

Commission of Inquiry into the Decline of
Sockeye Salmon in the Fraser River



Commission d'enquête sur le déclin des
populations de saumon rouge du fleuve Fraser

Public Hearings

Audience publique

Commissioner

L'Honorable juge /
The Honourable Justice
Bruce Cohen

Commissaire

Held at:

Room 801
Federal Courthouse
701 West Georgia Street
Vancouver, B.C.

Wednesday, August 17, 2011

Tenue à :

Salle 801
Cour fédérale
701, rue West Georgia
Vancouver (C.-B.)

le mercredi 17 août 2011

APPEARANCES / COMPARUTIONS

Wendy Baker, Q.C. Maia Tsurumi	Associate Commission Counsel Junior Commission Counsel
Tim Timberg Geneva Grande-McNeill	Government of Canada ("CAN")
Heidi Hughes	Province of British Columbia ("BCPROV")
No appearance	Pacific Salmon Commission ("PSC")
No appearance	B.C. Public Service Alliance of Canada Union of Environment Workers B.C. ("BCPSAC")
No appearance	Rio Tinto Alcan Inc. ("RTAI")
Alan Blair Shane Hopkins-Utter	B.C. Salmon Farmers Association ("BCSFA")
No appearance	Seafood Producers Association of B.C. ("SPABC")
No appearance	Aquaculture Coalition: Alexandra Morton; Raincoast Research Society; Pacific Coast Wild Salmon Society ("AQUA")
Tim Leadem, Q.C.	Conservation Coalition: Coastal Alliance for Aquaculture Reform Fraser Riverkeeper Society; Georgia Strait Alliance; Raincoast Conservation Foundation; Watershed Watch Salmon Society; Mr. Otto Langer; David Suzuki Foundation ("CONSERV")
Don Rosenbloom	Area D Salmon Gillnet Association; Area B Harvest Committee (Seine) ("GILLFSC")

APPEARANCES / COMPARUTIONS, cont'd.

No appearance	Southern Area E Gillnetters Assn. B.C. Fisheries Survival Coalition ("SGAHC")
No appearance	West Coast Trollers Area G Association; United Fishermen and Allied Workers' Union ("TWCTUFA")
No appearance	B.C. Wildlife Federation; B.C. Federation of Drift Fishers ("WFFDF")
No appearance	Maa-nulth Treaty Society; Tsawwassen First Nation; Musqueam First Nation ("MTM")
No appearance	Western Central Coast Salish First Nations: Cowichan Tribes and Chemainus First Nation Hwlitsum First Nation and Penelakut Tribe Te'mexw Treaty Association ("WCCSFN")
Brenda Gaertner Crystal Reeves	First Nations Coalition: First Nations Fisheries Council; Aboriginal Caucus of the Fraser River; Aboriginal Fisheries Secretariat; Fraser Valley Aboriginal Fisheries Society; Northern Shuswap Tribal Council; Chehalis Indian Band; Secwepemc Fisheries Commission of the Shuswap Nation Tribal Council; Upper Fraser Fisheries Conservation Alliance; Other Douglas Treaty First Nations who applied together (the Snuneymuxw, Tsartlip and Tsawout); Adams Lake Indian Band; Carrier Sekani Tribal Council; Council of Haida Nation ("FNC")
No appearance	Métis Nation British Columbia ("MNBC")

APPEARANCES / COMPARUTIONS, cont'd.

No appearance	Sto:lo Tribal Council Cheam Indian Band ("STCCIB")
No appearance	Laich-kwil-tach Treaty Society Chief Harold Sewid, Aboriginal Aquaculture Association ("LJHAH")
No appearance	Musgamagw Tsawataineuk Tribal Council ("MTTC")
No appearance	Heiltsuk Tribal Council ("HTC")

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1 Vancouver, B.C. /Vancouver
2 (C.-B.)
3 August 17, 2011/le 17 août
4 2011
5

6 THE REGISTRAR: The hearing is now resumed.

7 MS. BAKER: Thank you, Mr. Commissioner, welcome back
8 from the break. And I have a few housekeeping
9 matters to take care of left over from the
10 previous hearing dates, before we started today
11 with Jack Rensel, who is here from the U.S. So if
12 I can just run through these fairly quickly.

13 We have a few matters that are outstanding,
14 so we added the follow-up from our days with Greg
15 Savard and Carol Cross, some outstanding follow-up
16 that was asked, that you asked the witnesses to
17 do. That came by letter from Canada on August 2,
18 2011, and attached to that letter was a document,
19 Service Schedule. So I'd like to have those
20 marked as an exhibit, the letter as the numbered
21 exhibit, and then the schedule attached as that
22 number A.

23 THE REGISTRAR: That will be marked as Exhibit number
24 1361, and 1361A.
25

26 EXHIBIT 1361: Letter to Commission from DFO
27 re Request for Information on Habitat
28 Enhancement and Restoration, August 2, 2011
29

30 EXHIBIT 1361A: Attachment to Exhibit 1361,
31 DFO Financial Information re Habitat
32 Enhancement and Restoration, July 26, 2011
33

34 MS. BAKER: Thank you. We also had, of course, Skip
35 McKinnell was here as a witness in July and his
36 c.v. was marked, but his c.v. was not redacted and
37 his personal information was still on that
38 document. So we'd like to replace the c.v. that
39 was marked as Exhibit 1284 with a redacted version
40 of that c.v. So it would just be a replacement of
41 the one that was previously marked.

42 THE REGISTRAR: So marked.
43

44 EXHIBIT 1284: Replacement c.v. of Stewart
45 McKinnell with personal information redacted
46

47 MS. BAKER: And then the last outstanding matter is on

1 the day that we had pulp and mining witnesses,
2 there were some questions that were left for those
3 witnesses to complete in writing, and those four
4 responses have now been received, and I would like
5 them to be marked in sequence as one exhibit, so
6 the exhibit and then A, B, C, D, and I'll just go
7 through them. So the response from Robert Grace
8 would be the first of that exhibit.

9 THE REGISTRAR: That will be marked 1362.

10
11 EXHIBIT 1362: Responses to Exhibit 826
12 (Technical Report 2) - Robert Grace, July 9,
13 2011
14

15 MS. BAKER: The next would be the response of Mr.
16 Hagen.

17 THE REGISTRAR: That will be marked as 1362A.

18
19 EXHIBIT 1362A: Responses to Exhibit 826
20 (Technical Report 2) - Michael Hagen, July 8,
21 2011
22

23 MS. BAKER: Next would be the response of Douglas Hill.

24 THE REGISTRAR: That will be 1362B.

25
26 EXHIBIT 1362B: Responses to Exhibit 826
27 (Technical Report 2) - Douglas Hill, July 8,
28 2011
29

30 MS. BAKER: And the last one would be the responses of
31 Janice Boyd.

32 THE REGISTRAR: That will be 1362C.

33
34 EXHIBIT 1362C: Responses to Exhibit 826
35 (Technical Report 2) - Janice Boyd, July 8,
36 2011
37

38 MS. BAKER: Thank you. That takes care of my
39 housekeeping matters, and I'd like to identify
40 that we're starting today with further
41 continuation of the marine hearings. Our witness
42 today is Dr. Jack Rensel. To begin the day, I'd
43 like to -- we also prepared a Policy and Practice
44 Report, which was distributed on July 21, 2011.
45 It's titled "Overview of Marine Environment Issues
46 Potentially Relevant to Fraser Sockeye Salmon".
47 I'd like that marked as the next PPR.

3
Jack Rensel
In chief on qualifications by Ms. Baker

1 THE REGISTRAR: That will be marked as PPR number 19.

2
3 PPR19: Policy and Practice Report titled
4 "Overview of Marine Environment Issues
5 Potentially Relevant to Fraser Sockeye
6 Salmon" distributed July 21, 2011
7

8 MS. BAKER: And then with Dr. Rensel, now we finally
9 begin with him. So if he could be sworn in,
10 please.
11

12 JACK RENSEL, affirmed.
13

14 THE REGISTRAR: Would you state your name, please.

15 A Jack Rensel.

16 THE REGISTRAR: Thank you. Counsel.

17 MS. BAKER: Thank you. Mr. Commissioner, because we
18 have limited time for these two days of marine
19 hearings, I prepared, or had an affidavit prepared
20 for Dr. Rensel, which has been circulated to all
21 the participants., and I'd like to have that
22 marked. That contains the bulk of the direct
23 evidence that I would be calling from Dr. Rensel.
24 I also circulated a notice to my friends that I
25 would be having him qualified as an expert as on
26 the areas of expertise set out in paragraph 3 to
27 that affidavit and asked if they would let me know
28 ahead of time if they had any challenges on
29 qualifications so that we could move through that
30 part fairly quickly without having to go through
31 orally the qualifications. And I have received
32 nothing from my friends, so I'd like to deal with
33 the affidavit fairly quickly.
34

35 EXAMINATION IN CHIEF ON QUALIFICATIONS BY MS. BAKER:
36

37 Q The affidavit was sworn this morning, although
38 circulated in unsworn version to the participants
39 last week. So I will just ask, Dr. Rensel, if you
40 could identify this is your affidavit on the
41 screen?

42 A Yes.

43 MS. BAKER: Okay. We'll get that marked please.

44 THE REGISTRAR: That will be marked Exhibit 1363.
45

46 EXHIBIT 1363: Affidavit #1 of Jack Rensel
47 sworn August 17, 2011

August 17, 2011

4

Jack Rensel

In chief on qualifications by Ms. Baker

In chief by Ms. Baker

1 MS. BAKER:

2 Q And, Dr. Rensel, your c.v. is attached. I'll just
3 go through the exhibit. There's the main part of
4 the exhibit which simply really identifies the
5 exhibits that are attached. Exhibit A is your
6 c.v., correct?

7 A Yes.

8 Q Exhibit B is an updated figure which we'll get to,
9 which is contained in a report that you have
10 prepared.

11 A That's correct.

12 Q And there we are, there's Exhibit B. And then
13 Exhibit C is a series of questions that I posed to
14 you with numbers, and then your answers
15 underneath, and that carries on for the remainder
16 of your affidavit.

17 A Yes.

18 MS. BAKER: Okay. Mr. Commissioner, question 1 of
19 Exhibit C I have asked Dr. Rensel to describe in
20 summary form the work that he has done and the
21 expertise he developed relevant to the impact or
22 potential impact of harmful algal blooms on Fraser
23 River sockeye. That, coupled with his c.v., which
24 is Exhibit A, I would submit that his expertise in
25 the areas that I have identified at paragraph 3 of
26 his affidavit, we ask that he be qualified as an
27 expert in the areas of algal zooplankton in marine
28 and freshwater habitat. This is on paragraph 3 of
29 the affidavit.

30 I guess you need to see it, don't you.

31 THE COMMISSIONER: Yes, thank you very much.

32 MS. BAKER: Yes, thank you. There should be a spare
33 copy available. I'll just pass up the original.
34 So paragraph 3 of that affidavit identifies his
35 expertise in the areas of algal zooplankton and
36 marine and freshwater habitats, harmful algal
37 bloom dynamics, monitoring and mitigation studies,
38 and fish physiology studies, bioassays and fish
39 kill assessments, and I ask that he be qualified
40 in those areas.

41 THE COMMISSIONER: Yes, very well. Thank you.

42 MS. BAKER: Thank you.

43

44 EXAMINATION IN CHIEF BY MS. BAKER:

45

46 Q An article of yours, which we will be referencing
47 in these hearings, has already been marked as an

5
Jack Rensel
In chief by Ms. Baker

1 exhibit in this Commission of Inquiry, that's
2 Exhibit 1359. If that could be brought up.
3 That's a paper you prepared?
4 A Yes, it is.
5 Q And when in your affidavit you make reference to
6 the paper, or this is detailed in the paper, is
7 this the paper you're referring to?
8 A Yes.
9 Q Thank you. And was this paper prepared as a
10 result of some work you were doing for an agency,
11 or another party of any kind?
12 A No, it was my personal effort, along with my
13 colleagues.
14 Q Thank you. Now, if we could turn to the final
15 page of this exhibit, or -- I'm sorry, final page
16 of content, which is actually numbered page 112 on
17 the journal pages. Thank you. So this sets out
18 at the bottom of the first column just some
19 general conclusions, and I just wanted to just
20 point to that paragraph, but really ask you if you
21 could explain the correlations that you found in
22 your work between *Heterosigma* and Chilko, and also
23 between Chilko and juvenile herring.
24 A We examined Chilko because, of course, there are -
25 - it's the only stock that has marine survival
26 data. We determined that over a 20-year period
27 when there was available data, both from survival
28 of the fish and algal blooms, that in those cases
29 when there was a *Heterosigma akashiwo*, that's the
30 harmful algae bloom we're talking about in the
31 paper. When that occurred in the south Strait of
32 Georgia, in the year when the smolts were out-
33 migrating, inevitably there would be a correlation
34 with a poor return two years later.
35 Q And then with the juvenile herring, how did that
36 factor in?
37 A Then the juvenile herring correlation was, which
38 is Figure 5 in the publication, and updated with
39 the most recent year, where the correlation was
40 upheld, that demonstrates or at least strongly
41 suggests that a major source of mortality to the
42 fish in the marine waters is occurring in the
43 Strait of Georgia, and not somewhere else.
44 Because the juvenile herring and the -- because it
45 shows the juvenile herring survival for the first
46 summer at sea as in the Strait of Georgia, and it
47 matches so strongly with the full two-year

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6
Jack Rensel
In chief by Ms. Baker

1 survival of the Chilko stock of sockeye salmon.
2 Q Right. The figure that you're referring to is on
3 page 107 of the publication, Figure 5?
4 A That's right.
5 Q And then that has been updated by you as Exhibit B
6 to your affidavit; is that right?
7 A That's right. And it actually --
8 Q Maybe we can just wait for him to pull that up on
9 the screen, and then we can see those. It's after
10 the c.v. There.
11 MR. LUNN: Do you want to compare the two?
12 MS. BAKER:
13 Q Yes, but the imaging isn't very good unfortunately
14 on the screen, but...
15 A But the only point, if I may, the only point on
16 the one with the poor image is that there's a
17 general correspondence in the 2008 seawater entry,
18 2010 return here also for the Chilko stock,
19 compared to the survival of the herring. And in
20 the paper we talk about how these factors affect
21 other fish as well as the salmon, and then this is
22 evidence of that.
23 Q Were you able to draw any conclusions about
24 whether the *Heterosigma* algae is causing any
25 mortality in juvenile salmon?
26 A We don't know exactly whether it is direct
27 mortality, acute mortality, chronic mortality, or
28 if there's a food web effect, or all of the above.
29 And likely, given the reputation of the species,
30 it could be some combination. The fact that in
31 north Puget Sound when these events were
32 occurring, we also saw fish dying, wild fish dying
33 to some extent, and the fish farms were acting as
34 -- in north Puget Sound were acting as bioassay
35 indicators to show that this bloom is really
36 toxic.
37 And a key component to understand is that the
38 blooms are unialgal, so when you go out and sample
39 plankton, when you have a major bloom going on,
40 you find nothing but *Heterosigma*, a few other
41 organisms but very, very few. So what's happened
42 there it's -- it has extirpated those other
43 organisms through its chemical properties and
44 taken over the upper water column.
45 Q Can you just explain how the *Heterosigma* bloom
46 actually happens, like what is the mechanism where
47 it goes from cyst to bloom?

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7
Jack Rensel
In chief by Ms. Baker

- 1 A There's no single factor that causes harmful algal
2 blooms usually, and that's the case with
3 *Heterosigma*. They generally, in our region and
4 the Salish Sea, they originate from relatively
5 shallow sediments, fine sediments in back bays
6 like English Bay, that's been every year sampled
7 since 1967. There's been the vegetative form, the
8 swimming form of the algae that comes out of the
9 cyst form that's in the sediments has been found.
10 And then it has to be a combination of weather and
11 nutrients and freshwater flow, in this case from
12 the Fraser, sets up a stability in the system that
13 *Heterosigma* likes. So when all the factors come
14 together, then you have a large bloom, and then of
15 course it can be transported or advected to other
16 areas by winds and tides. And that's what we see
17 in north Puget Sound is the estuarine flow where
18 the water is generally moving south to the ocean
19 along with the Fraser River flow. You see the
20 export of the blooms killing fish at the fish
21 farms and the wild fish that we've seen.
- 22 Q And the blooms that you're seeing in Puget Sound,
23 are those related in any way to what's happening
24 in Canada in the Strait of Georgia in our waters
25 here?
- 26 A Oh, yes, of course, and it's a political boundary,
27 and it's one system, and, you know, we provide a
28 data point in north Puget Sound and in the paper
29 we talk about our sources of data. We don't have
30 continuous data in terms of we missed a few,
31 there's a few years missing. Because we didn't
32 know at the time, my colleagues that collected the
33 data, or analyzed the data, Ms. Haigh, from
34 Nanaimo, didn't know that of course there would be
35 this connection. So she was collecting data on a
36 volunteer basis for the south Strait of Georgia,
37 but the other areas are well sampled, too.
- 38 Q In our work both locally in the Salish Sea area
39 and elsewhere in the world, have you seen trends,
40 either on the frequency or the intensity of
41 harmful algal blooms?
- 42 A There's a general agreement in the field of marine
43 ecology and also algal bloom science that there is
44 a major increase worldwide going on. I've just
45 returned from the Arabian Sea and the Gulf of
46 Oman, where there's a novel species that killed
47 and wiped out large populations of wild and farmed

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1 fish through the United Arabian Emirate, Saudi
2 Arabia, and a number of other places. And that
3 same species now occurs in Puget Sound and the
4 Strait of Georgia. We haven't had major events
5 with that one, but it's expected that at some
6 point it will bloom. But worldwide, there seems
7 to be -- coastal oceans seem to be more affected,
8 both in intensity of the blooms and the extent of
9 the blooms.

10 Q And are salmon at risk of any types of harmful
11 algae, other than *Heterosigma*?

12 A In our areas they certainly are. There's harmful
13 diatoms that stick in the gills that cause
14 mortality that I've personally done a lot of
15 research on. There's a couple of species that are
16 from the Asian, the South China Sea and Korea,
17 that are in our areas. My colleague, Ms. Haigh,
18 who conducts the Harmful Algal Bloom Monitoring
19 Program, has data for the entire area around
20 Vancouver Island, both sides, and we just focused
21 on the *Heterosigma* data. We didn't have the
22 opportunity or time to look at all the species.

23 Q In Exhibit C, which are your answers to the
24 questions I posed to you, question number 3 you
25 refer to work that was formerly done by DFO. If
26 that could just be pulled up. Question 3 to
27 Exhibit C, which would be the second page of that.
28 There we go. In the answer to the question 3 you
29 say that:

30
31 Formerly DFO had a harmful algal bloom
32 research program and researchers at
33 University of B.C. and Simon Fraser
34 University were involved in basic research,
35 but DFO terminated the program about 6 years
36 ago and the academics either retired or moved
37 on.

38
39 Can you just give us a bit more detail about the
40 work that was done in B.C. previously, and let us
41 know whether you think any of that work should be
42 revisited, or would be usefully redone.

43 A I've worked with these people as colleagues, both
44 at UBC and in DFO, and at the time the focus was
45 on the effects on farm fish. And at the same time
46 there were observations being made of a broad
47 scale that when unusual events occurred were, for

1 example, in 1993 and 1997 there were blooms that
2 covered the entire Strait of Georgia, north to
3 south, and lasted for up to four months.

4 And so these people, they were focused on the
5 near field, sort of looked at the far field. And
6 one fellow in particular, Max Taylor, Professor
7 Max Taylor from University of British Columbia,
8 and his students did a number of studies both in
9 inlets and throughout the Strait, determining the
10 significance of the -- not the significance, but
11 the extent of these blooms, and some idea about
12 where they were originating and the causes.

13 Q All right. And is there any work that could be
14 done today with new techniques?

15 A So presently except for the harmful algal bloom
16 monitoring at fish farms, and of course most of
17 the fish farms are located further north, there
18 isn't much monitoring in the south Strait of
19 Georgia. And, yes, this alga *Heterosigma* is
20 actually very easy to identify and count when it's
21 live, very inexpensive to do so, and there's a
22 number of molecular techniques that weren't
23 available 20 years ago that are now, that can
24 embellish the analysis to understand what kind of
25 *Heterosigma* it is, because there are different
26 clones or different races of *Heterosigma*.

27 In British Columbia there's the thought that
28 sometimes the blooms aren't toxic. In Washington
29 State they're always toxic. We don't understand
30 that, except that we believe that this is a
31 difference in environment, and/or the different
32 types of clones that are -- or ecotypes that are
33 dominating.

34 Q In these hearings, we have already heard about
35 chlorophyll as a proxy to measure zooplankton for
36 fish. Is chlorophyll always a good measure of
37 secondary production of zooplankton?

38 A Chlorophyll is a good measure of primary
39 production often, but not always, and it's always
40 good to know, say if you're using a satellite
41 image with chlorophyll colour, it's good to know
42 that to validate that first it's correct, because
43 if you have interferences like the high amount of
44 silt that's in the Fraser River, it's difficult to
45 write algorithms to -- to correct that data so
46 that it's correct.

47 But also, chlorophyll is not a good measure

1 of the beneficial effect of phytoplankton in all
2 cases, because, of course, we have and see major
3 harmful algal blooms which can be killing off
4 higher organisms in the food web, and in fact do.
5 And if you were just to use chlorophyll as the
6 fodder for the food web at all times, you could be
7 easily misled.

8 Q Are you familiar with a workshop that was hosted
9 by the Pacific Salmon Commission in June of 2010.

10 A Yes. Yes, I attended that workshop. I was
11 invited by the U.S. component of the Commission.

12 Q And the proceedings from that workshop have been
13 marked as Exhibit 73 in this inquiry. And harmful
14 algal blooms, and in fact your commentary is
15 summarized in this document, and I just wanted to
16 take you to two places in this document. At page
17 9 there's a summary table, which I just wanted to
18 flag, and you'll see harmful algal bloom
19 hypotheses is number 4 in that table, and then I'd
20 also like to take you to page 74, where the
21 harmful algal bloom section is set out, part of
22 the section, and there's a conclusion there set
23 out at section 4.4.5. And have you reviewed these
24 documents?

25 A Yes, I have.

26 Q Okay. Do you agree with the rating that was given
27 for the harmful algal bloom hypotheses in the
28 table page 9, or the conclusions about the
29 likelihood of the hypothesis being correct, which
30 are set out on the screen before you at 4.4.5.

31 A Could we go back to that other screen, please.

32 Q Page 9. So you'd like to see the whole table, I
33 take it.

34 A No, this is fine. These are a list of different
35 hypotheses and different proofs that could be
36 causing mortality and poor survival of the Fraser
37 River sockeye. And the way the workshop was set
38 up, individuals were assigned a topic and they
39 were more or less arguing that single topic. And
40 what's missing here, of course, is that it's very
41 unlikely that a single cause was a sole cause of
42 the problem. And I can't agree with it entirely,
43 of course, because what happened during the
44 workshop is that small groups got together and
45 voted, and -- excuse me, there were small groups
46 got together and discussed their topic, and what
47 kind of rating it would be, and then the major

1 group reconvened and at that point most of the
2 U.S. contingent had left, including myself,
3 because of a travel problem with the ferries. And
4 so it really was sort of a popularity contest of
5 which, what your biases were when you came in on
6 the issue.

