to ensuring compliance with the *Fisheries Act*.

17502. Since this report was released, how has Environment Canada dealt with the lack of stated clear priorities, difficulties in determining compliance with the *Fisheries Act* and inconsistent responses across regions and sectors?

17503. **DR. CAROLINE CAZA:** Since the report was released, the Department has done a number of things to follow up on the commitments that it made in response to the recommendations.

17504. And in addition to that, opportunities that have arisen in the last year

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or so to make some revisions to the *Fisheries Act* itself have -- I think will help the Department in clarifying its role and mandate with respect to the *Fisheries Act* implementation.

17505. So among the specific things that have been done, the Department has developed a results management framework for its *Fisheries Act* obligations and that framework identifies the expected outcomes and objectives and outputs the Department -- that the Department is seeking to achieve with the administration of Section 36 and that will help with the issue of accountability and establishment of priorities.
17506. It has created a clear focal point within the Department, within a division called the "Forestry and Fisheries Act Division" that is responsible for the coordination and leadership and guidance on *Fisheries Act* implementation within the Department.
17507. It has, through the activities of the enforcement branch and the compliance program in the Department, established a national compliance and enforcement policy that clarifies how the Department approaches the implementation of its responsibilities with respect to compliance and enforcement of the *Fisheries Act*.
17508. And lastly, I would point to the amendments to *Fisheries Act* that will allow the Minister of Environment to be officially designated as having the legislative authority for implementing parts of Section 36.3 which is one of the act -- which is one of the changes brought through under the Responsible Resource Development Initiative -- Bill C-38, I believe -- and that will clarify the ministerial accountability for the *Fisheries Act* and also amendments that will allow the Minister -- give the Minister a broader range of tools for managing the -- managing activities underneath the Act, through the establishment -- potential establishment of regulations that currently don't exist.
17509. So there are some changes. When the CSD Report was released, we didn't envision changes to the *Fisheries Act* so these are new but, when that opportunity arose, I think those amendments will clarify the ministerial accountability and give the Department better tools for managing its responsibilities.
17510. So in sum, I would say the Department has done a lot of work in following up on the audit recommendations to strengthen not its ability to

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- implement but its ability to demonstrate that it's implementing and I think that was at the heart of the CSD comments was that the Department was not able to demonstrate.
17511. So its accountability in planning that are the main things, I think, that the Department has undertaken.
17512. **MR. McCORMICK:** Thank you, Dr. Caza.
17513. Madame Clerk, could we please go to page 37 of the same document?
17514. If we could please scroll down to -- I believe there should be some highlighted portion. Thank you. Oh, I'm sorry. I've -- page 38.
17515. If I could direct the attention of the witness panel to paragraph 1.133, "Establishing Expectations"?
17516. In noting that there were no formal arrangements by which Fisheries and Oceans Canada and Environment Canada established the expectations for administration of the pollution prevention provisions of the *Fisheries Act*, with respect to this Project specifically, have the DFO and Environment Canada coordinated their administration to ensure that all the potential concerns are being effectively addressed?
- (A short pause/Courte pause)
17517. **DR. CAROLINE CAZA:** This -- the recommendation as made here I think you can appreciate is at a much broader level and was designed to talk about, essentially, really, the updating of a formal MOU between the departments that we are actually in the process of discussions with DFO over. So it was not meant to be specific to this particular Project.
17518. I guess I could answer your question by saying that, at the working level, the two departments collaborate as is appropriate and communicate as is appropriate to this stage in the assessment of this Project but, beyond that, I don't think that we envision, at this point, a formal arrangement being required, at this stage and not in the future, in terms of administering our responsibilities with respect to this Project.
17519. From Environment Canada's perspective, those responsibilities would