7 People generally were surprised about my
8 talk, which went on for an hour instead of the 20
9 minutes allotted initially. I was asked a lot of
10 questions, and I think that it was novel to them,
11 the idea that this could actually occur. So you
12 can see that "3b", ocean conditions -- sorry, "3a"
13 is ocean conditions inside the Strait of Georgia,
14 and that was generally represented by Dr. Dick
15 Beamish, and number "4" was the harmful algal
16 bloom hypothesis. And so people had different
17 opinions and they stuck with those opinions. And
18 I don't -- I was the only harmful algal bloom
19 scientist there, of course -- not of course, but
20 that was the fact, and so it was a voting and you
21 take it for what it's worth, I guess.

22 Q Was there causal evidence presented in relation to
23 any of these theories, or is it all about
24 correlations on the data?

25 A This whole meeting was really about correlation
26 and the data that I presented and subsequently
27 published in the paper showed very high
28 correlations, and if you were just to vote based
29 on correlations, the harmful algal bloom
30 hypothesis should have been the very likely one.
31 And I've discussed with Dr. Dick Beamish about
32 several times and corresponded with him since then
33 about how "3a", the ocean conditions inside the
34 Strait of Georgia are really no different than
35 number 4, the harmful algal bloom hypothesis;
36 they're really subsets of the same topic.

37 Q So the conditions in the Strait of Georgia that
38 gave rise to harmful algal blooms could also be
39 the same conditions that were contributing to the
40 causes that are hypothesized by Dick Beamish, is
41 that fair?

42 A That's right, and I think Dr. Beamish agrees to
43 that now.

44 Q In 2010 fish came back in great numbers, as you
45 know, and how do you reconcile the fact that they
46 -- those fish were in the Strait of Georgia as
47 juveniles in 2008 and there was a large harmful

- 1 algal bloom in the Strait in 2008.
2 A Different stocks. We know a little bit more about
3 the Chilko stock as far as the juveniles emerging
4 into the sea, coming out of the river. Apparently
5 the 2010 run was a different stock that was
6 dominant. And the timing of the bloom, the major
7 bloom that was a level 3 out of the 1 through 3
8 category, wasn't until the third week of June when
9 most of the Chilko fish would have been -- would
10 have already gone into the Strait, and most of
11 them actually moved out of the Strait. So that
12 this whole thing with harmful algal blooms is all
13 about timing. What was unique about 2007 was we'd
14 never seen a *Heterosigma* bloom in May, and it
15 coincided with the peak of the outmigration.
16 So others, Brian Riddell and others who were
17 involved in the workshop, were quite certain that
18 and voiced the opinion that it looked very likely
19 that this was a major cause in 2007. But again,
20 other people have said ocean conditions were bad
21 up north in Queen Charlotte Sound and further
22 north, and I don't disagree there was probably a
23 lack of food there. So it would a one-two punch,
24 maybe a one-two-three punch, if you consider the
25 Gulf of Alaska being in poor condition that year,
26 too.
27 Q While we have Exhibit 73 on the screen, if you
28 could turn to pages 74 to 75, it sets out some
29 proposed research to be done to better understand
30 harmful algal blooms in our waters. Have you
31 reviewed that proposed research, or those proposed
32 research ideas?
33 A Yes, I have. Let me see, though. This is the
34 summary from the 2010 workshop, right?
35 Q That's right.
36 A Right. I actually haven't reviewed it in the last
37 several days, so I'd have to look at it a little
38 bit here, but go ahead on it.
39 Q I was just going to ask if you had any -- if you
40 agreed with those recommendations or you felt that
41 they were reasonable recommendations.
42 A So it's calling for monitoring, looking at using
43 remote sensing, studying the causes of the
44 mortality to the fish that needs to be done and
45 we're actually doing in Washington State right now
46 with NOAA. So, yes, I would generally agree with
47 these.

- 1 Q Okay. And then Canada's list of documents,
2 document number 3, they have included a draft
3 summary report from a DFO synthesis workshop held
4 in April of this year, 2011, and it appears to be
5 revisiting the results from the PSC workshop that
6 we just looked at. If that document number 3 on
7 Canada's list could be pulled up. And I take it
8 you weren't invited to this.
- 9 A No, I was not.
- 10 Q If you turn to the page 4 of this document,
11 there's a reprint of the table that we've already
12 looked at, although they've put "Xs" on certain of
13 the theories -- oh, sorry, page 3, and it has a
14 note at the top that says "X" indicates the re-
15 evaluated ranking from the outcomes, and you'll
16 see that number 4 has changed slightly. Do you
17 have any comments on this, that they -- and I'm
18 really just asking if you can relate this to the
19 evidence you've already given on the PSC table.
20 Does anything change when we look at the revised
21 table here?
- 22 A I believe this was -- this workshop was just for
23 DFO employees; is that right?
- 24 Q That's my understanding, yes.
- 25 A Right. And so I don't take offence that I wasn't
26 invited. They've bumped up the hypothesis to
27 "possible", is all I can say.
- 28 Q All right. But your comments earlier about the
29 same conditions as represented in "3a" and in
30 number "4" would apply still?
- 31 A Right. And I think I saw, I asked for in some of
32 the correspondence that was email correspondence
33 among DFO employees, and I was pleased to see that
34 people were discussing the harmful algal bloom
35 hypothesis subsequent to my first contacting Dick
36 Beamish in 2009. And so I think people are
37 thinking more about it, a number of people.
- 38 Q All right. And then page 5 of this document
39 that's on the screen, at the bottom there you can
40 see Jim Irvine was the one who talked about
41 harmful algal blooms, and he sets out some
42 research requirements at the last bullet under
43 that heading, "Harmful Algal Blooms", and would
44 you -- do you have any comments on those research
45 requirements?
- 46 A Jim Irvine, I worked with him when I was -- when
47 my colleagues and I were preparing the paper. He

14
Jack Rensel
In chief by Ms. Baker
Cross-exam by Ms. Grande-McNeill (CAN)

1 was assigned by DFO to work with us to provide
2 information and to help us, and he did a good job,
3 and I agree with what he said here.

4 MS. BAKER: Could I have this document marked as the
5 next exhibit, please.

6 THE REGISTRAR: That will be Exhibit number 1364.

7
8 EXHIBIT 1364: Draft Summary Report, DFO
9 synthesis workshop on the decline of Fraser
10 River sockeye, April 14-15, 2011

11
12 MS. BAKER: Thank you.

13 Q And the last question I have for you, in the
14 Commission document number 19 there's a summary of
15 a harmful algal bloom monitoring program that was
16 prepared by, I understand, Nicky Haigh. Have you
17 had a look at this document before?

18 A Yes, I looked at it yesterday.

19 Q And do you have any comments on whether this is a
20 reasonable monitoring program for harmful algal
21 blooms?

22 A Well, it's really a proposal to have a monitoring
23 program that would be beyond what just the fish
24 farmers do, and she's an independent contractor,
25 but -- and very capable of doing what she does,
26 but there's quite a limitation in where she can
27 get samples from.

28 Q Right. Would you support this kind of monitoring
29 program?

30 A Yes, I would.

31 MS. BAKER: All right. I'll have that marked, please.

32 THE REGISTRAR: Exhibit 1365.

33
34 EXHIBIT 1365: Haigh, assessing the impact of
35 harmful algal blooms on wild salmon
36 populations in B.C.: planning for a HAB
37 monitoring program

38
39 MS. BAKER: Thank you. And those are the questions I
40 have for Dr. Rensel. Canada will follow me.

41 MS. GRANDE-McNEILL: Geneva Grande-McNeill for Canada
42 with Tim Timberg.

43
44 CROSS-EXAMINATION BY MS. GRANDE-McNEILL:
45

46 Q If we can have Exhibit 1359, Dr. Rensel's paper,
47 and if we could go to page 1 near the bottom of

1 the second column, Dr. Rensel, you write:
2

3 Previously, harmful algae have never been
4 directly linked with significant losses of
5 wild salmon in coastal oceans, although some
6 observations of dead wild salmonids in
7 shallow inlets or along beaches of deeper
8 areas have occurred with every major
9 *Heterosigma* bloom observed in North Puget
10 Sound in the past two decades and recurring
11 wild fish kills have occurred in other
12 regions, as described below.
13

14 So you write that there's never been a direct
15 link. Would you agree that there's still no known
16 or established causal link between harmful algae
17 and significant losses of wild salmon?

18 A I agree that we haven't seen the forensic evidence
19 of the -- of the carcasses, and if I may just
20 briefly explain. You will see pictures of fish
21 kills in the tropics and the semi-tropical areas,
22 most extensively in Hong Kong, where there were --
23 the government hired us to look at major problems
24 with algal blooms there, and you will see huge
25 rafts of dead fish, and both wild and farmed, and
26 there the water is quite warmer, the bacterial
27 action in the gut of the fish and inside the fish
28 causes gas production and they float up very
29 rapidly. And the paper goes into great extent
30 explaining how our fish in these waters mostly
31 sink, just as they do in fish farms. Over 99
32 percent of them, is my estimate, sink in the fish
33 farms, and then they sink out of the warmer
34 surface layer to the deeper layer that is cool.
35 And so the rate of refloating could be low, you
36 have predators in the deep water, as well as the
37 shallow water. So the paper goes on about that to
38 an extent.

39 Q Right. And so but in B.C. waters for wild
40 salmonids, do we know if there's an established
41 causal link to *Heterosigma*, and --

42 A No, we don't. No.

43 Q We don't. And you'd agree we don't know by what
44 mechanism, if any, *Heterosigma* may be causing
45 mortality?

46 A No, that's not true. In some cases we've seen,
47 and I personally have prime knowledge and

- 1 collected gill samples and seen massive changes to
2 the histology, the cell structure of the gills.
3 And the most common hypothesis is that a hydrogen
4 peroxide-like compound is released by the alga,
5 and causes this injury to the gills. But there's
6 also evidence, the Japanese have published papers
7 showing that toxins have been produced,
8 brevetoxins in particular have been produced. I
9 think the paper gets into that, too.
- 10 Q And so your paper does discuss some of the
11 hypotheses of the mechanism. But you write, and
12 if we go to page 3 --
- 13 A I'm sorry, I couldn't hear you.
- 14 Q Sorry. If we turn to page 3 of the paper and near
15 the bottom of the first column on the left, you
16 write:
- 17
18 Several possible causes of fish mortality
19 from exposure to *Heterosigma* have been
20 proposed but no single cause has been
21 indisputably identified.
22
- 23 And then you go on to discuss some of the theories
24 that you've just mentioned.
- 25 A Yes.
- 26 Q And so you'd agree we don't actually know what
27 mechanism may be at play.
- 28 A No. And I think it actually -- the paper goes on
29 to discuss how there's different clones or
30 different ecotypes of *Heterosigma* that exist, and
31 it's very likely that they have different
32 manifest, different mechanisms of mortality, just
33 as they have different growth rates, different
34 behaviours. So we're not -- we're dealing with
35 one genus species, but within that genus species
36 there's a large repertoire of behaviour.
- 37 Q And do we know, you mentioned earlier that
38 sometimes it is toxic and sometimes it's not. Do
39 we know what environmental or other trigger might
40 cause *Heterosigma* to become toxic?
- 41 A It's clear from the work that I've done in the
42 laboratory at the University of Washington with my
43 colleagues that a bacterial cofactor is important.
44 It's very difficult, actually it's impossible to
45 kill fish in the laboratory with an axenic or pure
46 culture *Heterosigma*, but in -- I'm sorry, the
47 focus of your question was...?

- 1 Q Do we know causes *Heterosigma* to become toxic, to
2 become (indiscernible - overlapping speakers).
3 A Oh, okay. Yeah, we don't know exactly, but it's
4 common with harmful algal blooms to have some
5 variability in toxicity depending on the growth
6 stage. In other words, are they growing
7 exponentially, are they becoming senescent, some
8 are toxic in one phase, some are toxic in another.
9 I could speculate more, but there's a need for
10 some more research on that.
- 11 Q Okay. And you've touched on this, but is it fair
12 to say that while you hypothesize that *Heterosigma*
13 may be a factor in Fraser sockeye mortality, there
14 may be also indirect sub-lethal or cumulative
15 effects involved?
- 16 A Yes.
- 17 Q At this point I guess we don't know enough to know
18 whether *Heterosigma* blooms are directly causing
19 mortality, or whether they're one of cumulative or
20 co-occurring stressors?
- 21 A We don't know that, that's correct, and we don't
22 know -- it's a little bit of the chicken and the
23 egg. You get these conditions and you have
24 *Heterosigma*, and the *Heterosigma* didn't cause the
25 physical conditions, but it takes advantage of it
26 and then the other species that are normally
27 present are at a disadvantage.
- 28 Q Right. Now, on those conditions, what are some of
29 the factors that are contributing to this
30 increased incidence and earlier timing shift of
31 *Heterosigma* blooms in the southern Strait of
32 Georgia?
- 33 A The 2007, and actually the paper shows that the
34 very profound importance of the early and large
35 discharge of the Fraser River in setting the
36 conditions. Again, another correlation, but one
37 that fits exactly with what the known *modus*
38 *operandi* of the alga, in other words its strategy.
39 It does very well in brackish water. And so the
40 south Strait of Georgia has always probably been a
41 great place for *Heterosigma*. And in 2007 again we
42 believe that it was the fact that this was a very
43 early high discharge that occurred and followed by
44 sunny weather that set up the condition.
- 45 Q Right. So earlier than normal and prolonged
46 peaking of Fraser River discharge, that was a
47 contributing factor?

- 1 A I didn't hear the last part, Fraser River...
- 2 Q Right. Earlier than normal and prolonged peaking
3 of Fraser River discharge, that's a factor?
- 4 A Well, yeah, but it's from the -- from the fish
5 point of view they're only going to spend maybe
6 five, six weeks in the Strait of Georgia, so it's
7 a timing issue. And if it goes on, like this
8 year, the levels have been way above the averages,
9 and the upper confidence levels, for 75 percent
10 levels of the whole summer, but it doesn't really
11 matter to the fish if they're out in the ocean.
- 12 Q All right. And would sea surface temperatures and
13 increased sea surface temperatures or increased
14 air temperatures, would that -- would those play a
15 role, as well?
- 16 A There's a direct relationship with faster growth
17 with increasing water temperature with algae, with
18 phytoplankton, and there's also the issue of 15-
19 degree water temperature for the sea beds where
20 these things are overwintered as cysts. And so
21 the evidence is that I reviewed in the paper that
22 there's a steady multi-decade, 50- to 70-year
23 increase in water temperatures in the Strait of
24 Georgia, surface water and deep water.
- 25 Q And so all these factors, the earlier than normal
26 and prolonged peaking of Fraser River discharge,
27 the increased sea surface temperature, increased
28 air temperature, are these all factors that are
29 linked to climate variability or climate change?
- 30 A Undoubtedly they are, you know, the -- I'm not an
31 expert in that, so...
- 32 Q Thank you. Now, your paper on pages 14 and 15,
33 you recommend some further monitoring and research
34 that you think needs to be done for your
35 hypothesis. And some of what you suggest could
36 include a direct sampling, automated molecular
37 monitoring and remote sensing; is that right?
- 38 A That's right.
- 39 Q And that could include satellite chlorophyll
40 tracking?
- 41 A Possibly, it -- satellite chlorophyll has never
42 really -- it's a difficult thing to use in the
43 Strait of Georgia because of the turbidity from
44 the river, but it's possible to use it if you had
45 some ground truthing.
- 46 Q Okay. And this could include fixed-wing aircraft
47 surveys, you suggest?

- 1 A Right. It's a unique thing about *Heterosigma* that
2 a trained observer who is experienced can actually
3 fly at 1,500 feet or 3,000 feet and see the bloom
4 and identify with pretty good veracity the
5 *Heterosigma* bloom, because there's a
6 characteristic colour that you see from the air.
7 And you actually don't even see that colour from a
8 boat, but you do from the air. And so what is
9 done in Puget Sound is that small planes go up and
10 chart the extent of the blooms in relationship to
11 the fish farms as a management tool, so they know
12 that they need to invoke mitigation.
- 13 Q Okay.
- 14 A And I've done a number of those flights.
- 15 Q And you also suggest that there could be studies
16 of acoustically tagged smolts to determine overlap
17 with and behaviour near *Heterosigma* blooms?
- 18 A I'm sorry, I didn't hear...
- 19 Q Sorry?
- 20 A Again I couldn't hear you. I'm sorry.
- 21 Q This also includes studies of acoustically tagged
22 smolts to determine overlap with and behaviour
23 near *Heterosigma*?
- 24 A Yes, thank you. The sort of thing that Dave Welch
25 does, that's right.
- 26 Q Right.
- 27 A Yeah, that's very important.
- 28 Q Right. And it could include genetic analysis of
29 *Heterosigma* as well, because you mentioned already
30 some of the different ecotypes.
- 31 A Well, we've made a lot of recent gains on that in
32 Washington State, and it's likely that that
33 information would be valid for the south Strait of
34 Georgia.
- 35 Q Okay. And you note that there are other algae
36 species in the Strait of Georgia that might be
37 worth considering in addition to *Heterosigma*, as
38 well.
- 39 A Yes.
- 40 Q Okay. And I'm just wondering, what would be your
41 estimate of some of the costs involved with
42 conducting all this research and monitoring that
43 you've suggested in your paper?
- 44 A I think that the costs could be -- the initial
45 monitoring is actually very inexpensive. I
46 hesitate to say a number, because that would be--
47 but the fact is that there is this algal bloom

Jack Rensel

Cross-exam by Ms. Grande-McNeill (CAN)

Cross-exam by Mr. Blair (BCSFA)

1 monitoring program in place, and if there were
2 protocols and chains of custody and so forth are
3 set up so that that everyone would follow the
4 same. The idea would be that different people
5 working in different areas would contribute
6 because they're already mobilized. The large
7 costs are simply getting to the area and getting
8 the sample, not working up the sample.

9 So for example, in the south Strait of
10 Georgia, someone from the University of British
11 Columbia, and they still are sampling in English
12 Bay every year for the newly emerged phytoplankton
13 *Heterosigma* that germinate, but they could use a
14 small boat and go out and sample. So and then
15 obviously at the Nanaimo Marine Biological
16 Station, that would be a good place to sample, and
17 someone could easily sample there. The samples
18 can be preserved or shipped fresh. So basically
19 just the basic monitoring is not expensive at all.

20 Q And what about some of the other research, for
21 example, the genetic analysis, the studies of
22 acoustically tagged smolts, over-flights,
23 laboratory studies on load of toxicity.

24 A Right. All those things run into the more serious
25 money, and some of those would be done through the
26 academic organizations that are -- that would be
27 skilled to do it, that would probably compete for
28 grants and contracts. And there's a place for
29 government in this, too, I'm sure, possibly.
30 Although it was apparently decided in 2006 that no
31 more harmful algal bloom was going to be done by
32 DFO.

33 MS. GRANDE-McNEILL: Thank you, those are my questions.

34 MS. BAKER: Thank you. Next we have Mr. Blair for 15
35 minutes.

36 MR. BLAIR: Mr. Commissioner, Dr. Rensel, Alan Blair
37 appearing for the B.C. Salmon Farmers Association.
38 Mr. Lunn, could you put up the Salmon Farmers' Tab
39 1, please.
40

41 CROSS-EXAMINATION BY MR. BLAIR:
42

43 Q Dr. Rensel, I'm assuming that you've had an
44 opportunity in your preparation for coming to the
45 hearings to look at some or all of the documents
46 that various participants have put forward?

47 A Actually not.

1 Q No?

2 A I'm in the thick of a -- we not only have toxicity
3 in Puget Sound, but in the Columbia River right
4 now, so I'm -- unfortunately business is booming,
5 or maybe I should say blooming for me.

6 Q I'm glad to be able to provide the opportunity for
7 you to use that line. I'll assume then perhaps
8 you've not read this document, and also for your
9 purposes I'll explain the context. This document,
10 as you can perhaps tell from the face sheet, is
11 questions and answers. It was specifically
12 prepared by my client, the B.C. Salmon Farmers
13 Association under the direction of a Dr. Tom
14 Watson, who is a Senior Environmental Biologist
15 with Triton, and a number of people who are
16 contributors.

17 Perhaps, Mr. Lunn, you could just pull up
18 this list of contributors at the bottom.

19 Some of those names if you can you see them,
20 might be familiar to you. This document was an
21 attempt by my client to answer in sort of layman's
22 terms some of the questions around the aquaculture
23 industry in British Columbia.

24 And Mr. Lunn, I wonder if you could look at
25 PDF 50, please, page 50. You'll see here in this
26 document, Dr. Rensel, the question is posed, as it
27 is throughout the entire piece, questions posed
28 and then answers provided, footnoted. And by the
29 way, question 55, which is:

30
31 Do farms cause *Heterosigma* blooms?

32
33 You'll note there's a reference, footnote
34 reference at 287, which is Dr. Ken Brooks' paper,
35 which is also indexed, and I'll refer to Dr.
36 Brooks' paper.

37 Firstly, do you know Dr. Ken Brooks?

38 A Yes, I do.

39 Q Yes, all right. Could you just read that -- that
40 answer to that question and let me know whether or
41 not you agree with that conclusion? It's really
42 the conclusion of Ken Brooks, and merely footnoted
43 in this document by Dr. Watson and his team.

44 A I guess I can't agree with it, no. It says that:

45
46 *Heterosigma* blooms occur naturally in shallow
47 bays with significant freshwater inputs and

1 minimal flushing.

2
3 But we know that *Heterosigma* covers entire basins
4 of Puget Sound and the Salish Sea and the Strait
5 of Georgia at times, so I can't agree with that.

6 It's true that it would be poor to have fish
7 farm sites in those shallow bays, and in fact they
8 were there in the '70s when I first started in the
9 field.

10 Just let me read the second paragraph.

11 Q I wonder before you get to the second paragraph --

12 A Okay.

13 Q -- we should break down the first paragraph.

14 There's two thoughts in the first paragraph. The
15 first is whether or not there's potential for
16 finfish to cause enhancements in phytoplankton
17 populations, and the conclusion of Dr. Brooks is
18 that that potential is "remote or non-existent".

19 A I would have to qualify my answer to say it
20 depends on where you're talking about. It's not,
21 you know, I wouldn't agree with that in there are
22 certain situations where it would be very likely
23 that it could contribute to them. And I don't
24 have any prime firsthand knowledge of the nutrient
25 sensitivities of the sites in British Columbia.

26 Q You're quite familiar with the aquaculture
27 industry in Washington State; is that correct?

28 A Yes.

29 Q And so in the context of your familiarity with
30 those particular sites, did you find correlations
31 between Washington State fish farms and the
32 enhancement of or the potential enhancement of
33 potentially harmful algal blooms?

34 A In Washington State the regulations that I work
35 with, the Department of Ecology helped develop
36 over 20 years ago, require that -- and the
37 Department of Natural Resources require that fish
38 farms be located in non-nutrient sensitive areas.
39 Those are areas where there are levels of nitrogen
40 which is usually the limiting factor are so high
41 that naturally from inputs from the ocean, that
42 other factors such as the availability of
43 sunlight, limit their population, as well as
44 advection or transport of the blooms mixing in
45 with the deep layer, those sorts of things. So in
46 Washington State, I could say that it would be
47 true, the first sentence would be possibly true.

1 But any time you put nitrogen in the sea, you can
2 never guarantee that that molecule of nitrogen
3 that you put in won't end up in an algal cell.
4 Usually it's a good cell, it's a beneficial thing,
5 but you can't -- there's no axiomatic no, no
6 effect.

7 Q Is it your conclusion looking at this over a
8 number of years that sunlight is a more
9 predominant trigger than nitrogen to the
10 stimulation of *Heterosigma* blooms?

11 A Sunlight is a requirement, of course, for most
12 algal blooms, and days when you have storms, a low
13 pressure front moving in, rain, you're less likely
14 to see a bloom initiate. But blooms have a way of
15 occurring unexpectedly any time of year.