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- be the enforcement of Section 36 of the *Fisheries Act* and I'm not sure that there would be a need for a formal arrangement independent of the Department's ongoing work with Fisheries and Oceans.
17520. Fisheries may have more to add to that.
17521. **MS. BONNIE ANTCLIFFE:** It's Bonnie Antcliffe here with Fisheries.
17522. I don't have a whole lot more to add to that other than just to note and confirm, at the working level within Pacific Region, we do have working relationships with Environment Canada. Certainly, we're located in the same building in terms of the two groups' Environmental Assessment Unit and we coordinate and collaborate as required on Section 36, or other matters of relevance, to ensure a more coordinated approach to environmental assessment between the two departments.
17523. **MR. McCORMICK:** Thank you.
17524. If we could please go to page 40, Madame Clerk?
17525. I'll direct the attention of the witness panel to paragraph 1.138, "Pollution Prevention Provisions". The second sentence in the paragraph indicating that:
- "Environment Canada does not use a risk-based approach to the Fisheries Act to identify, assess and address risks associated with non-compliance with the Act that could lead to significant harm to fish habitat."*
17526. Has Environment Canada developed a risk-based approach to identify, assess and address significant risks associated with non-compliance with the Act?
17527. **DR. CAROLINE CAZA:** Environment Canada has done some work on this. I would maybe talk about three things.
17528. One, as I mentioned, in order to do additional work on a risk-based approach, the Department first wanted to address what is actually identified in the sentence above it, the establishing results, expectations and appropriate accountability arrangements. And I think I just described those to you. So the

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Department has put in place a results management framework that it felt was necessary to establish the Department's expected outcomes for its work in the *Fisheries Act*.

17529. And that's a precursor for then going and saying, "Okay, we've established what outcomes we're looking for. What is an appropriate risk-based approach to implementing those or achieving those?"
17530. The risk-based approach has several elements to it. I mentioned one. Environment doesn't have -- hasn't historically had many tools to administer the *Fisheries Act*. It's a general prohibition and that comes with a number of challenges.
17531. So one of the risk-based approaches that the Department is taking is the amendment to the Fisheries -- the proposed amendment to the *Fisheries Act* that I believe was described as part of the -- Bill C-38 where the Department will develop a regulatory approach. Once the Minister has the clear legislative authority for implementing part of the section 36(3), the Department will have also the authority to be able to establish regulations that will enable the management -- the deposit of deleterious substances that are already well controlled. That is one risk management tool that the Department is looking at to assist.
17532. The other thing the Department is doing is it has undertaken a number of risk-based pilots where it is trying to look at different risk-based approaches to determining where it should focus its compliance and enforcement efforts, and this is ongoing work. It has not been -- the focus of the Department's work in the past year or so has been on the Bill C-38 amendments, so this work is still under development.
17533. But there will be more of a risk-based management approach that the Department will use but it's under development at this point.
17534. **MS. LAURA MACLEAN:** And if I may, just building on Dr. Caza's explanation, none of the description of the actions taken by Environment Canada to respond to the CESD report in front of you take away from the obligation that proponents have to comply with this legislation, 36(3), and to prevent pollution.
17535. So while the Department may be investing in additional compliance promotion-related activities that would include things like education, outreach,

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- inspections, in the context of the pipeline, for example, associated with this project, some of those compliance promotion type activities would properly fall to the National Energy Board as the lead for conducting inspections, for example.
17536. So I just wanted to add that for context.
17537. **MR. McCORMICK:** Thank you.
17538. Is there a further comment?
17539. **DR. CAROLINE CAZA:** I did just want to clarify, in case I had left any misunderstanding, that there are no changes being proposed to Section 36 to the general prohibition. So I hope I didn't give any -- I didn't want to give any misinformation in that regard.
17540. So, yes, Ms. Maclean is right that the Proponent is still required to comply with the general prohibition.
17541. **MR. McCORMICK:** Thank you.
17542. And I believe it was yourself, Dr. Caza, that mentioned a few risk-based pilots that are currently being undertaken by the Department.
17543. Are any of those risk-based pilots directed at spills of hydrocarbons into the marine environment?
17544. **DR. CAROLINE CAZA:** I'm sorry, you've gone beyond the knowledge that I brought with me today. So I don't have the details on that work at this point.
17545. **MR. McCORMICK:** Would it be possible for the Department to provide that information by way of undertaking?
17546. **MS. ANDERSON:** Madam Chair, I'm just -- we seem to be straying quite far from the evidence filed by the -- by Environment Canada and more into the operations of the Department and their response to this particular report.
17547. I don't know that it's relevant or helpful to the Panel anymore with respect to the issues before you but, if it is, we could consider making that undertaking or at least take it under advisement.