16 Q So I think I hear you saying sunlight is a
17 requirement for the bloom and nitrogen is a
18 contributor, potentially?

19 A Nitrogen is another -- another requirement. Being
20 exposed and being in the right depth so that you
21 can take advantage of both, or being able to
22 migrate to the right layer, like *Heterosigma* does.
23 So it's a whole number of factors, and we have
24 developed conceptual models of why blooms occur.
25 And we know now, and we can actually predict very
26 well in Puget Sound within about a week when the
27 blooms are going to occur. If we know that
28 there's neap tides at certain time of the year,
29 because we know that the cysts are more likely to
30 be germinating and the time period of June, July
31 and again in September, those are high risk
32 periods. Like you said, the sunny weather helps.
33 Calm conditions sometimes help, but I've seen
34 blooms during wind events also. So there's
35 nothing really exact about it at this point, we
36 just -- but it's got to the point where the fish
37 farmers actually don't rely on the academic people
38 to do their predictions. They do them pretty much
39 on their own.

40 Q And that's because?

41 A That's because they know their sites and they know
42 where the blooms are coming from, usually from up
43 north in the border areas, and the south Strait of
44 Georgia, but also some of the small bays that are
45 along our coastline. And because they go out and
46 monitor by airplane and they track these things.

47 Q No counsel ever means to cut off a witness, but we

1 all have very tight time constraints so I'm going
2 to move along, if I may.
3 A Sure.
4 Q So the second sentence in that first paragraph,
5 you took exception to it, and I think you said,
6 well, *Heterosigma* blooms can occur across an
7 entire area, for example, Strait of Georgia.
8 You'll agree that that statement is true, that
9 they can occur in shallow bays, they can also be
10 system-wide, correct?
11 A That's right.
12 Q So the statement is true, but it should be taken
13 in the context of in addition to shallow bays when
14 they start, you mentioned English Bay in
15 particular, they can also spread across the entire
16 system.
17 A Yes.
18 Q And the next statement is also true:
19
20 These sites are considered poor locations for
21 fish farms.
22
23 In part because of poor flushing and perhaps the
24 likelihood of a bloom.
25 A Yes.
26 MR. BLAIR: I wonder whether we could mark that Tab 1
27 as the next exhibit, please.
28 THE REGISTRAR: Exhibit number 1366.
29
30 EXHIBIT 1366: Watson, Questions and Answers
31 on Salmon Aquaculture in British Columbia,
32 Volume 2, August 16, 2011
33
34 MR. BLAIR: And I have directed the witness, Mr.
35 Commissioner, to the footnote which is footnoted
36 in that exhibit now, footnote number 287, which is
37 also our Tab 2, a paper by Dr. Kenneth Brooks. I
38 wonder if that could also be marked the next
39 exhibit.
40 THE REGISTRAR: Exhibit 1367.
41 MS. BAKER: What tab is that in?
42 MR. BLAIR: It was our Tab 2.
43 MS. BAKER: Perhaps the witness could just identify the
44 document.
45 MR. BLAIR: Mr. Lunn, if you'll provide Tab 2.
46 MR. LUNN: It's on the screen.
47 MR. BLAIR: Oh, thank you.

1 Q Dr. Rensel, this was the -- this is the paper that
2 I said was footnoted in the last exhibit that I
3 referred you to. You indicated you're familiar
4 with Dr. Ken Brooks.

5 A Yes, and this appears to be a technical report.

6 MR. BLAIR: Thank you. The next exhibit, please.

7 MS. BAKER: I'm not sure that he's actually identified
8 that he knows anything about the report, he just
9 said it appears to be a technical report.

10 MR. BLAIR: Mr. Commissioner, we tendered the last
11 exhibit with the footnote and asked him, the
12 witness, specific questions around this, whether
13 he agreed with it or not, whether he knew Mr.
14 Brooks, and I think his answer has been that the
15 qualifications he's made with his own knowledge,
16 he knows Mr. Brooks and largely agreed with the
17 footnote that I referred to. So this is the
18 underlying document.

19 MS. BAKER: I don't think he actually agreed with it.
20 I think he qualified it quite extensively, and I
21 don't want to create a big issue, but if the
22 witness is going to identify this document and
23 it's being put in as a footnoted document to
24 another document that he hadn't read before he was
25 sitting in the witness stand, I'm not really sure
26 what the value of this is. My friend will be
27 participating in several weeks of aquaculture
28 hearings coming up. I'm sure that this document
29 that's now been marked will be tendered and
30 reviewed extensively in that hearing, and perhaps
31 that's a more appropriate time to deal with this,
32 as the authors, I'm assuming, will be present and
33 able to answer questions about what they relied on
34 and what they didn't rely on.

35 MR. BLAIR: We could perhaps do it that way, Mr.
36 Commissioner.

37 Q But if I could just for a moment direct Dr. Rensel
38 and Mr. Lunn to page 11 of the report, that is our
39 Tab 2, PDF page 25, page 11 on the actual paper
40 document. And, sir, right down at the second-last
41 paragraph, starting "Taylor and Horner", the very
42 last line ending with the words:

43
44 ...potential for net-pen enhancement of
45 phytoplankton populations is remote or non-
46 existent.
47

1 You see that line, do you, sir, just before the --

2 A Yes, I see the line.

3 Q Yes. Now, this is -- this is the quote that Dr.
4 Watson's Q&A referred to in Dr. Brooks' paper. Do
5 you agree with that statement that I've just
6 highlighted:

7
8 ...potential for net-pen enhancement of
9 phytoplankton populations is remote or non-
10 existent.

11
12 A No.

13 Q You disagree with that.

14 A For the same reasons I've stated before. I should
15 state, too, that Dr. Brooks is well-known in the
16 field of benthic ecology, that he has not
17 published in the field of phytoplankton dynamics
18 and harmful algal blooms.

19 THE REGISTRAR: Excuse me, Mr. Blair, I'm not clear
20 whether that last document was to be marked or
21 not.

22 MR. BLAIR: I'm going to withdraw our request to mark
23 it now and perhaps follow Ms. Baker's suggestion
24 that we put it to the Project 5 reviewers who will
25 most certainly have looked at it in greater
26 detail.

27 THE REGISTRAR: Thank you very much.

28 MR. BLAIR: Thank you. Mr. Lunn --

29 MR. LEADEM: Just before -- sorry, Mr. Blair, and I
30 don't mean to intrude, but I would actually think
31 that given the exchange and the actual passage
32 that was put to the witness and his not agreeing
33 with it, it ought to be marked so that we have
34 something in evidence that reflects this
35 discussion.

36 THE COMMISSIONER: I think we could mark it for
37 identification purposes, Ms. Baker and Mr. Blair,
38 and as you suggest, Mr. Blair, you'll deal with it
39 at another time.

40 MR. BLAIR: I'm agreeable to that, thank you.

41 THE REGISTRAR: The document will be marked as letters
42 "JJ", double "J".

43
44 JJ FOR IDENTIFICATION: Brooks, Stolt Canada
45 Arrow Pass Salmon Farm Benthic and Shellfish
46 Effects Study 1996 to 1997, 2001
47

27
Jack Rensel
Cross-exam by Mr. Blair (BCSFA)

1 MR. BLAIR: Thank you. Mr. Lunn, B.C. Salmon Farmers
2 Tab 5.
3 MR. LUNN: This is also Exhibit 1327, it's marked as
4 your Tab 5.
5 MR. BLAIR: Thank you. Oh, I'm sorry. I meant Tab 4,
6 pardon me.
7 Q This one might look more familiar, Dr. Rensel.
8 A Yes.
9 Q This is your document?
10 A That's correct.
11 Q And my question for you, and I'll refer you to
12 some specific passages in the document if
13 necessary, sir. But do you agree it's true that
14 the benthic impacts from salmon farms are now
15 fairly understood in terms of the -- the influx of
16 waste from salmon pens and their near field fate?
17 A I'm sorry, did you say the benthic impacts or...?
18 Q Yes. Yeah.
19 A It is fairly well understood, yes, and I'm
20 actually involved in computer modeling of that, so
21 I do a lot of work with it.
22 Q I wonder if we could go to PDF page 10, Mr. Lunn,
23 and starting with the paragraph just immediately
24 above the photo, this speaks to that very issue.
25 I think you're thinking, sir, but my question
26 was does this speak to that issue and does it
27 summarize your view? I've asked you to read the
28 paragraph starting "The flux of waste products
29 from".
30 A Oh, I'm sorry, I was waiting for you to pose a
31 specific question. I'm talking about Washington
32 State and where --
33 Q Yes.
34 A -- salmon farms are located again, so there's not
35 -- there's no change in my -- my position.
36 MR. BLAIR: Thank you. Could this be marked the next
37 exhibit, please.
38 THE REGISTRAR: That will be marked as Exhibit number
39 1367.
40
41 EXHIBIT 1367: Rensel and Forster, Final
42 Report, Beneficial Environmental Effects of
43 Marine Finfish Mariculture, 22 July 2007
44
45 MR. BLAIR: Thank you.
46 Q Can we go to Commission Tab 30, please. Dr.
47 Rensel, are you familiar with this submission by

August 17, 2011

1 Nicky Haigh?

2 A Yes, I am.

3 Q It's dated November 2010. My question relating to
4 this particular document, sir, is a question with
5 respect to how long some of the blooms have
6 lasted, and the likely impact on food webs, as
7 well as any direct toxic effects. And if the
8 witness could be shown pages 1 and 2.

9 MR. LUNN: Would you like those side-by-side, or...

10 MR. BLAIR: If you can, please, yes.

11 Q Just while it's being brought up, sir, on page 1
12 will be a quote from the Haigh document which
13 states:

14
15 The recurring and persistent HABS seen in
16 this area may be responsible for a great deal
17 of the low returns and decline of Fraser
18 River sockeye since 1989, and in particular
19 the disastrous return in 2009.

20
21 And that's the quote that we're looking for, which
22 is at the end of the first paragraph, and in a
23 moment on the other page...

24 MR. LUNN: I'm sorry, I thought you wanted full pages.

25 MR. BLAIR: I did. If we can just see the end of the
26 summary enlarged so we can read it to the left.

27 MR. LUNN: Do you mean like that?

28 MR. BLAIR: No, sorry, the end of the paragraph called
29 "Summary". Yes.

30 Q I'm trying to speed it up, sir, by reading that to
31 you. I'm not sure that I did. You now see the
32 sentence there just above the words
33 "Introduction", starting with "recurring and
34 persistent" --

35 A Yes.

36 Q -- "HABS".

37 A I'm sorry, yes, I do.

38 Q Yes. Do you agree with that statement?

39 A Yes.

40 Q I'm sorry, you said yes?

41 A Yes, I said yes.

42 Q Thank you. And if we went to on page -- the
43 second page, the paragraph starting:

44
45 During *Heterosigma* blooms, other algae and
46 most zooplankton disappear...

47

1 A Are you asking me if I agree with another sentence
2 here, or...
3 Q I'm trying to take us there.
4 A I believe I edited this document, that she sent it
5 to me for review, so I probably will say I agree
6 with things.
7 Q So that's a yes, again?
8 A I'm not going to give a blanket --
9 Q Okay. Then we'll --
10 A -- because I don't know exactly what she
11 submitted.
12 Q -- find the page, if I may. Wrong binder, my
13 apologies. Right where your little hand is Mr.
14 Lunn, if you'll expand that paragraph.
15 MR. LUNN: I can just take this full page, that would
16 be easier.
17 MR. BLAIR: Sure, that would be great. I'm never going
18 to ask you to display two pages again, Mr. Lunn.
19 You're doing it, but I'm being lost.
20 Q Now, sir, do you see the paragraph starting
21 "During *Heterosigma* blooms"?
22 A Yes.
23 Q Could you take a moment to read that and tell me
24 if you agree with it.
25 A Yes, I agree with it.
26 MR. BLAIR: Could this document be marked the next
27 exhibit.
28 THE REGISTRAR: Exhibit 1368.
29 MS. BAKER: Mr. Commissioner, this is a -- just by way
30 of process, these documents that we're looking at
31 right now is one that's been submitted to the
32 Commission on the website, so it has a Commission
33 document number already, and it is in evidence
34 through the public submission process. But so it
35 -- so we haven't been marking them as exhibits if
36 they're public submissions. We've just been
37 identifying them as the public submissions. So I
38 don't know if you want to -- our rules do state
39 that the Commissioner can rely on any public
40 submission in your -- in our findings, so we have
41 to date not been actually marking these public
42 submissions as exhibits, it's of course up to you,
43 what you choose to do.
44 THE COMMISSIONER: I would prefer that this be marked
45 as an exhibit, Ms. Baker.
46 MR. BLAIR: Thank you. Number, please.
47 THE REGISTRAR: That was 1368.

30
Jack Rensel
Cross-exam by Mr. Leadem (CONSERV)

1 EXHIBIT 1368: Submission to the Cohen
2 Commission, 0358-Haigh, Harmful Algae
3 Monitoring Program, November 2010
4

5 MR. BLAIR: Thank you. I think I'm out of time. There
6 are a few references in that document but now it's
7 marked an exhibit, I'm not going to proceed.
8 Thank you.

9 MS. BAKER: We could take the morning break, if you'd
10 like, and then Mr. Leadem will follow.

11 THE COMMISSIONER: Thank you very much.

12 THE REGISTRAR: The hearing will now recess for 15
13 minutes.
14

15 (PROCEEDINGS ADJOURNED FOR MORNING RECESS)
16 (PROCEEDINGS RECONVENED)
17

18 THE COMMISSIONER: Mr. Leadem.

19 MR. LEADEM: Thank you, Mr. Commissioner. Leadem,
20 initial T., for the record, appearing as counsel
21 for the Conservation Coalition.
22

23 CROSS-EXAMINATION BY MR. LEADEM:
24

25 Q Good morning, Dr. Rensel, and thank you for a very
26 interesting topic and an interesting paper.

27 A Good morning. Thank you.

28 Q I want to begin by looking with you at an email
29 that you sent to Dick Beamish. If I could have
30 Conservation Coalition document number 7, please,
31 and scroll right to the bottom when you get it,
32 Mr. Lunn. This is some time ago. This is in
33 August of 2009, but you recollect that you
34 contacted Dr. Beamish around that time, about the
35 work that that you were doing with respect to
36 *Heterosigma*; is that correct?

37 A Yes, that's correct.

38 Q And is that the first contact that you had with
39 anyone from DFO about the work that you had been
40 doing and the possible correlation between what
41 you were finding with the harmful algal blooms and
42 the decline in the Fraser River sockeye?

43 A Could I see the date on this again, please.

44 Q It's August 14, 2009.

45 A 2009. I may have given a talk or two at the PICES
46 meetings about the topic, I can't be sure, and DFO
47 is well represented at those meetings.

August 17, 2011

1 Q Right. Are you somewhat surprised, and I realize
2 that word is maybe loaded a little bit, but DFO
3 does not appear to be doing any work on harmful
4 algal blooms currently, and it, as I understand
5 it, it has done work on harmful algal blooms in
6 the past. Do I have that correct?

7 A Perhaps I'm disappointed, but I'm not surprised.
8 All agencies in North America seem like they have
9 limited funds these days.

10 Q But it strikes me that with the topic which is
11 very timely, such as the one that you've
12 uncovered, and particularly with reference to the
13 possible correlation between the decline of Fraser
14 River sockeye, that it's something that ought to
15 be researched here in Canada, presumably by DFO or
16 some other institution. Do I have that correct?

17 A That's my opinion, and my colleagues' that are
18 involved in the PSC from the U.S., I think, too.

19 MR. LEADEM: Could we have that marked as the next
20 exhibit, please.

21 THE REGISTRAR: That will be Exhibit number 1369.

22
23 EXHIBIT 1369: Email thread between J.
24 Rensel, R. Beamish, L. Richards et al re FRS
25 Mortality, Alternative Contributing Factors,
26 ending August 14, 2009
27

28 MR. LEADEM:

29 Q I next want to take you to your report, which is
30 Exhibit 1359, and this is more for my edification.
31 If I can look at Table 5 with you, because I'm not
32 too -- and maybe you can explain some things on
33 Table 5 to me.

34 A On page 106.

35 Q Thank you. If we look down, for example, at the
36 2008 data, and you've got it divided into columns
37 here. The "South Strait of Georgia bloom
38 occurrence or timing", and there's some numbers
39 there. For example, under 2007 it's "4-6" and
40 then "11-13". What do those correspond to?

41 A To the week of the period, I think it elucidates
42 what it is in the table legend. May 1 begins as
43 week 1 and then it goes on.

44 Q I see. Okay. So those are sequential weeks
45 beginning in your calendar year, which would begin
46 May 1 of that particular year.

47 A That's correct.

- 1 Q All right. The reference to data source of HAMP,
2 H-A-M-P, that would be the Harmful Algal
3 Monitoring Program, that's operated by Nicky Haigh
4 in Nanaimo; is that correct?
- 5 A That's correct.
- 6 Q And that program, as I understand it, is sponsored
7 or funded in part by the aquaculture industry in
8 British Columbia; is that right?
- 9 A I think it's funded entirely by them.
- 10 Q I'm going to now -- and I thank you for pointing
11 out what those numbers meant. I can now
12 understand that table a little bit more clearly.
13 I'm going to move from that table, and I hate to
14 be jumping around so much with you, Dr. Rensel,
15 but time is very precious in this, and I want to
16 move on to a different topic. And that's the
17 topic, and I think you've already expressed this,
18 that there are many factors that could potentially
19 trigger or bring into being a harmful algal bloom.
20 There are factors that you discuss, such as sea
21 surface temperature, salinity factors, water flow
22 that's in from the Fraser, and the particular
23 example of the south Strait of Georgia. But one
24 of the other factors that I would put to you that
25 we might be able to control is anthropogenic
26 nutrient loading; is that right?
- 27 A It's true that these anthropogenic nutrients
28 discharge into marine waters can be controlled.
- 29 Q Right. And that would be a factor that could
30 potentially trigger a harmful algal bloom, whether
31 its *Heterosigma* or *Cochlodinium* or one of the
32 other species; is that fair?
- 33 A In -- yes, in a nutrient-sensitive area as I've
34 defined.
- 35 Q Right. And the nutrient-sensitive area as you
36 defined, it's for that reason that the siting of
37 aquaculture farms is very critical, because you
38 would not want to site them in a nutrient
39 deficient area, because you might in turn sponsor
40 or trigger a harmful algal bloom, amongst other
41 things; is that fair?
- 42 A Not entirely, because actually society-wise, we
43 actually introduce nutrients on purpose to some
44 aquatic water bodies to enhance productivity.
- 45 Q Yes.
- 46 A For example, in Arrow Lakes and in other lakes in
47 British Columbia, for sockeye and trout

1 production, rather.

2 Q And that would be in the freshwater environment?

3 A That's right.

4 Q All right.

5 A But it's also done experimentally in the ocean
6 where iron is added, or nitrogen and iron, to
7 foster and to study the effects of carbon
8 sequestration of carbon from the atmosphere, so
9 that the -- we have to be careful not to say that
10 all nutrients are bad. Nutrients are the base of
11 the underlying -- one of the underlying factors
12 for the food web, and without them we have
13 impoverished seas.

14 Q Right. And I take your point. But I want to move
15 it a little step further and specifically
16 reference nitrogen and phosphorous loading from
17 anthropogenic sources such as we know, for example
18 from other testimony, and you may not be aware of
19 this because of your work south of the border, but
20 that there is a large sewage outfall from Iona
21 plant that goes right into the Strait of Georgia,
22 and obviously you're going to get some nutrient
23 loading of nitrogen and phosphorous from such a
24 source. And is it those kinds of anthropogenic
25 triggers or potentially anthropogenic triggers
26 that we should be careful about in terms of
27 harmful algal blooms?

28 A Yes, but I have to qualify and say that it may
29 well be that the -- in its present case with
30 *Heterosigma* with the ability to swim at one metre
31 per hour up and down in the water column, that
32 they have an unlimited supply of nitrogen by
33 simply going to the deep layer. And in other
34 countries where this has been studied that's shown
35 to be the case. We don't know what goes on in the
36 Strait of Georgia in terms of vertical migration.
37 And it also may be an advantage to have a
38 discharge that is buoyant, that even though you
39 put the discharge out at depth, it can rise to the
40 surface with the freshwater, and then the alga can
41 spend less energy migrating and more energy
42 dividing and growing.

43 Q And proliferating.

44 A Yes.

45 Q And blooming. Do I have it then that we -- if we
46 can control to some extent anthropogenic culturing
47 of harmful algal blooms, that we should do so,

- 1 that we should look, examine that, and try to
2 limit to the extent that we can, the anthropogenic
3 effect of -- upon these harmful algal blooms?
4 A If indeed it was shown that the -- the *Heterosigma*
5 is taking advantage of it, it does bring out the
6 concept of tertiary treatment for discharge of
7 nitrogen and phosphorous. But phosphorous is
8 largely removed with the solids already in
9 secondary treatment, but tertiary treatment, which
10 is practised in parts of Puget Sound that are
11 nutrient sensitive, such as Olympia, the Budd
12 Inlet, is expensive and -- but it can be done.
13 Q I just wanted to reference one of the papers that
14 I'd like to put to you, and it's an article, it's
15 a document, our document number 2, Mr. Lunn. Are
16 you familiar with this journal article, "Harmful
17 algal blooms: causes, impacts and detection",
18 that's written by Kevin Sellner and others?
19 A I know all these people, and Kevin's a good friend
20 of mine, but I haven't read this for years, so I'm
21 sorry, I'm not -- I'm sure I read it when it came
22 out.
23 Q All right. Well, I'm going to take you to a
24 certain passage in this article and see if you
25 agree or disagree with the authors. If I can ask
26 Mr. Lunn to pull up page 3 of that particular
27 article. The very last paragraph on that page
28 begins with the sentence:
29
30 There is increasing discussion on the
31 potential role of aquaculture and mariculture
32 in HAB development.
33
34 And then it goes on to describe:
35
36 Cultured shellfish and finfish populations
37 produce huge amounts of feces, pseudofeces,
38 and other excretory products right in
39 [nitrogen] and [phosphorous] important to
40 algal growth.
41
42 If I could just ask you to read the rest of that
43 and once you've finished, at the end of the page,
44 I'll ask Mr. Lunn to turn the page for us
45 electronically so you can finish the sentence.
46 A Yes, could you turn the page, I guess.
47 Q I don't need to know about Spanish rias. Perhaps

1 you can stop when you reach the sentence saying
2 however, or "Several HABS in Spanish rias".

3 A Okay. I've read what Kevin and colleagues wrote
4 there.

5 Q Can I ask you if you are in substantial agreement
6 with what is written there.

7 A Could I scroll back up to the first part again.

8 It's true that algae don't differentiate a
9 source of nitrogen or phosphorous, depending on
10 this, whether it's in the case of nitrogen, urea
11 ammonia or nitrate, they don't differentiate
12 except for what their physiological requirements
13 are. So that you can, and you indeed when you
14 discharge nitrogen or phosphorous into any aquatic
15 water body, you can't say that the nitrogen and
16 phosphorous won't be incorporated in beneficial or
17 harmful algae.

18 I think Kevin's parenthetical statement about
19 "30% of the added fish food is harvested as fish
20 biomass", is misleading because it implies that 70
21 percent goes to the bottom, and so forth, and I
22 don't think he had it right there. The numbers
23 are off quite a bit.

24 Q Okay. But other than that qualification, you
25 would basically agree with what's written there?

26 A Yeah. Yes, I would.

27 MR. LEADEM: Could we have this marked as the next
28 exhibit, please.

29 THE REGISTRAR: Exhibit number 1370.

30

31 EXHIBIT 1370: Sellner et al, Harmful algal
32 blooms: causes, impacts and detection, July
33 30, 2003

34

35 MR. LEADEM:

36 Q Now, my last set of questions to you will be on
37 the topic of how *Heterosigma* can potentially
38 interact with the disease factor to cause
39 lethality in Fraser River sockeye. And I'll start
40 off with the general proposition and maybe work
41 down from there. Would you agree with me that
42 it's potentially -- that there's a potential
43 amplification of the effect of *Heterosigma* upon
44 the gill tissue that you've observed, with
45 bacterial infection of some sort, so that that in
46 other words, if you have both of them acting upon
47 the gill membrane of a fish, that you're likely to

Jack Rensel

Cross-exam by Mr. Leadem (CONSERV)

Cross-exam by Mr. Rosenbloom (GILLFSC)

1 see a synergistic or even a lethal effect occur?

2 A I agree that cumulative effects of harmful algae
3 and other disease -- and diseases do occur and
4 have been shown and demonstrated in the literature
5 and that the example you just talked about, a
6 bacteria often of a harmful algae could compromise
7 the gills' surface, the epithelium layer, which is
8 very thin, one cell thick, and then the fish is
9 exposed to pathogens that are common in the
10 environment that normally are excluded by the
11 healthy gill tissue. So, yes, it's not uncommon.
12 I talked about that in the paper.

13 Q Yes, and I understand you did talk about that. If
14 it's demonstrated sometime during these hearings
15 that there's evidence of a disease, or a disease-
16 like factor, whether it's a retrovirus or a
17 bacteria, that may be contributing to the
18 mortality of the Fraser River sockeye, do you see
19 that the combination of a one-two punch, as you
20 called it, of a harmful algal bacterial bloom and
21 a disease would potentially bring about an acute
22 lethality in the large population of the Fraser
23 River sockeye. Could it be that what we're
24 looking at is contributing, are contributing
25 factors here.

26 A Well, yes, I think I stated earlier that I would
27 be looking for a combination of factors, not a
28 single factor.

29 Q Right. And so in isolation the harmful algal
30 blooms may not be the factor behind the decline of
31 the 2009 sockeye return to the Fraser River, but
32 it's certainly in your mind one of the factors
33 that has caused that decline, is that fair to say?

34 A That's fair to say.

35 MR. LEADEM: All right, thank you, those are my
36 questions.

37 MS. BAKER: Thank you. Mr. Rosenbloom is next.

38
39 CROSS-EXAMINATION BY MR. ROSENBLOOM:

40
41 Q Dr. Rensel, my name is Don Rosenbloom. I appear
42 for Area D gillnet, Area B seiner, two of the gear
43 types obviously fishing commercially on the B.C.
44 coast. I find your evidence, Dr. Rensel, both
45 intriguing and sobering. I have a few questions
46 for you in terms of the opinions you hold, and
47 whether -- and your attitude about how the

1 Canadian government and the Department of
2 Fisheries is handling the opinions and theories
3 that you have been advancing over some time.

4 To lead into that, I wish to refer you to two
5 emails that are not in evidence as of yet, but
6 because these are emails of which you are not a
7 signatory, or even a participant, I will invite
8 these two documents to go into evidence as
9 identification, and then when the authors of these
10 emails come forward, I will be cross-examining on
11 them. I'm referring, Mr. Lunn, to email Canada
12 354074, which found both in our exhibit, intended
13 exhibit list, but also on Exhibit document 6 of
14 the Conservation Coalition's list of documents.
15 And just before inviting your comment, and I'll
16 direct you directly to the passage, Mr. Lunn, if
17 you would also have available a second one, which
18 is Canada 096611, which is on our document list
19 and also the Commission's number 4 in the
20 Commission's list of exhibits. Thank you.

21 Having those two documents and dealing with
22 the first of those, which is at the top an email
23 from a Robin Brown, who will be testifying here,
24 to a group of individuals, he says in part in
25 2006, and I read:

26
27 The last messaging I have received on this
28 from the NSSDC is that toxic algal blooms are
29 NOT A PRIORITY ISSUE for DFO Science. With
30 fewer staff and smaller budgets, we must
31 avoid the temptation to "dabble" in fields
32 that are considered to be low priority and
33 for which we really don't have the resources.
34

35 Now, that's a statement from Robin Brown, Manager,
36 Ocean Sciences Division, back in 2006.

37 I then lead you to the second document I made
38 reference to. Again Mr. Lunn will put it up.
39 Again from Robin Brown. This dated in 2009, an
40 email to an Edward Black. He says:

41
42 Ed: Jack Rensel has developed the material
43 he presented at PICES. Could you look over
44 this ms and let me know what you think? I
45 realize that toxic algae is a banned 9 (sic)
46 or at least unpopular) topic in DFO, but this
47 will get some airing in the upcoming inquiry.

1

2

I presume that's our inquiry.

3

4

5

6

7

8

9

A

I'd have to say that in 2006 when the first email was written that I probably would have agreed that with the decision not to be involved as much as they had previously. I know Robin Brown and I've talked to him about this a number of times, and I don't see anything here that if Robin has been deeply involved in the PICES meetings and he's been involved in our Harmful Algal Bloom meetings since then. So I think that everyone's awareness of the problem has increased since we published our paper and I've been talking about it, and people are considering it now.

10

11

12

13

14

15

16

17

18

19

20

21

Q

What about the 2009 communication, what do you take from a Department of Fisheries, that from at least an official of the Department of Fisheries who speaks about this topic being banned within DFO.

22

23

24

25

26

A

I can't speak for them. I don't know what he means by that.

27

28

Q

It disappoints you, doesn't it?

29

A

Well, it does disappoint me, and I asked Laura Richards after I gave my presentation in Nanaimo if they were interested in following up, and she simply told me that they had decided previously not to be involved in harmful algae, and she wouldn't elaborate and didn't -- I'm sorry, she didn't elaborate.

30

31

32

33

34

35

36

Q

And when was that conversation, approximately?

37

A

That was in June of 2010.

38

Q

Thank you. Now, you being an American and doing work also in the United States, has the American Fisheries officials, both federal and state, been more receptive to appreciating the significance of the findings you have been publishing in respect to correlation of the algae blooms and the decline of stock?

39

40

41

42

43

44

A

No one's been showering research money on me or my colleagues, although we do have a nice grant and that probably helped through this work for NOAA,

45

46

47

- 1 actually got a grant from NOAA to do work on the
2 actual mechanisms of mortality of *Heterosigma* on
3 salmon. And there are three research groups in
4 our state, academic and government, that are
5 continuously working on *Heterosigma* issues. So
6 that there is a higher -- presently a higher level
7 of interest. I also note that on the East Coast,
8 I work a fair amount with people in DFO in New
9 Brunswick, and there is a fair amount of work with
10 harmful algae there, and at least one person
11 that's considered an expert there that does that
12 sort of thing.
- 13 Q And when you speak of New Brunswick, are you aware
14 whether DFO is funding research on the East Coast
15 of Canada in respect to these issues?
- 16 A Not presently. They have in the recent years,
17 though, I can't speak on...
- 18 Q Yes. And internationally, outside of Canada and
19 the U.S., you've spoken about your involvement
20 with scientists in Asia and so on and so forth.
21 Is there a greater cognizance or appreciation or
22 sensitivity to these issues?
- 23 A Usually a society reacts after a major event and
24 gets very interested in it. And particularly if
25 people die, which is not uncommon, of course, with
26 some of the blooms, and through shellfish
27 contamination.
- 28 Q Yes.
- 29 A So when I first started in the field, the
30 international meetings would have a few people, a
31 few, maybe a few hundred, and now there's
32 literally thousands that come. So it is a growing
33 field, unfortunately, it does reflect the times.
- 34 Q It's very regrettable, is it not, Doctor, that
35 since 2006 or 2004 DFO has not been funding
36 research in respect to this matter on our West
37 Coast?
- 38 A Well, again, to be fair to DFO, they -- I don't
39 think anyone was thinking along these lines in
40 2006, '07, '08, or maybe even '09.
- 41 Q All right. But they are thinking on these lines
42 currently, aren't they, to a certain extent?
- 43 A As part of the evidence I asked for some emails
44 that were of record, and I have read through them,
45 and I see that other people are definitely
46 discussing it, physical oceanographers, biological
47 oceanographers, everyone is.

40
Jack Rensel
Cross-exam by Mr. Rosenbloom (GILLFSC)

1 Q And let me drill directly on that point and I wish
2 to put before you, sir, document number 20 on the
3 Commission list, which is a briefing document from
4 our Regional Director General of DFO here in B.C.,
5 Pacific Region. Have we got that?

6 MR. LUNN: I'm just pulling it up now.

7 MR. ROSENBLOOM: I apologize, just one second. The two
8 exhibits that I had referred to that I wished to
9 have marked for identification, could those first
10 be marked. Thank you.

11 THE REGISTRAR: Which one...

12 MR. ROSENBERGER: I am speaking of document Canada
13 354074, and 096611, and they were up on the screen
14 a moment ago and the witness was speaking to those
15 two documents.

16 THE REGISTRAR: The first one will be marked for
17 identification "KK", and the second will be "LL".

18

19 KK FOR IDENTIFICATION: Email thread from
20 Robin Brown to Jim Gower and others, August
21 8, 2006, CAN354074

22

23 LL FOR IDENTIFICATION: Email thread from
24 Robin Brown to Edward Black, December 15,
25 2009, CAN096611

26

27 MR. ROSENBLOOM:

28 Q Thank you. Now, I was about to refer you to what
29 is document 20 in the Commission's list, which is
30 a briefing document to the Deputy Minister, Claire
31 Dansereau from our Regional Director General
32 Farlinger here in British Columbia. Do you have
33 that in front of you now? If you would turn to
34 page 3 -- excuse me, actually page 40 of that
35 briefing document. And this is a document dated
36 June the 16th of this year, 2011, so very recent.
37 I want to ask you, Doctor, whether you agree with
38 the author's briefing to the Deputy Minister where
39 at the bullet, the top third of the page:

40

41 • Based on the most recent analyses, the
42 following factors most likely led to sockeye
43 mortality at the scale observed in 2009:

44

45 And I take you down to the four theories, the four
46 factors, of which the fourth is:

47

1 Toxic algal blooms in the Strait of Georgia.

2
3 It then reads:

4
5 Although data are limited, additional
6 analyses by a US researcher support the
7 presence of extensive blooms of toxic algae
8 in the Strait of Georgia in 2007 when
9 juvenile sockeye were present.

10
11 Can I assume obviously you endorse that paragraph
12 and placing your topic or that factor under the
13 category of most likely having led to the decline
14 in 2009?

15 A Could you scroll up again to the top of the four.

16
17 Based on the most recent analyses, the
18 following factors most likely led...

19
20 So we're talking about any one or all these
21 factors combined.

22 Q Yes.

23 A Yes.

24 Q And you would agree with that.

25 A Right. I thought the evidence actually in 2007
26 was very strong and not limited, in comparison to
27 the other sources of data.

28 Q Right. And when they refer to a U.S. scientist, I
29 presume that's likely you.

30 A Perhaps.

31 Q Perhaps. Now, Doctor, accepting, endorsing what
32 is here in a briefing note to the Deputy Minister,
33 what do you believe the Deputy Minister should be
34 directing DFO to initiate in the way of programs
35 at this moment in light of this briefing note,
36 other than what you've already spoken about, about
37 further monitoring and so on. What else would you
38 suggest?

39 A Well, there needs to be a core individual or group
40 of individuals who focus on harmful algae on
41 behalf of the wild fish, and that could be
42 incorporated into the shellfish research, too,
43 because that's, as you may know, you have a new
44 species of shellfish toxin producing algae,
45 *Prorocentrum* and that sickened 50 people a couple
46 of weeks ago, and we don't really have anybody
47 tracking those things specifically. And the

1 Department of Fisheries and Oceans have many
2 talented and excellent biological and physical
3 oceanographers and there's no shortage of people
4 to do this work, but they're not doing it
5 presently.

6 Q Money's an issue.

7 A Apparently. I can't speak for DFO, of course.

8 MR. ROSENBLOOM: I appreciate that. I wonder if this
9 document, the briefing note, could be marked as an
10 exhibit, please.

11 THE REGISTRAR: Exhibit 1371.

12

13 EXHIBIT 1371: Briefing Memo for the Minister
14 re Update on Factors Affecting the 2009
15 Fraser River Sockeye Return (For
16 information), June 16, 2011

17

18 MR. ROSENBLOOM:

19 Q You spoke in response to Mr. Blair in his
20 examination or cross-examination of you about the
21 fact, and please correct me if I misstate your
22 evidence, that with the U.S. fish farms, that they
23 are strategically located in non-nutrient
24 sensitive areas of the state. Do I have your
25 evidence correctly?

26 A That's correct. You can't get a -- you can't get
27 a lease without doing that.

28 Q Okay. Could I ask you whether that also applies
29 as a strategy in British Columbia in terms of the
30 placement of the fish farms here?

31 A I don't have any direct knowledge of all the
32 different 80-some fish farms in British Columbia,
33 so I can't speak to that. But I can speak to the
34 important point that the worst place for
35 *Heterosigma* by far, and it was shown in our paper,
36 and that's not speculation, it's true, that the
37 south Strait of Georgia is the problem area
38 primarily, apparently, and there are no commercial
39 fish farms there, of course.

40 Q Yes. The last area that I wish to cover with you
41 relates to what remedial steps government should
42 take in respect to algae bloom growth within the
43 state's waters, within the country's waters. I
44 have read some of the material for this section of
45 our examination, but I see nothing, Doctor, in
46 respect to what remedial opportunities are there,
47 what remedial steps should be taken by government

1 to remove algae blooms. There was some exchange
2 between you and Mr. Leadem about what are the
3 causes of the growth, but I want to ask you is
4 there dredging equipment that is available? is
5 there some sort of procedure that can at least
6 mitigate the dangers that you speak about in your
7 evidence?

8 A It's a topic that is of high interest that I'm
9 involved in internationally, the mitigation of
10 harmful algal blooms, which include prevention of
11 them, foremost. But after you have them, how --
12 what kind of a treatment can you apply. The
13 Chinese, the Koreans, other countries are making
14 rapid advances on this. There's actually small
15 amounts of naturally occurring clays that are
16 mixed in a slurry can be spread on the water, very
17 small amounts, don't think in terms of dump trucks
18 loads per cubic metre, but small amounts spread
19 discretely, can flocculate blooms out of the
20 water, kill the blooms. And in the case of
21 *Heterosigma*, I published a paper on it and I
22 pointed out that since there is no persistent
23 toxin that we know about, that you're not
24 transferring the problem from the water column to
25 the benthos, to the bottom, you're simply removing
26 it from the water column.

27 So I may have talked about it in the paper, I
28 forget, if you had a strategy were you knew, for
29 example, English Bay is a source for the South
30 Strait of Georgia, there may be many sources or
31 not, we don't know. But you -- if I'm monitoring
32 the weather conditions and the time of year, you
33 could treat with small amounts of clay and remove
34 much of the bloom. And the Koreans have done this
35 on a very large scale.

36 Q Successfully?

37 A Successfully, yes, and their priority, however, is
38 farm fish over wild fish, and I think everyone
39 would agree that it's -- the farm fish -- farms
40 can be moved, farm fish are important, too, so
41 apparently to the economy and to -- for a good
42 food source for people. But, you know, we're
43 interested in North America especially in
44 protecting the wild fish.

45 Q Are you aware whether DFO is even knowledgeable
46 about this -- these advances by the Asians in
47 respect to the removal of the blooms, and if you

- 1 do, and whether you know of their attitude in
2 respect to it if they do know about it.
- 3 A Actually, the best scientific work was done by my
4 colleagues at Wood Hole Oceanographic Institution.
5 The Asians are simply applying it in large scale,
6 and so that there is a lot of interest in North
7 America and I'm sure that the Jennifer Martin, who
8 is the DFO harmful algal blooms scientist in New
9 Brunswick, is well aware of these. I've been on
10 panels with her and written papers with her
11 before, and I'm sure she's aware of it. But again
12 don't know of an individual in British Columbia
13 who is considered the harmful algal blooms
14 scientist for DFO.
- 15 Q If some of this technology has already proven
16 successful, for example, in Korea, do you
17 recommend that the Canadian government move
18 quickly to investigate and to apply this
19 technology in Canada?
- 20 A Well, I would recommend that it be investigated,
21 but we have to learn more about the spatial and
22 temporal occurrence of the algae and where are the
23 cyst beds, are they, you know, is this a thing
24 that if you don't treat one area, and you have
25 many other areas, maybe it's not possible to nip
26 it in the bud.
- 27 Q Yes.
- 28 A So there is a lot left to be learned.
- 29 Q Back to the shortage of data.
- 30 A You couldn't treat the Strait of Georgia with
31 clay. It would require mountains of clay.
- 32 Q And in any event, there is a shortage of data here
33 in B.C. in terms of taking it to the next step.
- 34 A Yes.
- 35 MR. ROSENBLOOM: Thank you. No further questions.
- 36 MS. GAERTNER: Good morning, Mr. Commissioner, it's
37 Brenda Gaertner and with me Crystal Reeves, for
38 the First Nations Coalition. Just as a short
39 aside, I was observing in this late August that
40 we're not -- we're still at the mouth, but I
41 understand we're at the beginning of the final
42 push, so we must be coming up the river soon and
43 returning to the spawning grounds, the end of this
44 inquiry. And here we are in the marine.
45
46
47

1 CROSS-EXAMINATION BY MS. GAERTNER:
2

3 Q I spoke briefly with you about the clients that I
4 represent, Doctor, and I just have a few
5 questions. My clients are interested in making
6 sure that as much information about all of these
7 understandings, if we're going to call them that,
8 are available to be used and I want to ask you
9 more about the data and some of the data
10 collection that you did with respect to this, and
11 also the location of what you found, based on the
12 data that you found. It seems to me you did
13 mention that the Strait of Georgia is of some
14 concern, but my reading of this document has it
15 that the *Heterosigma* blooms are located much
16 north, further north than that, and so that there
17 is a potential that that could continue to be a
18 problem as we go further north. And then just
19 briefly a couple of questions about precautionary
20 approaches.

21 And so let's start with data. As I
22 understand this, and it became clearer in Mr.
23 Leadem's evidence, that the data that you relied
24 on included any data that was useful to you when
25 DFO was still doing this work in 1999 to 2004, but
26 also the work that the aquaculture industry has
27 been responsible for gathering from 2004 forward.
28 Is that correct, you had access to all that data?

29 A Well, let's be precise, please, because --

30 Q Yes, please.

31 A -- they actually just collect samples, and the
32 independent scientist Nicky Haigh, who is the
33 contractor for them, does the analysis. And also
34 I'd like to clarify, we had no data collection,
35 any sample sources from the central and northern
36 Strait of Georgia, and Dick Beamish was confused
37 about that. So we don't actually know what was
38 going on during these years in those areas. We do
39 know about the south Strait of Georgia and we know
40 about the water conditions because those waters
41 are moved south with the estuarine flow, right
42 into north Puget Sound, where they do cause
43 problems in fish farms and where we respond to it
44 with measuring and monitoring.

45 Q And as all of these places are along the migratory
46 route of Fraser River sockeye salmon, or many of
47 them are, there is of course a concern that as the

- 1 weather changes, or all the variables that occur,
2 these blooms could begin to expand into other
3 areas, correct?
- 4 A Yes.
- 5 Q Yes. So the information that you received from
6 Nicky Haigh for your article and for this work is
7 the information the aquaculture industry has been
8 collecting and providing to her; is that correct?
- 9 A No.
- 10 Q No?
- 11 A Again, they collect samples. That's not
12 information.
- 13 Q All right.
- 14 A They take the samples, they don't know what's in
15 them. They -- as far as I know, because I have
16 not worked for or communicated with them directly
17 in British Columbia. But if it's like Washington
18 State, in Washington State, actually, the fish
19 farmers do their own analysis on site, and look
20 for the harmful algae. But in this case, I
21 suspect that some do and some don't. At least
22 these samples are preserved and sent to Nicky, she
23 does the counts, and then that's where we started
24 comparing her data with my data, and seeing the
25 correlations between them.
- 26 Q And that was stepping off information that you
27 used for the conclusions you've made as it relates
28 to recent algae blooms in B.C. waters or Salish
29 Sea?
- 30 A We haven't made any hard and fast conclusions, but
31 this is a hypothesis and it's still just
32 correlation, so but it's a good one.
- 33 Q How is it that you got access to this data? From
34 my understanding of the PPR that was filed, and I
35 can take you to paragraph 178 of PPR19, if I may.
36 This is propriety data of the aquaculture
37 industry, and so I'm just wondering, you know, is
38 it -- can anybody get the access to the
39 information that Nicky's collecting, or is it just
40 by permission? What protocols did you use? What
41 was necessary to get access to this information?
- 42 A The protocols are discussed in the paper as far as
43 the sampling and --
- 44 Q Sorry, I missed that, what...
- 45 A The methods cover how the sampling was done and to
46 some extent. I can't speak for Ms. Haigh about
47 whether or not you can have the raw data.

1 Q But you've got the data.

2 A Yes, I have the data, and I -- first I took her
3 summaries and when I saw that there were strong
4 correlations, I actually asked for the individual
5 data. And some of them belong -- well, the south
6 Strait of Georgia data she collected on her own.
7 She used to be a DFO employee who worked at the
8 Pacific Biological Station. She was used to going
9 down and collecting data in those areas, and she's
10 -- in many years she did, and I asked her, well,
11 why did you miss a few years, and those could have
12 been key years. And she just said, well, we were
13 busy in certain years and there was no -- no hint
14 that there would be a wild fish connection here,
15 so there was no necessity.

16 Since we've been doing this, she's still out
17 there collecting in the south Strait of Georgia at
18 her own volition.

19 Q Would it be an accurate next step to say that if
20 data was being collected, not only with fish farms
21 in mind, but fish farms and the migratory route of
22 Fraser River sockeye, or other salmon species,
23 that we might have more concerns about the
24 location of these blooms in other places within
25 the coast.

26 A Could you restate that question, I'm...

27 Q Your data, as I understand it, relies on the data
28 that Ms. Haigh collected, and your -- this article
29 that you have in front -- that we have in front of
30 you, Exhibit 1359, which is the summary of the
31 most state of your thinking, as I understand it,
32 in addition to the affidavit that we have, around
33 the location of the blooms in the -- in the Salish
34 Sea and otherwise.

35 A Okay. If I can address that. If you look in
36 Table 5 under my -- our publication, there's a
37 number of data sources, including DFO,
38 publications before in 1990s, and the information
39 that I've published and collected in north Puget
40 Sound. So it's not solely limited to the HAMP
41 algal bloom monitoring program.