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--- (A short pause/Courte pause)

17548. **THE CHAIRPERSON:** Mr. McCormick, the Panel does not require that information in the considerations that it needs to make in this proceeding.

17549. **MR. McCORMICK:** Thank you, Madame Chair.

17550. **THE CHAIRPERSON:** Mr. McCormick, I would also just again remind you that we are here for you to ask questions on the evidence that has been filed, and we'd ask you to respect that request.

17551. **MR. McCORMICK:** Certainly, Madame Chair.

17552. The direction of the questioning goes to Environment Canada has a very serious responsibility in relation to the deleterious substances that may enter into the marine environment as a result of this Project, a risk that has been acknowledged and examined as part of the Application.

17553. The capacity of the Department to satisfy that obligation and ensure proper enforcement is where we were seeking to -- what we were seeking to test in relation to that, but we'll be happy to move along.

17554. **THE CHAIRPERSON:** Thank you, Mr. McCormick.

17555. I would ask you to restrict your questions to the evidence that has been filed by the federal government.

--- (A short pause/Courte pause)

17556. **MR. McCORMICK:** Madame Clerk, could we please see displayed on the screen -- just bear with me one moment.

--- (A short pause/Courte pause)

17557. **MR. McCORMICK:** Exhibit E9-21-08, page 52.

17558. I'll direct the attention of the witness panel to the answer to 5.1d).

17559. Just for your information, on an earlier page, the question as stated

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was:

“Please justify why Environment Canada did not recommend the Proponent conduct toxicity testing on Rainbow Trout, Daphnia or Luminescent Bacteria even though it is stated in Paragraph 74 that Environment Canada normally would not recommend the use of dispersants without such testing being previously conducted.”

17560. And I'll note -- or I'll direct the attention of the witness panel specifically to the sentence beginning with “Test data”.

17561. What conclusions regarding the potential effects can be drawn from the acute toxicity test data that exists for Corexit 9500A?

--- (A short pause/Courte pause)

17562. **DR. CAROLINE CAZA:** Thank you. I believe we will direct that question to Dr. Carl Brown who is on the line.

17563. **DR. CARL BROWN:** It's Carl Brown here.

17564. Certainly, I'm not a toxicologist. So I'm not certain that I'm qualified to answer that question.

17565. **DR. CAROLINE CAZA:** Sorry, my apologies, a moment.

17566. **DR. BRUCE HOLLEBONE:** I'm not a toxicologist either. So I'm not going to talk about the use of the data. But as part of our routine study we have an ongoing program to measure the effectiveness and provide baseline data on the oils that are within the national interest to examine in terms of their potential for effects in the environment. And part of this routine program is to measure the parameters, the acute toxicities mentioned here, with the view to providing baseline data to toxicologists to make those assessments.

17567. So that's the context in which this was requested. This is something that's been historically done for quite a number of years now and is maintained by our group as sort of reference data for providing to the spill response organizations during the event of a spill.

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17568. **MR. McCORMICK:** Thank you, Dr. Hollebhone.
17569. Has Environment Canada conducted an assessment of the toxicity of Corexit 9500A?
17570. **DR. BRUCE HOLLEBONE:** We have done a 96-hour LC50 against rainbow trouts, Daphnia Magna and the photo phosphorescent bacteria.
17571. **MR. McCORMICK:** And would Environment Canada agree that Corexit 9500A may be more toxic in some instances than the hydrocarbons that it is used to disperse?
17572. **DR. BRUCE HOLLEBONE:** You're getting beyond my realm of expertise and I'd have to leave this for somebody else on the panel. If there is somebody here who can do that.
17573. **DR. CAROLINE CAZA:** Yeah, I'm afraid -- certainly from the Environment Canada witnesses, I don't think we have anyone who could provide an answer to your question.
17574. **MR. McCORMICK:** Thank you, Dr. Caza.
17575. Just returning to what we see on the screen, the sentence immediately following "Test data", indicates that:
- "...Environment Canada is actively participating in research on more detailed toxicity testing at sub-lethal levels for this product."*
17576. Is that research occurring in-house or is that something that's taking place outside of Environment Canada?
17577. **DR. BRUCE HOLLEBONE:** That's referring to work that we were doing in conjunction with Queen's University at Dr. Hudson's lab -- Peter Hudson. That work is just now starting to be published in the scientific literature and it refers to that project.
17578. **MR. McCORMICK:** And we have a great deal of confidence in Dr. Hudson's work.