42 Q But the most recent stuff is.

43 A No, we are also still looking at fish mortality in
44 north Puget Sound. That's a key component. If
45 you have dying fish, both wild and farmed fish,
46 that's the forensic evidence you need to say
47 something's going on. And the HAMP data doesn't

- 1 tell me that there were dying fish at some point.
2 It just tells me that there were cell counts of
3 certain -- certain species.
- 4 Q Right. And if I then go to page - sorry, I'm
5 jumping around this document - in Exhibit 1359, at
6 section 7, which is on page 103 of the actual
7 document, you're summarizing where the bloom in
8 the sampled regions in British Columbia waters was
9 located, the bottom of the page under the first
10 paragraph 7.1, and the level of occurrence. And
11 it's actually located in all of the areas that
12 that -- in which the samples were taken, correct?
- 13 A That's right.
- 14 Q So it is located in all the regions that are
15 summarized, and over the page in Table 3, you have
16 Regions A through D have the bloom located
17 throughout all of the areas; is that correct?
- 18 A That's correct. And if I may, the bloom is
19 universally later, except for the year 2007 on --
20 after the juvenile fish have left the area. So
21 that's a key consideration. As I said earlier,
22 this is all about timing.
- 23 Q Yes. And there is a section that you've also
24 raised concerns around adult returning salmon and
25 the bloom, correct?
- 26 A That's correct.
- 27 Q And that would be in later times in some
28 circumstances, correct?
- 29 A And I pointed out that we -- our sampling areas
30 weren't necessarily as good for adults as they
31 were for juveniles. The juveniles tend to follow
32 the shoreline. The adults can swim, and do, right
33 down the middle of the Strait of Juan de Fuca, for
34 example, in large schools, and so they're, you
35 know, we had a correlation but it wasn't -- it was
36 numerically strong, but not statistically
37 significant, it was .0, an alpha .07, instead of
38 the limit is usually set at .05.
- 39 Q Would you agree with me that for those that are
40 concerned about the impact of this bloom on wild
41 stock, that it would be useful to continue to have
42 access to the aquaculture industry's sampling
43 process?
- 44 A So the question is --
- 45 Q Would it be useful to --
- 46 A -- should you have, should the public at large
47 have access to it?

1 Q Yes.

2 A I don't know, that's a societal decision in
3 British Columbia. I would think that more
4 information is good.

5 Q Is it available in Washington State?

6 A To the extent that I've tried to publish it in
7 technical reports for NOAA and other people. The
8 fish farmers in Washington State are rather open
9 about the blooms and when they occur, and they do
10 news interviews, and so forth.

11 Q Thank you. So that would be a useful next step in
12 harmonizing some of this data and getting, moving
13 forward is to make sure that the data - the
14 samples that are collected are used by those that
15 could use that information wisely and the looking
16 after Fraser River sockeye salmon.

17 A I believe I looked at an exhibit from Ms. Haigh
18 who has stated -- when she stated that essentially
19 there should be a broader program to that end
20 where everyone has access to the data.

21 Q The next question that I had is around this - I
22 suppose that maybe I'll just say it more directly
23 - scientists and perhaps lawyers are often
24 interested in making sure we have causations
25 firmly determined. Aboriginal people want to make
26 sure that they can have access to healthy sockeye
27 salmon for many generations into the future. And
28 so waiting for causation to be absolutely proven
29 may be too late. And so we're looking at what
30 precautionary steps could be taken now in
31 ecosystem-based management, and I wonder if you
32 have some suggestions around precautionary steps
33 that could be taken as it relates to algae bloom
34 in Pacific Coast waters, in this case, waters
35 along the migratory route of the Fraser River
36 salmon.

37 A Well, first of all, I don't think we're talking
38 about toxicity of the fish to the consumers.
39 We're talking about the populations, preserving
40 the populations.

41 Q That's right, because they want to fish in future
42 generations.

43 A That's right. That's their culture. So I've
44 tried to identify in the paper a number of
45 different steps that could be taken. And I've
46 discussed, starting with the monitoring, but also
47 more sophisticated forms of monitoring, remote

1 sensing, molecular studies, that where you have
2 remote buoys that sample these things on a routine
3 basis. There's a number of tools, and the first,
4 in order to -- you're asking me if we should move
5 ahead with mitigation without understanding, and I
6 think that that might be dangerous.

7 I think we need to as rapidly as possible
8 understand the extent of the problem, if the fish
9 are actually -- it should be relatively easy to
10 locate a bloom and to bring in fish in live cages
11 and expose them and do that repeatedly in the
12 lower Strait of Georgia, for example. So it's not
13 -- once people will understand that farm fish and
14 wild fish have shared physiology and that one is
15 being affected and not the other is pretty
16 unlikely. I think that more progress would
17 follow.

18 Q Thank you. Just one final question in this is
19 more around ecosystem approaches to the Strait of
20 Georgia. If I could go to Exhibit 812, it's at
21 Tab 6 of our list of documents. And you will
22 likely not have had a chance to read this, and I'm
23 just going to take you -- it's a DFO document on
24 developing a framework for Science support of
25 ecosystem approaches to the Strait of Georgia.
26 And I just need to understand, if you go to page 5
27 of the document, there's a discussion on
28 "Anthropogenic Stressors", and over -- that's
29 perfect, actually, thank you.

30 So you see at the bottom is the title is
31 "Anthropogenic Stressors" and you see on the next
32 page they discuss two classes of potential
33 stressors under that, one that they call "natural"
34 and the other "direct". And natural are defined
35 to include environmental variability and shorter
36 to longer time scales, as well as secular
37 environmental changes, and then there's the direct
38 anthropogenic stressors. And when I was reviewing
39 this for the purposes of your evidence, and
40 looking at the ecosystem-based management
41 approaches that our clients -- my clients are
42 pushing for, I wasn't clear how we would classify
43 and what we would -- where we would place harmful
44 algae blooms.

45 And so I'm wondering if you could take a
46 moment to look at that and help us understand when
47 doing ecosystem-based management in the Strait of

- 1 Georgia and otherwise, how you would classify that
2 and how you would address it.
- 3 A Could you scroll down, please, to the table.
4 So the question is, what niche would you put
5 it in. It's a combination of natural and possibly
6 anthropogenic and we don't know the mix at this
7 point. Thank you. So that's about as far as I
8 could go. And then within the -- within either
9 category it is a marine ecology issue.
- 10 Q And so the approach to that stressor, whether it
11 will require both a total system approach and
12 perhaps a very specific approach once we can
13 identify clearly whether things like the clay or
14 the mud could work.
- 15 A You trailed off at the end there, I didn't hear
16 that (indiscernible - overlapping speakers).
- 17 Q I'm sorry. So the approach that we would use is
18 both a total systems approach, a total systems
19 approach looking at it from that point of view,
20 but also a very specific approach, if the research
21 provided support for mitigation efforts like you
22 were suggesting.
- 23 A Yes, I would say that.
- 24 Q Commissioner, I learned just this morning
25 actually, I regretted to note that Dr. Rensel has
26 also been a biologist who was actively involved in
27 implementing the Boldt decision for the tribes in
28 the States, and so I won't endeavour to ask too
29 many questions, because I just learnt it. But I
30 did want to ask you whether you agreed with this
31 observation, and I have observed the work that was
32 done in Boldt in the States and otherwise, that it
33 takes a lot of patience to implement the kinds of
34 change that the Boldt decision imposed in
35 Washington State, and that mistakes are made and
36 errors are made and we need to go forward in order
37 to balance that negotiating table and the
38 management decisions around that.
- 39 A You could do a lot of things in a career of 40
40 years, and that's how I -- my first professional
41 job was as a tribal biologist, where,
42 incidentally, the fish were being harmed from our
43 biology, that we were being -- we had a net pen
44 program to release coho salmon and one year they
45 all died, and that's another impetus to my present
46 career.
- 47 But, yeah, it takes a lot of patience and

1 that's one of the reasons I'm not up in British
2 Columbia advocating, lobbying, we've produced the
3 paper and I'm busy elsewhere, and if people want
4 to follow up, that's great. But I don't lay awake
5 at night worrying about whether or not DFO is
6 going to adopt this. It's really the society's
7 decision up here.

8 MS. GAERTNER: Thank you, those are my questions, Mr
9 Commissioner.

10 MS. BAKER: Mr. Commissioner, those are all the
11 questions for Dr. Rensel. I have nothing to re-
12 examine on.

13

14 QUESTIONS BY THE COMMISSIONER:

15

16 Q Dr. Rensel, you may have addressed it in your
17 paper, or you may have addressed it this morning
18 in an answer. I am just trying to get an
19 understanding. Is there any, you've talked about
20 far off research in Asia and you've just returned
21 from an interesting part of the world. But right
22 here at home, is there any sharing between
23 governments that you're aware of, that is
24 Washington State, or federal, U.S. and Canada,
25 around your specific area of research. In other
26 words, are you aware of any programs where the
27 governments have come together, not to look at far
28 off places, but to look in their own waters off
29 the West Coast of Canada and the United States
30 regarding your specific area of research?

31 A Well, there certainly is for a number of fishery
32 fields, the salmon management, herring management,
33 I know friends of mine are involved on both sides
34 of the border. It's very common there's cross-
35 border work going on, but as I indicated, I don't
36 think presently, although DFO has expert
37 phytoplankton ecologists, there's no one
38 identified as the harmful algal bloom specialist,
39 and I don't see people at the national or
40 international meetings from British Columbia, so
41 that's what I'm seeing.

42 THE COMMISSIONER: Thank you very much.

43 MS. BAKER: Thank you, Mr. Commissioner, I was hoping
44 to actually start the other panel before the lunch
45 break, and I could either ask them to come up and
46 get their introductions done, or maybe we could
47 back five minutes early after, at five to 2:00?

53
PANEL NO. 53
In chief by Ms. Baker

1 THE COMMISSIONER: Sure, why don't we do that.
2 MS. BAKER: Do that? Okay. Thank you.
3 THE COMMISSIONER: Okay.
4 THE REGISTRAR: The hearing is now adjourned until five
5 to 2:00.

6
7 (PROCEEDINGS ADJOURNED FOR NOON RECESS)
8 (PROCEEDINGS RECONVENED)
9

10 THE REGISTRAR: The hearing is now resumed.
11 MS. BAKER: Thank you. Mr. Commissioner, we have a
12 panel of three, one by way of video conferencing,
13 that's Mr. Sergio Di Franco, in Ottawa. And in
14 the room with us today, we have Peter Ross, who
15 you'll remember, and Bruce Reid. So they'll be
16 affirmed now.

17 THE REGISTRAR: Yes, Mr. Di Franco, do you hear me?

18 MR. DI FRANCO: Yes, I can.

19
20 SERGIO DI FRANCO, affirmed.
21

22 THE REGISTRAR: Would you state your name, please?

23 MR. DI FRANCO: Sergio Di Franco.

24 THE REGISTRAR: Thank you. Yes, and your affirmation
25 is still in effect.

26 DR. ROSS: Yes.
27

28 BRUCE REID, affirmed.
29

30 THE REGISTRAR: Would you state your name, please?

31 MR. REID: Bruce Reid.

32 THE REGISTRAR: All right. Could I ask you to give
33 your name again?

34 DR. ROSS: My name is Peter Ross.
35

36 PETER ROSS, recalled.
37

38 THE REGISTRAR: Great, thank you. Counsel?

39 MS. BAKER: Thank you. Just a reminder to turn the
40 mike on when you speak.

41 THE REGISTRAR: Oh, sorry.

42 MS. BAKER: I don't know if the recorder caught that,
43 or not. All right. Thank you.
44

45 EXAMINATION IN CHIEF BY MS. BAKER:

46
47 Q I'll begin with you, Mr. Di Franco, to just

August 17, 2011

54
PANEL NO. 53
In chief by Ms. Baker

1 identify your CV for the record. So that's in
2 Tab 1 of the Commission's documents.

3 MR. DI FRANCO: Yes.

4 Q Okay. So you have that there before you and that
5 is your CV and that identifies you as being the
6 senior enforcement and prevention officer with DFO
7 in the Canadian Coast Guard Environmental Response
8 Unit?

9 MR. DI FRANCO: That's correct.

10 MS. BAKER: Okay. Thank you. I'll have that marked,
11 please.

12 THE REGISTRAR: It will be marked as Exhibit 1372.

13 MS. BAKER: Thank you.

14

15 EXHIBIT 1372: *Curriculum vitae* of Sergio Di
16 Franco

17

18 MS. BAKER:

19 Q And Dr. Peter Ross, you've already been a witness
20 before the Commission and your CV is already
21 marked as an exhibit, but just for the record,
22 it's Exhibit 1043. And then Mr. Reid, if I can
23 ask you to just identify your CV, which is at
24 Tab 31 of the Commission's documents. Is that
25 your CV?

26 MR. REID: Yes, that is.

27 Q Okay. And you are currently the regional manager
28 -- it says on your CV, you're the Regional
29 Manager, Oceans Programs, Oceans, Habitat and
30 Enhancement, but I understand that's now called
31 the Ecosystems Management Branch?

32 MR. REID: That is correct.

33 Q Okay. Thank you. And prior to that, from 2007 to
34 2009, you were the Regional Manager of Habitat
35 Protection and Sustainable Development within the
36 then OHEB branch?

37 MR. REID: That's correct.

38 MS. BAKER: Okay. And could that be marked, please?

39 THE REGISTRAR: That will be exhibit number 1373.

40 MS. BAKER: Thank you.

41

42 EXHIBIT 1373: *Curriculum vitae* of Bruce Reid

43

44 MS. BAKER:

45 Q All right. Now, I'll move to some questions for
46 Mr. Di Franco. Mr. Di Franco, you're here as a
47 representative of the Canadian Coast Guard,

1 primarily talking about marine spills. Can you
2 hear me all right?

3 MR. DI FRANCO: Yeah, I'm having a little bit of
4 trouble. I've asked, I guess it's John Lunn, to
5 work on the audio a bit.

6 MS. BAKER: Okay. Just let me know if you can't hear
7 me.

8 MR. DI FRANCO: That's a bit better.

9 MS. BAKER: Yeah, we can hear you fine so as long as
10 you can make out what I'm saying, we should be
11 able to hear you okay.

12 Q Can you describe the Canadian Coast Guard's role
13 in marine pollution incidents?

14 MR. DI FRANCO: Certainly. The Canadian Coast Guard is
15 the lead federal agency responsible for ship
16 source and mystery source pollution incidents in
17 Canadian waters. Canadian waters being all the
18 waters out to the exclusive economic zone, so it's
19 a 200-nautical-mile limit, but also internal
20 waters, including lakes and rivers. The key point
21 is the ship source and mystery source pollution
22 incidents.

23 So as a lead federal agency, we get our
24 mandate, our legislative mandate mainly from two
25 Acts of Parliament, the first is the **Canada**
26 **Shipping Act**, which is Part 8, Section 180,
27 specifically, and the other Act is the **Oceans Act**,
28 which our role is referred to in s. 41. So as the
29 lead federal agency, we fulfil two main roles in
30 marine pollution response. The first role is if a
31 polluter is known, willing and able to respond to
32 a marine pollution incident, then we will, the
33 Coast Guard will let the polluter respond to the
34 marine pollution incident once we are satisfied
35 with the polluter's intentions and response plans.
36 However, if a polluter is unknown, or if a
37 polluter is unwilling or unable to respond, then
38 the Coast Guard will manage the response and
39 ensure an appropriate response to the incident,
40 bearing in mind that the polluter always pays for
41 the cost of the response, as well as pollution
42 damage.

43 Q When you were describing the two types of marine
44 spills that you were responsible for with Coast
45 Guard, you said one was ship source, and then the
46 other, I just wanted to make sure we got the
47 record clear, was it mystery spills, or industry

1 source?

2 MR. DI FRANCO: Mystery source.

3 Q Mystery.

4 MR. DI FRANCO: We assume responsibility for mystery
5 source spills because we assume the spill came
6 from a ship somewhere, unless it's verified after
7 that it's land based. And in terms of land-based
8 spills, the Canadian Coast Guard has no lead
9 agency authority for land-based spills. Land-
10 based spills are the responsibility of the
11 province, or if it comes from a federal facility,
12 it would be Environment Canada that would manage
13 the response to that. So in terms of mystery
14 spills, we assume it's ship source and we take
15 care of those, until it's determined that it's a
16 land-based source. And it could be industry, or
17 it could be sewer outfall, or whatever, but in
18 terms of mystery spills, we assume it's ship
19 source, until proven otherwise.

20 Q Okay. Is evaluation of habitat impacts from
21 marine pollution part of the Coast Guard's
22 mandate?

23 MR. DI FRANCO: Well, what the Coast Guard does is when
24 a report of a marine pollution incident is
25 reported to the Canadian Coast Guard, the first
26 thing that the duty officer will do is conduct a
27 visual assessment of the incident. So they get
28 the call, they go out, do the assessment, and the
29 initial assessments are always done by Coast Guard
30 so if they see a beach, or an agriculture site, or
31 shoreline, or any other habitat is being impacted
32 by oil, then yes, that's the first bit of
33 assessment that's done by the Canadian Coast
34 Guard. And if further assessment is required,
35 then the appropriate agencies are brought in to
36 conduct further assessments.

37 Q And which agencies would be responsible for
38 addressing short or long-term habitat impacts?

39 MR. DI FRANCO: The agencies within the Regional
40 Environmental Emergencies Team, the REET will
41 decide which agencies are appropriate to determine
42 long-term, or short and long-term habitat impacts.

43 Q Okay. Maybe just picking up on that, you can
44 explain what the REET is. It's described as the
45 Regional Environmental Emergency Team, and what is
46 that?

47 MR. DI FRANCO: Yeah. The REET is a body of advisors,

1 a body of experts that provide technical,
2 scientific and environmental advice to the
3 Canadian Coast Guard as a lead agency. The REET
4 was initially formed in 1973 from a cabinet
5 decision, and their main role is to provide, as I
6 said, the scientific, environmental and technical
7 advice to the Canadian Coast Guard.

8 The REET is chaired by Environment Canada.
9 They're the lead of REET and in some regions in
10 Canada, the province will co-chair with
11 Environment Canada. And in British Columbia, I
12 believe that is the case.

13 So the type of information that the REET will
14 provide the Canadian Coast Guard can include all
15 types of information. They'll provide information
16 such as weather and marine forecasts, sampling
17 analysis, shoreline clean-up assessment, work,
18 still trajectory modelling, disposal, information
19 regarding disposal. We will go to REET to ask for
20 approval regarding alternate response strategies,
21 which can include using chemical dispersants or *in*
22 *situ* burning. They will conduct wildlife
23 monitoring, as well as habitat and fisheries
24 monitoring or analysis where it's needed.

25 The REET is just one -- you can view the REET
26 as one-stop shopping for all of this technical,
27 and scientific, and environmental advice. They
28 are just one component of the response pie, so to
29 speak that the Coast Guard takes into
30 consideration before deciding what type of
31 response action needs to be implemented.

32 Q All right. And just to clear up something, in the
33 PPR document that has been marked now in these
34 proceedings, and identified in paragraph 60, that
35 the provincial emergency program was the co-chair
36 of REET with Environment Canada; is that correct?
37 Is it the B.C. Provincial --

38 MR. DI FRANCO: Sorry, can you repeat again?

39 Q Is it the provincial emergency program that co-
40 chairs the REET with Environment Canada, or is it
41 the Province's Ministry of Environment, generally?

42 MR. DI FRANCO: In B.C., it's my understanding that
43 it's the Ministry of Environment, in B.C. --

44 Q And not the --

45 MR. DI FRANCO: -- that co-chairs with Environment
46 Canada.

47 Q Not the provincial emergency program?

1 MR. DI FRANCO: I don't believe so. You would have to
2 ask the Province to clarify that.

3 Q Okay. Are REETs always convened if there is a
4 marine pollution incident?

5 MR. DI FRANCO: No, they're not always convened. It
6 certainly depends on the type of incident that
7 we're dealing with, and the circumstances
8 surrounding the incident.

9 Q Okay. How does the Coast Guard determine whether
10 or not a REET will be in place to respond to a
11 marine pollution incident?

12 MR. DI FRANCO: Well, really, there's two ways in which
13 REET could be activated. Environment Canada is
14 included in the callout list that marine pollution
15 incidents get reported to. So a report will come
16 in, and in B.C., I believe it's the Regional
17 Marine Information Centre, the RMIC. They will
18 fan out the marine pollution incident to various
19 agencies, one of them is Transport Canada, Marine
20 Safety. The other one is Canadian Coast Guard,
21 the duty officer that's on call. The third one is
22 Environment Canada, and the fourth one is the
23 Province of B.C. So those incidents get reported
24 to those agencies. So the Coast Guard, upon
25 receiving a call, will do an assessment of the
26 marine pollution incident, and upon that
27 assessment, if further action is required,
28 information is required, they will call upon the
29 REET, they will call Environment Canada to
30 activate the REET and then at that point,
31 Environment Canada will convene a meeting and
32 start dealing with the issues with the problems at
33 hand.

34 The other way is that REET can self-activate,
35 if you will, in that as since Environment Canada
36 gets the same report that the Canadian Coast Guard
37 does, they can activate themselves if they feel
38 it's necessary to deal with a certain incident.

39 Q All right. So that would be a decision by
40 Environment Canada and the Province to, what you
41 called, self-activate a REET?

42 MR. DI FRANCO: Yes.

43 Q Okay. Does the Coast Guard, when making a
44 decision as to whether a REET is necessary, talk
45 to the Department of Fisheries and Oceans, and I
46 recognize that Coast Guard is part of DFO, but the
47 non-Coast Guard part of DFO, is there a

1 conversation between the two sides of DFO in
2 assessing whether or not a REET is required in a
3 marine spill?

4 MR. DI FRANCO: Generally, no. The Canadian Coast
5 Guard will talk with the chair of REET and the co-
6 chair. So it will be Environment Canada and the
7 Province in B.C.'s case. The chair or co-chair
8 will decide, normally, if DFO Habitat and Science
9 is required.

10 Q All right. And can you give me an example of when
11 you would not have a REET?

12 MR. DI FRANCO: Well, in the majority of cases that
13 Canadian Coast Guard deals with, which are, you
14 know, normally, small discharges of oil, in the
15 majority of those cases, the REET is not called
16 upon simply because the spills are small,
17 dispersed quickly, or there are no major resources
18 at risk or impacts that are noted. So for
19 example, the Coast Guard gets a lot of calls
20 regarding spills in harbours, or ports, or
21 derelict vessels that are, you know, slowly
22 leaking oil, and whatnot, but that aren't causing
23 much damage, or where the oil is not spreading
24 significantly. The REET normally isn't called for
25 those types of incidents. That's not to say that
26 they wouldn't be, depending on where the incident
27 is occurring and what sort of resources are at
28 risk, but generally, those types of incidents
29 don't include the REET.

30 Q To the next question, I'll start with you, Mr.
31 Di Franco, but then I'd like to just ask the Panel
32 if they have anything to add to whatever your
33 answers are. So the first question is in relation
34 to marine pollution incidents, is there a
35 mandatory role for DFO Science on a REET?

36 MR. DI FRANCO: I'm answering first?

37 Q Yeah.

38 MR. DI FRANCO: Okay. No, generally, there is no
39 mandatory role for DFO Science to be on the REET.
40 That decision is made by the chair of REET. And
41 again, it depends on the issues that are being
42 dealt with in the incident. If there's a specific
43 issue where the chair feels that DFO Science
44 should be called upon, then they will do that.

45 Q Okay. Thank you.

46 MR. DI FRANCO: But generally, no, they're not
47 mandatory. The way the REET works, not only in

1 Pacific, but in all other regions in Canada, is as
2 the incident, the response to an incident
3 progresses or escalates and the issues become more
4 and more prominent, then the REET will escalate
5 and will bring on advisors from other agencies
6 when required and as appropriate. They will not
7 call them automatically.

8 Q Okay. And then I'd just like to open it to the
9 Panel, then, starting with you, Dr. Ross, do you
10 have any comment to add to that?

11 DR. ROSS: Well, not being privy to, I guess, the
12 structure of the REET and its obligations and
13 organizational structure, I can't really comment
14 on that. I can say that I was invited to serve on
15 two REETs that I recall out of a number of major
16 incidents. That was the Robson Bight incident and
17 the Westisle, the *MV Westisle* sinking.

18 Q And Mr. Reid?

19 MR. REID: My understanding is similar to Mr. Di
20 Franco, in that DFO doesn't have a mandatory role
21 on REET. They are invited to participate when as
22 needed, or as required.