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17579. Will the results of that research be made available to inform the Joint Review Panel in relation to this project?
17580. **DR. BRUCE HOLLEBONE:** As I stated, the work is just now being -- the students are just now completing the work on that three-year project and the publications are, as we speak, in preparation. So they will be coming out in the scientific literature in peer reviewed journals within, I would guess, the next 6 to 12 months.
17581. **MR. McCORMICK:** Thank you, Dr. Hollebhone.
17582. Madame Clerk, could we please see Haisla Nation aid to cross-examination number 2?
17583. So this is an environmental toxicology paper entitled "Comparative Toxicity for Chemically Dispersed and Undispersed Crude Oils to Rainbow Trout Embryos". Has the witness panel had the opportunity to review the highlighted portions of this document?
- (No response/Aucune réponse)
17584. **MR. McCORMICK:** I believe I saw some heads nodding.
17585. **DR. BRUCE HOLLEBONE:** I think it's safe to say that both myself and Tom King are familiar with this document.
17586. **MR. McCORMICK:** Certainly. Thank you. I note the author lines.
17587. Does Environment Canada agree that dispersant use will increase the amount of oil in the water?
17588. **DR. BRUCE HOLLEBONE:** Disperse -- as shown in this study, the dispersant -- the application of dispersant can increase the amount of oil available in the water column.
17589. **MR. McCORMICK:** And does Environment Canada agree that dispersant use may increase the surface to volume ratio of the oil droplets?
17590. **DR. BRUCE HOLLEBONE:** I believe that was one of the outcomes of this study, yes.

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17591. I would -- I want to back up just a little bit here though. Certainly my role in this and maybe Tom can speak for his level of participation as well, my role here was as a provider of some of the baseline data; in particular, Table 2, and I believe Figure 1 of this is my work.

17592. The work that you're questioning me about actually, should more properly be directed towards Dr. Hudson or his students as they were the ones who actually conducted those experiments. My role on this paper was as an advisor on the chemistry and the behaviour of the oil in the water -- well, the -- based on the measurements that we've done of this oil and the preparation we did of these products for him.

17593. **MR. McCORMICK:** Thank you, Dr. Hollebhone.

17594. Do you agree with the conclusions of the paper?

17595. **DR. BRUCE HOLLEBONE:** To the limits of my knowledge and expertise, I do so, yes. But I will again hesitate to add that I was not -- I am not competent and not an expert on the toxicology that Dr. Hudson provided to this paper.

17596. **MR. McCORMICK:** And am I correct in my understanding, Dr. Hollebhone, that there is no one on the current witness panel that would be able to speak to those elements of the paper relating to toxicity of oil to fish?

17597. **MR. THOMAS KING:** Neither Bruce and I are toxicologists, we're both chemists and we both provided data in this studies. In our case we provided a lot of GCMS data which is isolating those components of interest that contribute to the toxicology.

17598. I may add to this though, that a lot of these tests are in sort of closed systems so you don't get the effect of continuous dilution so this is direct exposure at high concentrations. So this would be more like the initial exposure levels where the concentrations in the water column during the spill and initial application of dispersant are quite high. And then as you look at the effects of wave action and current -- its spatial dilution, these levels will fall off over time. And that's sort of a study I think that really needs to be done on the toxicology side.

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17599. **DR. BRUCE HOLLEBONE:** I will add that that idea of whether you look at a static test or a static renewal test which is to say you change the water and allow it to dilute over time is a fairly large difference between these sorts of studies.

17600. And I know Peter has looked at some work where he's looking at the more diluting type work later on in some of the studies I've alluded to. This was a very early study that came out of the program that we've previously talked about.