23 Q And then the next question, back to you, Mr. Di
24 Franco, what about DFO Habitat staff? Is there a
25 mandatory role for DFO Habitat staff on the REET?

26 MR. DI FRANCO: It's the same reply as DFO Science.
27 They are called upon as required, as the issues
28 dictate.

29 Q Okay. And anything to add, either Dr. Ross, or
30 Mr. Reid?

31 DR. ROSS: Well, my understanding in the past has been
32 that our Habitat staff, particularly Water Quality
33 Unit had key expertise in terms of understanding
34 the nature of point source spills and impacts on
35 fish and fish habitat. And those same staff, it
36 was a small group, but those same staff members,
37 would confer with experts within the Science realm
38 at DFO, including myself and/or others. So
39 certainly, in the past, there was good
40 communication between Science and Habitat. Our
41 advice was solicited on a regular basis.
42 Sometimes, you know, on these urgent matters or
43 emergencies, but certainly that has tapered off of
44 late, in part because those staff members no
45 longer have a role, the Water Quality Unit has
46 been disbanded, and we no longer have
47 conversations on these matters.

1 Q Thank you. And Mr. Reid, anything to add?

2 MR. REID: Just that in terms of does the Habitat part
3 of DFO have a mandatory role? It's not mandatory
4 and the Habitat Program staff are brought into the
5 REET process when requested. Just a bit of a
6 comment on Mr. Ross's, he's correct, in the past,
7 there was a dialogue between the two, Habitat and
8 Science, and so there has been, you know, a change
9 over time.

10 Q Okay. Going back to the Panel again, I'll start
11 with you again, Mr. Di Franco, and then open it to
12 the other two. In a REET, which agency is
13 responsible to advise on impacts on anadromous
14 fish and fish habitat in the marine environment?

15 MR. DI FRANCO: Again, that would be the chair of REET
16 who would determine the agency that should be
17 brought in to determine those impacts.

18 Q Okay.

19 MR. DI FRANCO: So Environment Canada.

20 Q And Dr. Ross?

21 DR. ROSS: Well, based on my experience, that may be
22 the case, but I would, I guess, like to remind
23 people that the REET is a voluntary organization,
24 it's multi-agency, and it provides advice. In my
25 experience, that advice has been ignored. And so
26 it strikes me that if we're providing expert
27 advice, as scientists, as to natural resources
28 that are important to our agencies, such as
29 anadromous fish or marine mammals, it would be
30 nice to know that there was a formalized role for
31 the provision of that advice and, I guess,
32 credence paid to the nature of that advice and
33 what can be done to mitigate.

34 Q And Mr. Reid, you've been involved in REETs in
35 your role as a DFO Habitat representative. Can
36 you add any content here as to which agency is
37 responsible for advising on impacts to anadromous
38 fish and fish habitat in a marine environment?

39 MR. REID: My perspective is that the chair of REET,
40 normally Environment Canada, would seek advice
41 from Fisheries and Oceans Canada on impacts
42 related to anadromous fish and fish habitat. And
43 normally, DFO would be providing advice
44 specifically around the impacts on fish habitat
45 currently, and that would be advice given to the
46 REET as required. It could be issues around the
47 shoreline, it could be issues where fish are

1 present, and where fisheries are taking place.
2 And so it's a range of advice that we provide to
3 the REET.

4 Q But do you agree with Dr. Ross that there is no
5 formal requirement for Environment Canada to seek
6 that advice, that it may happen, but it also may
7 not happen?

8 MR. REID: It's not mandatory for Environment Canada to
9 seek that advice, but normally, they would do
10 that.

11 Q And then in terms of monitoring and sampling in
12 relation to spills in the marine environment and
13 how those spills may affect anadromous fish and
14 fish habitat, I'll just start with you, Dr. Ross,
15 is it important to monitor and to sample the
16 environment after a marine spill?

17 DR. ROSS: Well, again, I guess, as a scientist and
18 observer on a number of incidents, I like to
19 understand what's going on in the environment and
20 obviously, that starts with understanding the
21 nature of the liquid that has been spilled. It's
22 not always diesel, it's not always a light fuel
23 that's going to dissipate. It might be a crude
24 oil with thousands of hydrocarbon constituents, it
25 might be a toxic chemical that is acutely lethal
26 or chronically problematic for organisms. So from
27 my perspective, when we look at a spill, there's
28 no single formula for what happens in the event of
29 a spill. There are hundreds, if not thousands of
30 permutations and possibilities and I think it's
31 important to have scientists, experts in the field
32 that are engaged, that are informed, that are kept
33 in the loop, that can provide advice, that can
34 perhaps recommend sampling, monitoring, and help
35 to guide the efforts with regard to mitigation or
36 cleanup or the protection of natural resources,
37 including traditional foods for local First
38 Nations. And I guess that's where I see a role
39 for Science. It's important to understand where
40 these pollutants go in the environment, how they
41 behave, in what type of fish, and invertebrates,
42 and marine mammals or seabirds they might end up,
43 the harm they might do, and a lot of that, in my
44 view, would require the engagement of scientific
45 research and/or monitoring.

46 I might also add that in the past, we, as
47 scientists, have provided guidance to that effect,

- 1 to collect samples in support of prosecutions
2 pursuant to s. 36 of the **Fisheries Act**. And if we
3 aren't collecting samples under the guidance of
4 scientific researchers who are expert in the
5 collection of these samples, and the selection of
6 those samples, and the design of those follow-up
7 studies, then I fear that we are incapacitated, I
8 guess, as those who might apply the letter of the
9 law and pursue the responsible party, or the
10 polluter who is supposed to pay at the end of the
11 day.
- 12 Q Thank you. Mr. Di Franco, I understand that any
13 samples or monitoring plans that are required in
14 relation to a spill in the marine environment are
15 specified in a monitoring plan; is that right?
- 16 MR. DI FRANCO: Sorry, can you repeat one more time?
- 17 Q Yeah. Where there is a marine spill and
18 collection of samples or monitoring is required,
19 that's specified in a monitoring plan for that
20 spill?
- 21 MR. DI FRANCO: Yes. Yes, it is.
- 22 Q And who develops the pollution monitoring plan in
23 response?
- 24 MR. DI FRANCO: That depends. If a polluter is willing
25 and able to do the response, then they will be the
26 ones who will develop a monitoring plan, and that
27 monitoring plan is given to Coast Guard and the
28 REET to review and for Coast Guard and REET to
29 comment on. And if any changes or amendments to
30 the monitoring plan are required, then the Coast
31 Guard will ensure that the polluter makes those
32 amendments. If it's a mystery spill, or if the
33 polluter is unable and unwilling to respond and
34 produce a monitoring plan, then it's REET's
35 responsibility to get that monitoring plan
36 completed within its own organization.
- 37 Q You said that the monitoring plan would be given
38 to Coast Guard and to the REET to review. Would
39 REET advise the Coast Guard as to whether the
40 monitoring plan was sufficient, or not?
- 41 MR. DI FRANCO: Absolutely.
- 42 Q And is the Coast Guard required to follow the
43 advice provided by REET?
- 44 MR. DI FRANCO: No, the Coast Guard does not have to
45 follow the advice of REET. It depends on a
46 variety of factors and the circumstances
47 surrounding the situation. Generally, the Coast

1 Guard does accept REET's advice, but the
2 information that is provided by REET is just one
3 component of the overall response plan, I guess
4 you can say.

5 Q And if Science was involved in providing advice on
6 a monitoring plan, that advice from Science would
7 come through the REET; is that right?

8 MR. DI FRANCO: Yes, through the chair.

9 Q Okay. So what kinds of considerations would the
10 Coast Guard have in making adjustments to a
11 monitoring plan that has been recommended by the
12 REET?

13 MR. DI FRANCO: Well, there could be a number of
14 considerations that the Coast Guard would
15 consider. I'll give you some examples. There's
16 worker safety issues, public safety issues, the
17 nature of the product spilled, weather conditions,
18 or forecast conditions, tide information, cost and
19 reasonableness of the effort or the monitoring
20 could also come into play. Those are the other
21 bits of information that the Coast Guard has to
22 consider before, you know, including the advice
23 from REET, those are all the things that the Coast
24 Guard needs to consider to determine the
25 appropriate steps that need to be taken.

26 Q And the comment that reasonableness would be
27 considered and whether the cost is reasonable, how
28 is that assessed? Who makes the determination as
29 to what is reasonable and what are the factors in
30 understanding reasonableness?

31 MR. DI FRANCO: Reasonableness is a little bit
32 difficult to explain. Basically, any action that
33 is taken by either the polluter or ourselves has
34 to be reasonable. It has to basically pass the
35 test of reasonableness. The fact that we are in a
36 regime where the polluter pays, we adopt a
37 polluter pay principle, meaning the polluter must
38 pay for all monitoring, any monitoring costs
39 incurred by the government, or any responsive
40 costs incurred by the government, the actions have
41 to be reasonable in that we cannot implement any
42 action or response action that is too costly and
43 above and beyond what a reasonable person would
44 implement. For every action that we take in a
45 marine pollution incident, we always try to
46 recover our costs, and that's done through either
47 the polluter, their insurance company, or if not

1 the polluter, then we go through the Ship Source
2 Oil Pollution Fund. And when we submit our claim
3 to the polluter, to the insurance company or the
4 Fund, we have to demonstrate reasonableness in our
5 actions. If any actions are deemed unreasonable,
6 then the Coast Guard will not recover its
7 monitoring or response costs. So reasonableness,
8 again, basically means that anything that is
9 implemented has to be -- that you have to conduct
10 a cost benefit analysis, so to speak, to help
11 determine if an action is reasonable.

12 There isn't one clear definition for
13 reasonable. We've asked our legal department to
14 help us to do that and come back with some
15 suggestions, but basically, any reasonable action,
16 any action is considered reasonable if another
17 reasonable person would implement a similar or
18 same action. That's probably the best definition
19 I can come up with right now.

20 Q All right. And who on the Coast Guard, like, what
21 level, I guess, of position within Coast Guard
22 makes that assessment of reasonableness? Is it
23 one person, is it a group of people?

24 MR. DI FRANCO: I mean, it normally rests with the on-
25 scene commander or federal monitoring officer.
26 It's, I guess, the Coast Guard representative on
27 site, who's in charge of the incident. We call
28 that person on-scene commander or federal
29 monitoring officer, depending on the posture that
30 the Coast Guard has taken. They would normally
31 take that decision, however, if that person needs
32 to consult with other members within the Coast
33 Guard, then, you know, they are certainly free to
34 do that, and they have done that in the past.

35 Q And what kind of qualifications would the on-scene
36 commander have? Would they be scientists,
37 biologists, what would they be?

38 MR. DI FRANCO: Those qualifications are -- actually,
39 we have an on-scene commander and federal
40 monitoring officer directive, which are in the
41 documents, in the documents here, and those
42 directives list the experience and qualifications
43 that are required to conduct those functions.

44 Q All right. Could I ask you just to look at
45 Canada's document number 53 and just tell me if
46 that's what you're referring to?

47 MR. DI FRANCO: Yeah. Just give me a minute, here.

66
PANEL NO. 53
In chief by Ms. Baker

1 Q Oh, sorry, maybe look at 52 and 53.

2 MR. DI FRANCO: Yes, that's correct, 52 directive,
3 3030-2002-01 and 3040-2002-02, if you refer to
4 those documents, there is a list of guidelines,
5 criteria for conducting the function of the
6 federal monitoring officer or on-scene commander.

7 Q Okay.

8 MS. BAKER: Why don't we have those pulled up and
9 marked as exhibits, then. So we'll start with
10 Canada's document 52.

11 THE REGISTRAR: It will be marked as exhibit number
12 1374.

13

14 EXHIBIT 1374: Fisheries and Oceans Canada,
15 Canadian Coast Guard, Directive D-3030-2002-
16 01 re Federal Monitoring Officer

17

18 MS. BAKER: And the next one would be Canada's document
19 53.

20 THE REGISTRAR: 1375.

21

22 EXHIBIT 1375: Fisheries and Oceans Canada,
23 Canadian Coast Guard, Directive D-3040-2002-
24 02 re On-Scene Commander

25

26 MS. BAKER:

27 Q So if we go to Exhibit number 1375, does that help
28 us to understand the qualifications of the person
29 who's making that reasonableness decision?

30 MR. DI FRANCO: Yes, and, of course, the federal
31 monitoring and on-scene commander is an individual
32 within the Coast Guard that has also conducted the
33 required training and, you know, years of service,
34 or whatnot. The Environment Response Program has
35 a training program for our responders which starts
36 off with basic level training and goes up all the
37 way to on-scene commander training. So those
38 individuals who receive all the training and have
39 had enough years of experience, I guess, would
40 fulfil these functions.

41 Q All right. So if we turn to, in that document
42 I've just identified, Exhibit 1375, s. 3.2
43 "Guidelines to assist in the selection of an
44 appropriate on-scene commander," that is the list
45 that would explain the qualities in an on-scene
46 commander; is that right?

47 MR. DI FRANCO: Oh, sorry, I'm in -- 3.2?

1 Q Yeah.

2 MR. DI FRANCO: Page 5, yes.

3 Q All right. And if you'd turn the page to page 6,
4 one of the items is "the ability to identify the
5 public's interests and priorities." And how is
6 that determined?

7 MR. DI FRANCO: "Ability to identification the public's
8 interests and priorities." Well, I mean,
9 identifying public's interests and priorities is
10 mainly conducted through the liaison function, the
11 liaison officer within our Response Management
12 System. That person is responsible for talking
13 and engaging with the public and determining what
14 their priorities, interests and concerns are, and
15 then that information is passed on to the on-scene
16 commander.

17 Q Is there ever an involvement higher up, say, to an
18 ADM level, or that sort of level to where there is
19 perhaps some uncertainty about whether a cost
20 should be incurred, or not? Does it go further up
21 the chain to get some guidance from an ADM, or
22 regional director, or even a minister?

23 MR. DI FRANCO: It could, yes, depending on the
24 incident and the circumstances surrounding an
25 incident, it could.

26 Q All right. And in making decisions on the REET,
27 would the Coast Guard also take into account
28 information sheets or standards from international
29 organizations, for example, from NOAA, in the
30 U.S., or any other similar organizations?

31 MR. DI FRANCO: Yes, it could.

32 Q Okay. And if the Coast Guard had science advice
33 directly relevant to a spill from the scientists
34 within DFO, would that direct science advice take
35 precedent over international fact sheets or
36 information that we've just talked about?

37 MR. DI FRANCO: I can't say for certain. It would
38 depend on the situation, the incident and the
39 circumstances surrounding the incident.

40 Q Okay.

41 MR. DI FRANCO: It may or may not.

42 Q And in terms of a proposal to remediate a site, if
43 that was put forward by a polluter and the
44 polluter had a different -- and perhaps they've
45 engaged a cleanup company to do that work for
46 them, if that company or polluter had a different
47 view of how the site should be cleaned up, or what

- 1 monitoring should be done in relation to the site,
2 if that polluter information differed from DFO
3 Science or REET's advice, would Coast Guard prefer
4 the advice from their scientists and REET?
- 5 MR. DI FRANCO: Again, it depends on the circumstances
6 surrounding the incident, it may or may not.
- 7 Q Okay. In terms of these monitoring plans, who
8 actually enforces them? Who makes sure that they
9 are followed and done properly?
- 10 MR. DI FRANCO: Well, the monitoring plan is part of
11 the overall response plan so that responsibility
12 falls to the lead agency, so it would be, for ship
13 source or mystery source spills, that would be the
14 Coast Guard.
- 15 Q Okay. And it would be Coast Guard's
16 responsibility, then, to assess the monitoring and
17 ensure that it was done correctly?
- 18 MR. DI FRANCO: They would be responsible for ensuring
19 the monitoring plan is implemented as described.
- 20 Q Okay. And where do the actual results from the
21 monitoring go? Who receives those results and
22 assesses them?
- 23 MR. DI FRANCO: Those results go to the lead agency, so
24 the Canadian Coast Guard, as well as all members
25 of the REET.
- 26 Q And is it done as a kind of a reporting at the end
27 of the project, or how does that happen?
- 28 MR. DI FRANCO: Well, those types of details are
29 specified in the monitoring plan. Each monitoring
30 plan, obviously, will be different, and the
31 monitoring plan will specify exactly when, where,
32 how and who will get the results so it's all done
33 within the monitoring plan.
- 34 Q And if the results of the monitoring show that
35 there's an ongoing problem in the environment,
36 what would be the outcome?
- 37 MR. DI FRANCO: Well, if there was an ongoing problem
38 that was noted, the Coast Guard, as lead agency,
39 would have to re-engage the polluter to amend the
40 situation and amend the monitoring plan, or do
41 whatever the Coast Guard feels is necessary to
42 remediate the situation, and that would be done in
43 conjunction with REET.
- 44 Q Okay. All right. So in terms of receiving advice
45 on anadromous fish and fish habitat, the Coast
46 Guard relies on the REET or the lead agency to
47 coordinate that advice, that's right?

1 MR. DI FRANCO: Yes, the Coast Guard would rely on the
2 REET, yes.

3 Q All right. And would be through the lead agency,
4 which is Environment Canada for the federal
5 government; is that right?

6 MR. DI FRANCO: Well, we'd call Environment Canada
7 chair, the chair of REET so --

8 Q Sorry.

9 MR. DI FRANCO: -- it would be through them.

10 Q All right. Dr. Ross, are you satisfied that
11 Environment Canada has sufficient expertise to
12 advise on anadromous fish and fish habitat in the
13 marine environment, including on monitoring and
14 sampling programs?

15 DR. ROSS: Well, traditionally, DFO conducted the
16 overwhelming amount of research related to
17 environmental contaminants in the marine
18 environment, and DFO also has the position or the
19 opportunity to engage in sampling aboard a number
20 of small, medium and large-sized research vessels.
21 DFO also has a notable collection of experts in a
22 wide variety of disciplines related to the natural
23 resources for which we are custodians and
24 managers. So I certainly see that DFO has a
25 tremendous amount of expertise on the resources
26 that are out at sea, and I also know from personal
27 and professional experience that DFO has
28 traditionally had a number, not a large number,
29 but a number of contaminant experts. These are
30 people who understand the nature of the many tens
31 of thousands of chemicals out in the world and in
32 the marine environment. I'm a toxicologist. That
33 means I'm concerned about the adverse health
34 effects of some of these chemicals on biota,
35 including marine mammals, and fish, and other
36 creates.

37 In looking at Environment Canada, I have
38 excellent colleagues, both in the freshwater
39 environment and in the marine environment, but
40 most of them would be working on either non-
41 migratory resident species of fish, even Great
42 Lakes or in other freshwater ecosystems,
43 landlocked, or sea birds, some excellent long-term
44 spatial and temporal monitoring using herring
45 gulls in the Great Lakes, double-crested
46 cormorants, great blue herons out here in British
47 Columbia, osprey, and these research projects and

1 monitoring programs have shed tremendous insight
2 into a lot of chemicals of concern.

3 If I look at anadromous fish and marine
4 mammals, first of all, back to the natural
5 resources, the biology, ecology and habitat use of
6 these sorts of species, simply put, they remain
7 the purview of the Department of Fisheries and
8 Oceans. To extricate contaminants or pollutants
9 from those marine mammals and fish and expect our
10 colleagues at Environment Canada to have the
11 intellectual, technological and logistical
12 capacity to understand what these types of
13 contaminants might do to anadromous fish and/or
14 marine mammals, is a tall order, I would say, and
15 it is not happening.

16 Q In your view, is the Coast Guard the appropriate
17 agency to determining monitoring and mitigation
18 plans designed to evaluate the short and the long-
19 term impacts on habitat and anadromous fish?

20 DR. ROSS: Well, I note for the on-scene commander
21 requirements, a list of 12 or 15 competencies, and
22 that's an impressive list, and certainly, Coast
23 Guard has their work cut out for them when such an
24 emergency happens. It's often in bad weather and
25 remote environments and entails pulling a lot of
26 logistical firepower into the fray. I'd have to
27 say, though, that environmental monitoring, or
28 concerns about fish and fish habitat fade to
29 background when there are questions of human
30 safety or equipment safety, as to whether it's the
31 safety of the crews involved in the incident, or
32 the crews responding to that incident. And I
33 don't wish to pass judgment on that, but I would
34 like to say that from my perspective, I remain
35 concerned that, you know, understanding the
36 impacts to natural resources and mitigating those
37 impacts requires scientific understanding and
38 would require active scientific investigation and
39 a collection of samples that would be of use
40 either in terms of understanding what's happening,
41 what the impacts are on those resources, or
42 eventually, in prosecution.

43 Q Thank you. And Mr. Reid, do you have anything to
44 add to that?

45 MR. REID: Just that I'm not really aware of what
46 expertise Environment Canada has with respect to
47 anadromous fish and fish habitat. What I can say

1 is that, certainly, Fisheries and Oceans has, in
2 Pacific Region, a considerable knowledge and
3 expertise on the biology, ecology, habitat
4 requirements of anadromous fish and fish habitat
5 and so in the event of a spill event that we could
6 encounter, anadromous fish and fish habitat, or
7 marine mammals, you know, we would expect to be --
8 certainly, our advice would be important. And
9 similarly, with respect to monitoring programs,
10 it's highly scientific, requires careful and
11 experienced knowledge in terms of what to sample
12 for, how to sample it, where to sample it, dealing
13 with very complex compounds and from a management
14 side, we very much look to our Science colleagues
15 to provide that advice.

16 Q And Mr. Di Franco, I need to ask you, as well, do
17 you think that the Coast Guard is the appropriate
18 agency, then, to determine monitoring and
19 mitigation plans to protect anadromous fish and
20 fish habitat?

21 MR. DI FRANCO: Well, the Coast Guard doesn't develop
22 those plans. This is why we engage REET, because
23 we rely on REET's expertise to either develop
24 those plans or review the polluter's monitoring
25 plans. And whatever expertise is required, you
26 know, again, depending on the nature of the
27 incident and the resources that are at risk or
28 impact, we'll call upon those appropriate agencies
29 to get that expertise. But you know, like I said
30 before, the Coast Guard does not develop those
31 plans, we do not have the expertise to develop
32 those monitor plans. We have expertise in other
33 areas, but habitat monitoring and impact
34 assessment, those types of things, we don't do
35 those things, we're not experts in that area.
36 This is why we rely on the REET to help us with
37 this area, to either develop the plans or review
38 the polluter's monitoring plans.

39 Q But you've already told us today that the Coast
40 Guard is not required to accept the advice of REET
41 and, in fact, has a series of considerations that
42 it looks at in addition to the advice received
43 from REET?

44 MR. DI FRANCO: Yes. The REET makes up one part of the
45 response operation. We look at REET as a group
46 for consolidated advice regarding a whole variety
47 of areas. And we take that advice. The

1 information we get from REET, we take that into
2 consideration and consider it with all the other
3 aspects of the response that we're dealing with at
4 the same time. There's, you know, operational
5 issues, management issues, reasonableness, legal
6 issues, public interest issues. There's a whole
7 variety of issues that the Coast Guard needs to
8 deal with in a marine pollution incident, and the
9 information that we get from REET just makes up
10 one of those bits of information to help us
11 determine which response strategy to implement and
12 what will be the most effective.

13 Q All right.

14 MR. DI FRANCO: Now, the Coast Guard values the advice
15 it gets from REET and, generally, we do accept and
16 implement their advice, but there are cases where
17 that's not always the case and there, generally,
18 are reasons for that.

19 Q All right. I mean, there certainly could be
20 incidences where Science advice proffered through
21 the REET advised for a type of monitoring plan
22 that the Coast Guard felt was not reasonable and
23 then would not implement; is that right?

24 MR. DI FRANCO: Sorry, can you say again?

25 Q If Science, through the REET, could identify a
26 type of monitoring plan, that the Coast Guard
27 would then be able to review and decide it was not
28 reasonable and then not actually implement that
29 plan; is that right?

30 MR. DI FRANCO: That could happen. That could happen.

31 Q Okay.

32 MR. DI FRANCO: It could or could not happen, yes. And
33 you know, taking into account all the other bits
34 of information that the Coast Guard is assessing
35 at the same time, that could happen, yes.

36 Q Okay. I want to move to a couple of incidents.
37 One is the Robson Bight spill in 2007, and another
38 one was in Burrard Inlet, a spill from Kinder
39 Morgan, also in 2007. So I want to start with
40 you, Dr. Ross. In 2007, there was an incident in
41 Robson Bight where a barge carrying logging
42 equipment capsized in the ecological reserve, and
43 you were brought into that REET; is that right?

44 DR. ROSS: That's correct.

45 Q And what was your role?

46 DR. ROSS: Well, I was on of the experts brought aboard
47 because I work with marine mammals and it is now a

1 critical habitat for northern resident killer
2 whales listed as threatened under the **Species at**
3 **Risk Act**. The reserve was pre-established as a
4 provincial park area. There were obviously
5 concerns about the implications of the spilled
6 liquids, including diesel to the rubbing beaches,
7 which were nearby. These are a very special
8 cultural component for the northern resident
9 killer whales. No other spot in the world do
10 killer whales come up onto a beach area and rub
11 themselves on cobble so it's considered a very
12 important part of what the habitat needs are for
13 northern resident killer whales. So I was there
14 to provide input as an expert on marine mammals,
15 but also on the nature of these pollutants and the
16 risk that they might present to killer whales in
17 particular.

18 Q And was there any party, if you recall, on that
19 REET, that was tasked with looking at risk to
20 fish, anadromous fish or fish habitat?

21 DR. ROSS: As I recall, there was a sense of
22 frustration that the REET did not have any fish or
23 fish habitat expertise, although eventually, we
24 did have a local biologist, I've forgotten his
25 name just now, who did come aboard and provide
26 some advice on important areas around the zone of
27 the spill.

28 Q And in this example, the Robson Bight spill,
29 Science advice was provided by you; is that right?

30 DR. ROSS: In part.

31 Q And was that Science advice accepted by the Coast
32 Guard?

33 DR. ROSS: We had daily conference calls so the REET
34 would have a daily briefing and conference call,
35 and that was an opportunity to get updated on the
36 conditions. It was an opportunity for the
37 different REET members to report on their
38 interpretation of risks and what was happening
39 over time. And as I recall, I was alerted to the
40 incident about 23 or 24 hours after it first
41 happened. There had been over flights, there had
42 been site visits. I believe Burrard Clean, as a
43 contract and cleanup party, was either on site or
44 almost on site. And very early on, because we
45 were unaware of the exact nature of the different
46 liquids that had spilled, I had recommended the
47 use of booms, if possible, to keep any fuels or

1 oils off the rubbing beaches, because that could
2 be injurious to killer whales. That advice was
3 followed quickly, I believe by Burrard Clean, and
4 the booms were taken down within about 36 to 48
5 hours because the fuels had primarily dissipated
6 and there were concerns expressed by others that
7 the booms might get in the way of the resident
8 killer whales as a bit of a structural obstacle.

9 We had 60 killer whales swim through the
10 diesel slick on day two, highlighting the fact
11 that our concerns were real and tangible, and that
12 events were a little bit outside of our control at
13 that point.

14 Q Okay. If I could ask you to turn to Tab 6 of the
15 Commission's documents, there's an email chain
16 there. And if you'd go to maybe the third page --
17 the second page, I should say, of that email
18 chain, there, you'll see it at the bottom, there,
19 it's from Don Rodden to Larry Wilson and Fred
20 Beach, and in this case, it says that the Coast
21 Guard had not requested the responsible party to
22 put in place a monitoring program to establish
23 baseline information on the current state of
24 hydrocarbon contaminants and sediments, biota and
25 water column, et cetera, and then it refers to a
26 NOAA fact sheet on small diesel spills. And then
27 if you could go back sort of to the beginning of
28 this email chain, there's actually an email from
29 you, Dr. Ross, to Marilyn Joyce, where you say,
30 regretfully:

31
32 The position below has completely pre-empted
33 the provision of advice from DFO Science. We
34 have several research scientists expert in
35 the area of transport and fate of
36 contaminant, including hydrocarbons ...

37
38 Et cetera, and you express some concerns with
39 reliance on the NOAA fact sheet. Can you just
40 explain what your concerns were there?

41 DR. ROSS: Yeah, I think what we're seeing here is a
42 little bit of frustration on my part and of
43 course, this was an email which is now very much
44 in the public light, but you know, the frustration
45 was a personal and professional one. I was
46 involved in this REET, and on the call, one of the
47 things that is not captured here is that on the

1 call, First Nations were very upset and very
2 concerned about diesel getting into some of their
3 local clam beds, which was happening. And I had
4 suggested, on the calls, that we collect shellfish
5 samples and, potentially, water samples, to
6 conduct hydrocarbon measurements. And we did have
7 enforcement officials, Conservation Protection had
8 a team of two on scene, they were able to collect
9 samples, but they were instructed not to, despite
10 having volunteered to do that. And I guess, you
11 know, in terms of what had happened, as I recall,
12 there were concerns expressed on a conference call
13 by Coast Guard that LeRoy Trucking Company did not
14 have the funds to carry out some of these
15 monitoring efforts.

16 Now, being sensitive to that because, as a
17 Scientist, I know how difficult it is to raise
18 money for research, and I know how expensive these
19 analyses can be, I understood where that came
20 from. At the same time, I was frustrated that as
21 a scientist, with no budget and no capacity to
22 follow my own recommendations, I was frustrated
23 that nobody else was seemingly in a position to be
24 able to fund some of these things which I
25 considered to be an important part of making sure
26 that the food supply, traditional food supply of
27 local First Nations was safe, that killer whales
28 were protected, and that we were really
29 understanding where these different types of
30 hydrocarbons were going in that local environment
31 over time.

32 Q And were you satisfied that the NOAA fact sheet
33 reflected the current state of knowledge that was
34 relevant to the spill at issue?

35 DR. ROSS: Well, I guess I was a little disappointed
36 that after a multitude of REET conference calls,
37 where we had our own local experts participating
38 and providing advice based on our, or in my case,
39 my own understanding of the scientific literature,
40 I was a little disturbed to find the Coast Guard
41 relying almost exclusively on a one-page fact
42 sheet from NOAA. I don't dispute that that is an
43 important piece of information, but it's not the
44 only piece of information that's relevant to that
45 spill incident given the fuels involved. I would
46 also point out that this decision was taken seven
47 weeks after the incident so what we're talking

1 about here is a full seven weeks after the spill,
2 at which point it was still the position of Coast
3 Guard that the 10 to 17,000 litres worth of diesel
4 had dissipated from the major source of fuel at
5 the bottom, at 350 metres depth. That we later
6 found with ROB inspection funded by our agency in
7 conjunction with NGO's was not the case. That
8 tanker truck was intact at the bottom of the
9 ocean.

10 Also, there were a number of other non-diesel
11 components. It was 17,000 litres of diesel, as I
12 recall, but almost 3,000 litres of heavy
13 lubricants, several hundred litres of hydraulic
14 oils, about 2,500 litres of gasoline so to rely on
15 a single fact sheet for diesel does not pay full
16 credence to our due justice to the somewhat more
17 complex loading on that barge.

18 Q Thank you.

19 MS. BAKER: I'd like that email chain to be marked as
20 the next exhibit, please.

21 THE REGISTRAR: Exhibit number 1376:

22
23 EXHIBIT 1376: Email chain entitled, "2007 10
24 03 Robson Bight CCG response"
25

26 MS. BAKER:

27 Q Again, Mr. Di Franco, I would like you to just --
28 I don't know if you have any knowledge about why
29 Coast Guard made the decision in the Robson Bight
30 incident to not follow the recommendations from
31 DFO Science and to rely on the NOAA fact sheet,
32 but can you help us out in understanding why that
33 decision was made?

34 MR. DI FRANCO: Well, I wasn't part of the conversation
35 at that time, nor was I part of the decision-
36 making process. Although I am familiar with the
37 incident, I did do some reporting here in Ottawa
38 on the incident. I could just give you my, you
39 know, thinking as to why the superintendent, Don
40 Rodden, did not agree with the recommendations.

41 The first thing that he notes is that the
42 initial spill did not -- the impact of the spill
43 did not -- there were no reports of impact on
44 species birds or marine mammal fatalities
45 attributed to the release. So that was the first
46 thing that I'm sure he took into consideration,
47 and the fact that there was no observable impact

1 that the diesel still had on the wildlife in the
2 area.

3 The other thing to note is that that area,
4 the area that the tanker truck sank in is an area
5 of heavy traffic where discharges are -- I don't
6 know if they're frequent, but they occur on
7 occasion. I don't know the area too well, I'm not
8 from there, but my understanding is that it's an
9 area of heavy traffic, where discharges of diesel
10 and other oils occur on occasion. And my
11 understanding is that a monitoring plan was
12 recommended to be implemented until no detectable
13 hydrocarbons were found within any media, but the
14 fact that it's a heavy traffic area and the fact
15 that discharges do occur on occasion from vessels
16 passing by, it was not reasonable for the polluter
17 to implement a monitoring program to monitor for
18 discharges of oils from the tanker truck where
19 diesels could be discharged from vessels passing
20 by that are not attributed to the polluter's
21 tanker truck. So in that sense, there, it wasn't
22 a reasonable thing for the polluter to implement
23 at that time.

24 Q But wasn't one of the recommendations that there
25 be an investigation into the tanker truck at the
26 bottom of the ocean, to see if, in fact, it was
27 empty of oil, or not, and ultimately, of course,
28 it was found that it was not emptied of oil? Was
29 that not a reasonable investigation?

30 MR. DI FRANCO: Well, Coast Guard's initial assumption
31 was that due to the amount of oil observed during
32 the onset of the incident, at that time, Coast
33 Guard -- and the fact that we were talking about
34 350 metres of depth in the ocean, it was
35 determined that, the Coast Guard determined that
36 the majority of diesel escaped during the sinking
37 of the tanker truck and that whatever amount of
38 the diesel were left on the bottom were, you know,
39 intact and would probably seep out over long, long
40 periods of time, and that any amount of seepage
41 that you would get from the tanker truck would
42 probably be undetectable.

43 Q But this was contrary to the advice that you were
44 getting from DFO Science, or that Coast Guard was
45 getting from DFO Science through the REET; is that
46 right?

47 MR. DI FRANCO: Yes, according to the email, that's the

1 information, yes, that we have here.

2 Q And you've heard now some of the concerns that Dr.
3 Ross heard, through his evidence today, and also
4 through the documents. Do you think, in
5 retrospect, that that incident was handled
6 satisfactorily by Coast Guard?

7 MR. DI FRANCO: I would say yes and no.

8 Q Okay.

9 MR. DI FRANCO: Do you want me to elaborate?

10 Q I think that might be helpful.

11 MR. DI FRANCO: Well, the initial response to the
12 incident, Coast Guard believed, I believed anyway,
13 that the response was handled adequately. There
14 was a spill of oil on the surface. The response
15 organization, Burrard Clean, was contracted. They
16 laid out some boom, they laid out some absorbent
17 pads. My understanding is that they were barely
18 able to pick anything up. The diesel was so
19 dispersed and a lot of it evaporated to the point
20 where even the absorbent pads were picking up
21 very, very little.

22 In that regard, and the fact that the tanker
23 truck sank at a depth of 350 metres, that the
24 majority of the diesel did escape at the onset of
25 the incident, and the fact that six or seven weeks
26 after the initial incident, there were no -- there
27 wasn't any reports of seepage coming from the
28 tanker truck, you know, in that respect, I think
29 the response was adequate.

30 Now, where I don't think it was adequate was
31 the tanker truck was eventually raised from the
32 bottom of the ocean against our recommendation.
33 It was a joint project by DFO and the Province. I
34 think the Province led the project, but we co-
35 funded. The tanker truck and all the remaining
36 containers of lube were raised from the bottom and
37 the tanker truck was assessed to determine how
38 much fuel was remaining in the tanker.

39 In that regard, I don't believe that that was
40 a reasonable thing to do and the Ship Source Oil
41 Pollution Fund also did not think that that was a
42 reasonable operation to conduct.

43 Q Sorry, lifting the tanker from the ocean floor was
44 not reasonable, is that what you're saying?

45 MR. DI FRANCO: Yes. Yes.

46 Q Okay. Dr. Ross, would you have had any concerns
47 if that tanker had remained on the ocean floor and

1 gradually leaked oil over the next number of
2 years?

3 DR. ROSS: Well, I guess it depends on what we value
4 and, you know, I work a lot on marine mammals and
5 we have only about 86 southern residents left, and
6 we have, probably, 200 northern resident killer
7 whales. So the resident killer whales in British
8 Columbia number fewer than 300. They're listed
9 separately under the **Species at Risk Act** at
10 endangered and threatened. We know that pollution
11 is a major concern. These are some of the most
12 contaminated marine mammals on the planet, not
13 with hydrocarbons, with persistent compounds like
14 PCBs. And I've worked a lot with stakeholders and
15 colleagues of mine that work on some of the other
16 stressors or threats to these whales and, you
17 know, when you talk to the media, you talk to the
18 public, you talk to the whale watching sector,
19 which is worth \$100 million a year to the B.C.
20 economy, when you talk to kids and elderly folks
21 and you realize just how important these killer
22 whales are to us.

23 So if we look at the spill that took place in
24 what I would consider to be the most important bay
25 for northern residents anywhere on the coast, I'd
26 have to say that I was concerned about the fact
27 that leaving all of this equipment at the bottom
28 of the ocean would present a threat over the long
29 term to **SARA**-listed northern resident killer
30 whales.

31 As it turned out, very little of the diesel
32 leaked out, most of the sheen at surface was from
33 fuel tanks of the trucks and tractors unrelated to
34 the loading of the tanker truck, and over the
35 seven weeks, between the incident and this email
36 of mine, there were descriptions of strange
37 bubbles of some kind of oil coming regularly to
38 the surface on a daily basis and nobody was quite
39 sure why that was, but we did find out after a
40 matter of a number of days, if not weeks, from
41 LeRoy Trucking that there were a number of pails
42 with these hydraulic oils, et cetera.

43 So hindsight is 20/20, but certainly, it was
44 a very sensitive part of the coast, and certainly
45 for a species of concern and for a species that
46 relies on the salmon food web.

47 MS. BAKER: Mr. Commissioner, I wanted to take Dr. Ross

1 to the Kinder Morgan in 2007, which won't be as
2 lengthy a series of questions as what we've just
3 done. I don't know if you'd like me to do that
4 now, or after the break?

5 MR. DI FRANCO: Could I say one thing --

6 MS. BAKER: Yes.

7 MR. DI FRANCO: -- regarding the Robson Bight spill?

8 The information I received regarding the tanker
9 truck once it was raised was that two-thirds of
10 the volume of the tanker truck had actually
11 released during the onset of the incident and only
12 about 3,000 litres was left in the tanker truck.
13 As the tanker truck fell, one of the top hatches
14 had opened up, allowing the diesel to escape and
15 which resulted in two of the compartments flooding
16 with water. That's why the truck didn't implode.
17 But the rear hatch, the rear top hatch of the
18 tanker truck remained intact, which resulted in
19 the diesel in that tank not escaping. So that was
20 the -- so in the end, I believe it was around
21 3,000 litres that was left in the tanker truck and
22 there was an engineering study. This is my
23 understanding, that there was an engineering study
24 conducted by UBC that looked at the tanker truck,
25 itself, and they concluded that the rate of
26 corrosion on a tanker truck, had it been left on
27 the bottom, would occur over many, many, many
28 years, and that when corrosion did start, it would
29 create little pinhole leaks, or pinholes in the
30 tanker truck and the diesel that would emanate
31 from those pinholes would be virtually
32 undetectable when it came up to the surface. I
33 just wanted to add that little bit in there.

34 MS. BAKER: Thank you.

35 THE COMMISSIONER: Thank you, Ms. Baker. I just wanted
36 to ask if I could just get a clarification. I
37 didn't find it in the PPR because my eyes were
38 going through the different paragraphs and I
39 didn't pick it up, but with respect to whom does
40 the Canadian Coast Guard answer to in terms of
41 being accountable, the words that are used in the
42 PPR are the DFO through the Canadian Coast Guard
43 does certain things. There's also Environment
44 Canada, Transport Canada, and the other agencies
45 that are involved in respect to the oceans, the
46 Pacific Ocean and the responsibilities that might
47 flow in the event of a spill. I wonder if the

1 witness could just explain which ministry is
2 directly responsible for the actions of the
3 Canadian Coast Guard? What is the reporting
4 system and just what are the allegiances with
5 respect to these different agencies.

6 MS. BAKER:

7 Q Okay. I'll see if I can summarize, and please
8 correct me if I'm wrong since it's hard for me to
9 hear. The Commissioner's asked you, looking at
10 the reporting structure for DFO and the Coast
11 Guard, who is the Coast Guard responsible to
12 report to, is that right, within the structure?
13 And he's also mentioned some of the other agencies
14 which you've referred to already, including
15 Environment Canada, Transport Canada, and he's
16 wondering how does the reporting structure work
17 through up to a minister? Is that right? Mr. Di
18 Franco, are you able to answer that?

19 MR. DI FRANCO: Yeah. Yeah, sorry. Yeah. If I can
20 clarify, reporting structure when the spill gets
21 reported to the Coast Guard, or during the
22 incident as a response to its occurring?

23 THE COMMISSIONER: Well, let's start leaving aside an
24 incident, how are these reporting structures
25 framed?

26 MS. BAKER:

27 Q He's asking leaving aside an incident, how are the
28 reporting structures framed?

29 MR. DI FRANCO: Okay. During a response to an
30 incident --

31 Q He said leaving aside an incident.

32 MR. DI FRANCO: Oh, aside from an incident, just in
33 general?

34 THE COMMISSIONER: Yes.

35 MS. BAKER:

36 Q That's right. That's right.

37 MR. DI FRANCO: Okay. Well, there's regional
38 personnel. Within the region, it starts off with
39 the Superintendent of Environmental Response.
40 That person reports to the Regional Director of
41 Maritime Safety. That person reports directly to
42 the Assistant Commissioner, and the Assistant
43 Commissioner is the highest ranking Coast Guard
44 official within the region, and then that person
45 reports to the Commissioner of the Canadian Coast
46 Guard in Ottawa.

47 THE COMMISSIONER: I'm still not sure I understand

1 which ministry has responsibility for the Canadian
2 Coast Guard.

3 MR. DI FRANCO: Sorry. Fisheries and Oceans. The
4 Canadian Coast Guard is a special operating agency
5 within the Department of Fisheries and Oceans, and
6 the Commissioner reports to the Minister of
7 Fisheries and Oceans.

8 THE COMMISSIONER: And which statute sets out the terms
9 of reference for the Canadian Coast Guard and
10 responsibilities?

11 MS. BAKER:

12 Q In addition to --

13 MR. DI FRANCO: Well, the responsibility for the
14 Canadian Coast Guard is laid out in the **Oceans**
15 **Act**, in which the **Oceans Act**, s. 41, stipulates
16 that the Minister of Fisheries and Oceans
17 delegates certain services to the Canadian Coast
18 Guard, and that includes icebreaking, search and
19 rescue, marine pollution response, MCPS and so on
20 and so on. So the main document, I guess, or the
21 overarching document is the **Oceans Act**.

22 Q And I think you identified that there's reporting
23 up to the Commissioner in Ottawa, and then is
24 there a further reporting up to the Minister, or
25 did we just mishear you when you said
26 "commissioner"?

27 MR. DI FRANCO: Yes, from the Commissioner and the
28 Commissioner will report to the Deputy Minister,
29 and then the Deputy Minister up to the Minister.

30 THE COMMISSIONER: Okay. Thank you.

31 MS. BAKER: Would you like to take the break now, then?

32 THE COMMISSIONER: Yes, that would be fine.

33 MS. BAKER: So we'll have a 10-minute break.

34 THE REGISTRAR: The hearing will now recess for 10
35 minutes.

36
37 (PROCEEDINGS ADJOURNED FOR AFTERNOON RECESS)

38 (PROCEEDINGS RECONVENED)

39
40 THE REGISTRAR: The hearing is now resumed.

41
42 EXAMINATION IN CHIEF BY MS. BAKER, continuing:

43
44 Q Thank you. I'd like to now just ask a couple of
45 questions to you, Dr. Ross, about Kinder Morgan.
46 Now, is Mr. Di Franco there?

47 MR. DI FRANCO: Yes, I'm here.

1 Q Okay, thank you. Dr. Ross, there was a spill in
2 2007 in Burrard Inlet, and that was a spill from
3 the Kinder Morgan fuel line. Was DFO Science
4 brought in to that spill?

5 DR. ROSS: Not formally, as far as I know, no.

6 Q And, Mr. Di Franco, do you know if that was a
7 spill that was under the responsibility of Coast
8 Guard?

9 MR. DI FRANCO: No, it wasn't. It was a land-based
10 spill, so it was not under the mandate of Coast
11 Guard.

12 Q All right. Dr. Ross, were you aware of that spill
13 or of the response to the aquatic environment in
14 relation to that spill?

15 DR. ROSS: Coincidentally, I was in Burrard Inlet when
16 this happened. We were there with two small craft
17 and with my graduate students, my technician, Neil
18 Dangerfield, and some colleagues from Simon Fraser
19 University. So we were on team when this
20 happened, just coincidentally, doing live captures
21 and sampling of harbour seals for unrelated
22 studies of pollutants.

23 Q Okay. Did you have any concerns that there may be
24 issues relevant to anadromous fish or fish habitat
25 in relation to the spill in Burrard Inlet?

26 DR. ROSS: Well, we saw the booms out. We saw a
27 shoreline that was completely oiled. I believe
28 there were 240,000 litres of crude oil that
29 escaped. Much of that went into the local marine
30 environment. We saw probably 200 white-suited
31 either volunteers or paid contractors on the shore
32 with absorbent pads. We saw thick oil and sheens
33 within the boom and also outside the booms.

34 We went ahead, while I was on my phone trying
35 to secure insight and advice from some of my
36 colleagues who were more implicitly involved in
37 the incident command, but we went ahead with our
38 own work and we were live-capturing seals and
39 young seals, and we captured one young harbour
40 seal, probably four weeks old, who was 50 percent
41 covered in oil. This would have been right at the
42 end of Moody Arm, probably a full five kilometres
43 from the spill site.

44 At the time, I was deciding whether I should
45 take this harbour seal over to the Vancouver
46 Aquarium Marine Mammal Rescue Unit, because they
47 deal with either orphaned or sick injured seals,

1 but I decided that the seal was in good shape and
2 was still nursing with its mother, who was nearby,
3 and so we cleaned off the seal and released it.

4 So obviously I did have some first-hand
5 concerns and observations that biota were being
6 impacted.

7 Q And was there an avenue for that Science advice
8 that you or your group would have been able to
9 assist with their -- to get that advice to the
10 people doing the cleanup?

11 DR. ROSS: There was no avenue for me to provide direct
12 advice other than me phoning colleagues at
13 Habitat, Mr. Corino (sic), and that was probably
14 it. It's difficult to deal with communications
15 when you're in the field, but there was no formal
16 way for me to provide my advice.