17601. **MR. McCORMICK:** Okay. Well, I'll try one more question. Please let me know if it falls outside the expertise of the witness panel.

17602. Does Environment Canada agree that dispersants may deliver the toxic components of oil to fish more quickly and efficiently than would occur in the absence of dispersants due to increased bioavailability?

17603. **DR. BRUCE HOLLEBONE:** We've already established that dispersants can increase the amount of oil in the water column. And I think the question of rate and how quickly that happens is something that we may need to leave for further research. But the amount is certainly true.

17604. Tom?

17605. **MR. THOMAS KING:** Yeah, I would agree with Bruce. I mean what happens with dispersants is that they allow you to break the oil up into smaller droplets which push them deep into the water column and they do make the components in the oil more bioavailable to species of fish.

17606. **MR. McCORMICK:** Thank you, gentlemen.

17607. Madame Clerk, if we could please see displayed on the screen Exhibit E9-21-14, page 6 at the bottom and we'll be crossing over onto page 7.

17608. So this is the Federal Government's response to Northern Gateway IR No. 1, and if we could please take a look at the last sentence in the first paragraph in Response paragraph A, immediately below "Preamble" -- or sorry, immediately below "Response", a little further down. Thank you.

17609. It indicates here that:

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"Dispersant effectiveness has not been tested by Environment Canada nor has data been provided for oilsands and related products in [representative] conditions ..."

17610. Noting that Environment Canada has not tested dispersants or received any data for "oilsands and related products", would you agree with me that the stability of dispersion for Corexit 9500A for use on products to be shipped by Northern Gateway is currently unknown?
17611. **DR. BRUCE HOLLEBONE:** This refers specifically and only to the testing of Corexit 9580 or any other dispersant with the products under consideration for shipping in the Northern Gateway Pipeline.
17612. We have a fairly large body of testing with regards to other oils but not specifically with regard to the products under consideration for shipping.
17613. I will also note though, however, that this is just one piece of information we use during a spill and the consideration for use of dispersant in Canada is a very -- if it would happen at all, would be a very involved process of which this is only a very small part.
17614. We use the concept called "Net Environmental Benefit" to determine the use of these products during an actual event and, to date, I don't believe it has ever been contemplated on a real scale simply because other factors -- whether that be within too near a shoreline or in too shallow a depth of water or other complicating factors -- have sort of precluded the use or not allowed the use.
17615. What I don't want to leave the impression here is that we do a bunch of tests on efficacy and toxicology and that's it, that's the usage. That's only one part and probably actually a minor part of whether we would use these products or not in the environment.
17616. So it's a complicated conversation when you come to the -- just -- the reason this was asked for from the Proponent was this is just the beginning baseline information we would need to have to even start that discussion.
17617. So we're not trying to approve or recommend use here, we're just trying to say: This is the very baseline information we would need to even have that discussion in the first place.

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17618. So that's the context here for why we're asking for it.
17619. **THE CHAIRPERSON:** Mr. McCormick, are you going to note the time first or am I?
17620. **MR. McCORMICK:** I was going to note it but I was also going to -- I've got just two or three more questions along this line and we would be finished with this particular ---
17621. **THE CHAIRPERSON:** I believe it's been a long day. I think we should stop.
17622. **MR. McCORMICK:** I'm happy to ---
17623. **THE CHAIRPERSON:** We're going to start again at 8: 00 o'clock tomorrow morning.
17624. **MR. McCORMICK:** Thank you, Madame Chair.
17625. **THE CHAIRPERSON:** So let's finish off for the day and then we'll begin again with the follow-up questions, Mr. McCormick, that you have on this discussion tomorrow morning.
17626. Ms. Niro, could we get an AQ, please, for the Haisla Nation for this Panel?
17627. **THE REGULATORY OFFICER:** That will be AQ88.

**--- AID TO CROSS-EXAMINATION NO./AIDE AU CONTRE-
INTERROGATOIRE No. AQ88:**

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17628. **THE CHAIRPERSON:** With that, I'll thank everybody for a productive day and we'll sit again tomorrow morning at 8: 00 o'clock. Thank you. Good evening.

--- Upon adjourning at 4:02 p.m./L'audience est ajournée à 16h02