17 Q And ultimately was Science advice contributed to
18 develop a monitoring plan or to develop a cleanup
19 plan for that spill?

20 DR. ROSS: The contracting party - and I can't remember
21 the name of the consulting firm - sent out a
22 representative with us where I pointed out one of
23 the adult harbour seals who was completely oiled
24 and was suffering from distress and looked as
25 though he had fairly extensive eye irritations. I
26 indicated it would be very difficult to capture
27 that adult, it was a large male, and he was on a
28 rock. But I did offer to, or suggest, that we
29 could capture seals nearby and take blood samples
30 and/or other samples in a minimally invasive
31 manner in support of understanding whether
32 hydrocarbons were being ingested.

33 I also did suggest, because we did have a
34 small sediment grab sample that we can just drop
35 off the side of the boat to grab surficial
36 sediments, so I offered to collect these sediment
37 samples and water samples to this contracting
38 party and this advice was also relayed via Mr.
39 Corino.

40 Q Corino Salomi?

41 DR. ROSS: Salomi Corino (sic) at our DFO Habitat
42 branch.

43 Q And was that offer taken up by the cleanup crew?

44 DR. ROSS: No.

45 Q I'd like to take you to an email that is in the
46 materials at Tab 10. It has another one of these
47 chains of emails, so I'd like to go to the back,

1 the very first email in that exchange, which is in
2 fact an email from Mr. Salomi, who you were
3 referring to there, and he has written an email
4 here to you, Mr. Reid, and others. I think, Dr.
5 Ross, you're copied on this email, and he says
6 that:

7
8 This week's oil spill in Burrard Inlet has
9 highlighted the need for DFO to update its
10 role during major pollution events. I
11 understand that this has been raised by
12 others recently as well. The following text
13 which I previously drafted with input from
14 Karen Hutton could provide the basis for a
15 regional discussion or briefing.
16

17 And then he sets out some language identifying
18 things such as DFO's involvement being initiated
19 through Environment Canada, through an Area
20 Director and through DFO -- excuse me.
21

22 From Environment Canada contracting an area
23 director through to an area chief, and then
24 the area biologist.
25

26 From the second paragraph. And he has a concern
27 that:

28
29 ...area biologists are generally able to
30 provide information on fish and habitat in a
31 given area, but most staff are not familiar
32 enough with oil or chemical spill impacts,
33 contaminant (sic) [containment], or clean-up
34 techniques to give practical or effective
35 support.
36

37 And so he says there is a regional meeting of
38 spill response agencies coming up where these
39 issues should be talked about and determined.

40 The bottom paragraph says:

41
42 The Department's current spill response
43 support capacity is limited and the
44 Department's expectations of area staff's
45 role in spill events needs to be clarified.
46

47 Et cetera.

1 Now, Dr. Ross, there's an email from you that
2 just follows this where you agree with his
3 comments. Do you see that? That's on the second
4 page. It says:

5
6 Hi Corino-

7
8 As discussed last week by phone, I share your
9 concerns about DFO's role in incidents such
10 as oil spills. I think the department is
11 vulnerable on both the assessment (including
12 Science advice) and the enforcement sides, as
13 EC is not in a logistical or intellectual
14 position to comprehensively address the
15 marine fish/marine mammal habitat aspects.
16

17 That is your email; is that right?

18 DR. ROSS: That's correct.

19 Q And that remains your view?

20 DR. ROSS: Well, I was simply offering to assist, if I
21 could, and I guess I felt professionally that DFO
22 was potentially facing some criticism if any of
23 these shortcomings did emerge in the media. I
24 thought it was my responsibility to raise these
25 concerns. And obviously if I'm raising concerns,
26 to try to proffer some constructive input.

27 We had just -- and this perhaps comes in the
28 trailing path of our program review for s. 36 and
29 DFO's toxichemical program which had essentially
30 been axed prior to this. So we felt a little bit
31 orphaned on the contaminant side, and that's not
32 always fun. But, at the same time, whether it's
33 DFO's responsibility or Environment Canada's
34 responsibility, I guess I felt that somebody has
35 to step in and do this kind of work, whether it's
36 from research perspective or monitoring
37 perspective, and we lacked clarity on who that
38 should be.

39 Q And that was something you felt needed to be
40 sorted out, clarified?

41 DR. ROSS: Yes.

42 Q And, then, Mr. Reid, following Dr. Ross's email,
43 there's an email from you which now, if we turn to
44 the very front page of this chain, you'll see it
45 at the bottom. It's from you to Kirsten Ruecker,
46 and you say:
47

1 To improve everyone's understanding of "who
2 does what" during a spill incident, I have
3 been asked to prepare a brief summary of
4 DFO's Pacific "current" roles and
5 responsibilities for spill incidents (both
6 marine and freshwater spills).
7

8 I just wanted to ask you, first of all, you
9 remember seeing this email chain?

10 MR. REID: Yes, I do recall this chain.

11 Q And at the very, very top message on this email
12 chain is again from Dr. Ross, and he asks in the
13 very last line:
14

15 Is there an appetite for OHEB to write a
16 Briefing Note that encapsulates 4-5
17 incidents, what we learned, how DFO was
18 'vulnerable' in terms of media/legal, and
19 where we should go?
20

21 So I'm just going to ask you overall did you take
22 these steps? Did you sort out who does what
23 during a spill incident? Did you prepare a
24 briefing note? What was the response to the
25 concerns that are articulated by Dr. Ross and
26 Corino Salomi in this email chain?

27 MR. REID: Yeah, so my role at that time was as
28 Regional Manager of our Habitat Program, and so
29 the first thing that we did when seeing this
30 incident is actually spend a little time with some
31 of my staff discussing what our role was. This
32 actually eventually led to one of my staff
33 preparing a deck which actually talks about the
34 different roles DFO has during a spill event.

35 There's different programs within DFO.
36 There's our OHEB, which is the Ocean Habitat
37 Enhancement Branch. There's our Fisheries
38 Management. There's the Conservation and
39 Protection, and there's our Science groups, who
40 all may have different roles during a spill.

41 So this eventually led to me providing a
42 presentation to managers, other OHEB managers
43 regarding a proposed role or confirming our role
44 in response to spills in this event.

45 Dr. Ross did refer to a change in DFO's
46 program in, I think, around 2004/2005. I had
47 another job at the time, but we used to have a

1 Water Quality Unit within our Habitat Program that
2 provided that support during a spill. That
3 program was changed to support physical habitat as
4 well as another program to do with federal
5 contaminated sites. So that expertise was no
6 longer available.

7 So some of the comments in this email are
8 frustrations around a change that occurred in
9 around 2004/2005 and a change to how do we respond
10 now in a different regime?

11 MS. BAKER: Could I have this --

12 Q Sorry, have you finished? Thank you.

13 MS. BAKER: Could I have this email chain marked as the
14 next exhibit, please?

15 THE REGISTRAR: Exhibit 1377, counsel.

16
17 EXHIBIT 1377: Email chain re "DFO and
18 Pollution response/support"
19

20 MS. BAKER:

21 Q And I will take you to a presentation which I
22 think you're referring to, but before I do that, I
23 would just like to turn to Tab 14 of the
24 Commission's list. This is another email from
25 you, Dr. Ross, and I just want to go down to the
26 bottom. You're writing to Corino Salomi again, at
27 the bottom of the first page.

28
29 The spills continue...!

30
31 I am not a crab expert...
32

33 And you go on to discuss some recent concerns.
34 And then at the first paragraph at the end, you
35 say:
36

37 Over the last 3.5 years, DFO viewed EC as the
38 lead agency, but as we have seen, there has
39 been little capacity or interest on EC's part
40 to adopt this role.
41

42 And that is with respect to marine impacts and
43 monitoring; is that right?

44 DR. ROSS: That would be correct.

45 Q Okay. And does that remain a concern of yours?

46 DR. ROSS: This remains a profound concern of mine,
47 yes.

89
PANEL NO. 53
In chief by Ms. Baker

1 MS. BAKER: I'll have that marked, please.

2 THE REGISTRAR: Exhibit 1378.

3

4 EXHIBIT 1378: Email chain re "Further to
5 Jeff Marliave's report of dead and moribund
6 crabs"

7

8 MS. BAKER:

9 Q And, Mr. Reid, if I could ask you to turn to Tab
10 39. This is a Powerpoint presentation, "Spill
11 Incident and Response, OHEB's Role". It's dated
12 December 6, 2007, which just follows the email
13 that we've been looking at. Is this the deck that
14 you were referring to?

15 MR. ROSS: That is correct.

16 MS. BAKER: I'll have that marked, please, as the next
17 exhibit.

18 THE REGISTRAR: Exhibit 1379.

19

20 EXHIBIT 1379: Powerpoint presentation titled
21 "Spill Incident and Response, OHEB's Role"
22 dated December 6, 2007

23

24 MS. BAKER:

25 Q I'd like to just turn to page 7 of this.
26 Unfortunately the pages aren't numbered, so we're
27 going to have to hope that the Powerpoint numbers
28 work. So at the top here, it says:

29

30 If DFO does not have a strong presence on
31 REET, DFO resources (fish and fish habitat)
32 are unlikely to properly identified,
33 protected, assessed and monitored.

34

35 I'd like to ask both Dr. Ross and Mr. Reid if that
36 is something that you agree with, that statement?

37 DR. ROSS: I most certainly agree with the statement,
38 and I feel as though many of the experts, both in
39 Habitat and within Science, as well as obviously
40 Coast Guard, which I presume is excluded from this
41 statement, there's an abundance of expertise
42 within the agency we know as Fisheries and Oceans
43 Canada, to participate and contribute to an
44 effective REET, and to help to mitigate impacts on
45 natural resources, and also to help guide cleanups
46 and potentially also to support enforcement or the
47 pursuit of charges.

August 17, 2011

1 Q And, Mr. Reid, do you agree with that as well?
2 MR. REID: Yeah, I agree with the statement. I think
3 the key word is "properly identified". I think in
4 the absence of DFO advice, there likely would be
5 some effort to identify, but they may not be
6 properly identified.

7 Q Can you turn to the next page, the next two pages.
8 I'll start with page 8. So this has a "Spill
9 Response" flow chart, I guess, and it follows over
10 onto the following page, page 9, and sets out the
11 Area Director responsibility for REET. I wanted
12 to just confirm whether that approach was
13 discussed with the managers and whether that was
14 accepted by them?

15 MR. REID: This particular presentation, I gave to --
16 actually one of my staff gave to other OHEG
17 managers that are in five different areas around
18 the province, and my recollection was that they
19 supported the approach of having the Area Director
20 as the first point of contact in the event of a
21 spill when a REET is formed. The reasons for that
22 are that the Area Director has authority to engage
23 staff in a local area, local office, that can
24 deploy Habitat biologists to do some surveys of
25 beaches. They can deploy -- they can close
26 fisheries in the event that a fishery is taking
27 place and there's a spill event. They also have
28 local knowledge as well.

29 Q And then the next page, the page that's on the
30 screen right now at the very bottom, it says:

31
32 Recommend OHEB RHQ provide coordinator to
33 address the above issues, for the interim.
34

35 Did that happen? Is there a person in DFO who
36 coordinates the DFO response to each spill?

37 MR. REID: There presently is no specific individual
38 who's been identified to coordinate on behalf of
39 DFO or within the OHEB, now called Ecosystems
40 Management Branch.

41 Q Has this flow chart that we just looked at, and
42 the recommendations on the following page, have
43 those been approved or adopted in any way, or are
44 they simply a presentation that you made?

45 MR. REID: The approach was discussed with the Regional
46 Director who was my direct report at the time, and
47 my recollection was generally supported. I'm not

1 sure who she discussed beyond that, though.
2 Q On the very last page of this document, there's a
3 heading "Next Steps". It says:

- 4
5 • Finalize procedure
6 • Discuss with Regional Director [RG]
7 • Discuss with Area Directors
8 • Advise RDG
9

10 Did those steps happen? Has that been
11 implemented?

12 MR. REID: As I mentioned, I recall discussing the
13 procedure with Regional Director. My
14 understanding is she had some discussions with
15 Area Directors. I'm not able to speak on whether
16 she discussed this particular procedure with the
17 Regional Director General.

18 Q All right. If it had gone to the Regional
19 Director General, would there be a decision memo
20 with procedures attached that would come back and
21 inform you a decision had been made?

22 MR. REID: Normally that would be the case. What I can
23 say is that the Regional Director General at the
24 time of the Robson Bight spill was being advised
25 of the REET process, and I also know in 2009,
26 Environment Canada actually gave a presentation to
27 our Regional Management Committee, which is made
28 up of all the Regional Directors chaired by the
29 Regional Director General, about REET.

30 Also currently there are discussions between
31 DFO directors and Environment Canada directors
32 just to confirm the role of DFO and REET. They're
33 happening right now.

34 Q Do you know if Environment Canada has ever
35 confirmed its understanding of this process? Has
36 there been that next layer of communication where
37 DFO and Environment Canada get on the same page
38 with who is doing what on a spill?

39 MR. REID: I believe there's been some informal
40 discussions and there are some discussions planned
41 in the near future, I think in September.

42 Q I'd like to move to another topic. This is marine
43 contaminates. Now, Dr. Ross, we've had evidence
44 in this inquiry on freshwater contaminants and on
45 different contaminant impacts, so we might be able
46 to move fairly quickly through this. What I'd
47 like to ask you is whether the marine environment

1 can be affected by chronic low level releases of
2 contaminants?

3 DR. ROSS: Yes. Certainly we know from extensive
4 research, both in British Columbia, Washington
5 State and internationally, that organisms, fish
6 and invertebrates and marine mammals indeed living
7 near urban centres or near major industrial sites
8 often have higher levels of a variety of nasty
9 chemicals, and we also see affects on their health
10 in different ways. We have probably 20 papers and
11 publications from Puget Sound showing that
12 resident non-migrating fish have an abundance of
13 liver tumours and skin lesions, and this would be
14 associated with PCBs and hydrocarbons in urban
15 centres.

16 So we know that marine pollutants are a
17 problem in certainly both our areas, and we
18 certainly know as sockeye would be leaving the
19 Fraser estuary, they still have to navigate marine
20 waters which are the receiving end of numerous
21 important point sources of environmental
22 contaminants.

23 I would certainly note major pulp mills. We
24 know from history of scientific research and
25 monitoring there that dioxins and furans were a
26 major problem and have resulted -- from pulp
27 mills. We've since rectified that with pulp mill
28 regulations. But the presence of high levels of
29 dioxins continues to result in the closure of as
30 much as 1200 hectares of commercial fishing in
31 areas of the B.C. coast.

32 So we know that there are important sources
33 of nasty contaminants that are of concern to biota
34 and to humans. If we look at the coastline, we've
35 got major sewage outfalls.

36 I note that the interest in the **Oceans Act**
37 and the Pacific North Coast Integrated Management
38 Area, we did a survey of contaminant sources in
39 the PNCIMA area, and that stretches from
40 essentially the Alaska border down to Campbell
41 River. It's most of our coastline. Human
42 population is 130,000. We estimated in 2004 in
43 our paper that 1.5 million cruise ship passengers
44 transit those waters, and those cruise ships will
45 be releasing a lot of domestic sewage and all the
46 pharmaceuticals used by the persons on board and a
47 number of other contaminants.

1 So we know there are a lot of contaminants
2 being released into marine waters along the
3 coastline of British Columbia. But we also know
4 that salmonids head to sea, feed and grow out in
5 the pasture we know is the North Pacific Ocean,
6 and relying on the food web in such a remote area,
7 they still accumulate notable concentrations of
8 persistent contaminants such as PCBs, DDT,
9 endosulfan, PBDEs, etc. Probably the majority of
10 these contaminants would be deposited into the
11 North Pacific from Asian sources.

12 We published a paper in 2007 that estimated
13 that as much as 40 percent of the PBDEs in the
14 British Columbia coastal air are coming from Asia.
15 It would only take seven to ten days for those
16 contaminants to get to our coastline.

17 So we know that salmonids are exposed to
18 global pollutants through their time at sea, and
19 that they bring these back with them. And as they
20 head back into the freshwater environment, they're
21 burning off their fat, they're heading upstream,
22 these chemicals are found in the remaining
23 reserves of fat at concentrations that are
24 increasing as they burn off fat, because we're
25 getting persistent chemicals remaining behind in a
26 dwindling reserve of fat. That becomes a
27 biological concern or of concern to the health of
28 the returning sockeye and the eggs they lay back
29 in their natal stream.

30 Q Is there any current research being conducted on
31 marine contaminants that could affect Fraser River
32 sockeye by DFO Science?

33 DR. ROSS: We have published a couple of papers, and
34 colleagues of mine, Michael Ikonomou and others,
35 Rob Macdonald, all three of us have published
36 separate papers on what we would term the
37 biological importation of persistent contaminants
38 by salmon into freshwater ecosystem.

39 Q Is that current work that's being done?

40 DR. ROSS: No, these are all published.

41 Q Is there any current work being done?

42 DR. ROSS: No, there is no funding available to us to
43 continue any work on salmon, other than a small
44 program I have in collaboration with Chris Kennedy
45 at Simon Fraser University looking at the effect
46 of the single pesticide exposures to salmon.

47 Q Ecosystem management has been identified by the

1 approach taken by the DFO Science in its work.
2 Are contaminants in the marine environment
3 relevant to an ecosystem approach?

4 DR. ROSS: Well, personally, I would consider
5 environmental contaminants to be one of the
6 priorities on a global scale. If we look at any
7 other jurisdiction, including the United States,
8 marine pollution is considered usually in the top
9 four of threats in the marine environment, so I
10 would consider environmental contaminants to be an
11 important component of marine environmental
12 quality as we look at the environment, or as an
13 important component of ecosystem-based management,
14 yes.

15 Q Today we've had marked as Exhibit 1371 which is an
16 updated briefing note, 2011, on the 2009 Fraser
17 sockeye return. Have you seen that document
18 before?

19 DR. ROSS: The first time I saw it was during my
20 testimony on June 14th, for the wastewater
21 hearings.

22 Q Okay. At page 3 of this document -- there, stop
23 there. Maybe I've got this wrong. Sorry,
24 further, page 2 of the memo so it would be one
25 page earlier. There.

26 Under the first bullet underneath "Analysis
27 and DFO Comment", it says:

28
29 Based on the most recent analyses, the
30 following factors are unlikely to have
31 contributed to the poor 2009 return.
32

33 And they identify pollution and contaminants in
34 the Fraser River, so that's the first point. Do
35 you agree with that?

36 DR. ROSS: No, I do not.

37 Q Okay. Then what about marine contaminants -- that
38 doesn't seem to be in this memo anywhere. We've
39 got Fraser river contaminants, but what about
40 contaminants in the marine environment? Has that
41 hypothesis ever been considered by DFO Science?

42 DR. ROSS: Well, certainly I was a participant at some
43 of the workshops over the years, including the
44 late-run sockeye crisis in the late 1990s, and we
45 explored a number of different hypotheses where
46 pollutants might have played a role in either
47 acutely harming sockeye salmon, or indirectly

1 harming them in a developmental sense.

2 A lot of the chemicals of concern today will
3 not result in a belly-up incident with a major
4 fish kill. A lot of the pollutants that we have
5 out there will result in chronic exposures, low-
6 level effects, developmental anomalies which
7 essentially contribute to weakening the fish,
8 whether it's a fish that is heading out to sea
9 with an immune system that is vulnerable to this
10 kind of toxicity or behaviour or olfaction or
11 energetics. A lot of the endocrine disrupting
12 pollutants that we think of today, including the
13 persistent chemicals, including a lot of hormones,
14 including a lot of pharmaceuticals, are ones that
15 can cause and affect well beyond the time of
16 exposure.

17 Q Where would you prioritize research on marine
18 contaminants today?

19 DR. ROSS: Where would I prioritize them?

20 Q Yeah. Like how would you -- I take it you would
21 agree that more research needs to be done on
22 marine contaminants. How would you prioritize
23 that work that needs to be done?

24 DR. ROSS: Well, I would compare with a lot of the
25 other global assessments, either through the
26 United Nations Environment Program or NOAA, that
27 pollution is a major threat to the biota for which
28 we have a responsibility to manage in the ocean.
29 I'm a toxicologist. I would be self-serving to
30 suggest further, but I am in the business of
31 trying to figure out which contaminants we should
32 be worried about out of the 25,000-odd chemicals
33 in Canada and the 80,000 medicinal compounds.

34 I guess I'd have to admit that I do not feel
35 as though I have the tools to be able to offer as
36 much insight as I would like to be able to offer
37 at these hearings, and I think, personally, it is
38 very important for Canada to decide how it will
39 support or navigate the whole question of
40 research, monitoring and enforcement of
41 environmental contaminants in the marine
42 environment.

43 Q All right. And if I could just ask you to
44 identify Exhibit 1364 as the summary report from
45 the "DFO Synthesis Workshop" in April of this
46 year, and on page 6 of that document, "Information
47 and Research Needs" are set out under a heading,

1 "Contaminants - Peter Ross", and I take it you
2 would adopt that or confirm those research needs
3 still?

4 DR. ROSS: I haven't seen this in a while, but I'm sure
5 I drafted this. You know, I can make
6 recommendations and I think it's important to look
7 at these, and the Macdonald report, number 2, for
8 your Commission also made a number of excellent
9 recommendations. And I think both of us would
10 strongly agree with the fact that we're in a very
11 poor position to be able to rule out contaminants.
12 An absence of data, or an absence of evidence to
13 me is not evidence of absence, and I think it's a
14 little bit dangerous to use an absence of data or
15 an absence of evidence to suggest that
16 contaminants play no role whatsoever or are indeed
17 unlikely to play a role.

18 I think it gives short shrift to the examples
19 we have from other parts of Canada with salmon
20 that have been dramatically impacted by acid rain
21 in Eastern Canada, and aluminum and copper and
22 pesticides in New Brunswick. It gives short
23 shrift to the evidence we have from our
24 colleagues, our federal colleagues to the south of
25 us where we see chinook salmon returning to Puget
26 Sound that are being affected by urban
27 contaminants.

28 So these are some specific examples. Other
29 scientists, other toxicologists might have a
30 slightly different view, but clearly we're data-
31 deficient in terms of our current capacity to
32 understand what's happening with the sockeye
33 situation.

34 Q Thank you. My last question is for you, Mr. Reid,
35 and it's the question referencing document at Tab
36 25 of the commission's brief. It's a document
37 entitled "Canada's Ocean Strategy" and it's from
38 2006. There's just one question I wanted to ask
39 you out of this document. On page 23, which would
40 be a little bit further down there, the paragraph
41 I want to take you to is under "Conservation and
42 Protection of Marine Environment" and I just want
43 to ask you, it says under the third point here [as
44 read]:

45
46 Establish and implement a marine
47 environmental quality policy and operational

1 framework under the *Oceans Act*...

2
3 Has that happened? Has a marine environmental
4 quality policy and operational framework been
5 developed?

6 MR. REID: No, it has not been developed.

7 Q And why not?

8 MR. REID: I gather when the people started analyzing
9 how to develop a marine environmental quality
10 policy framework - I wasn't actually in the Oceans
11 program at the time, so this is what I've been
12 advised - that they realized that before they
13 could actually come up with a policy and
14 operational framework, they really had to come up
15 with tools to describe the ecosystem, and so there
16 was an evolution or a shift from actually focusing
17 work on developing REET environmental quality
18 policy framework to actually describing
19 ecosystems, marine ecosystems in the country. So
20 tools that were -- documents that were produced
21 that included ecosystem overview assessments,
22 there was documents that described ecologically
23 and biologically sensitive areas as well as there
24 was some seabed mapping work done, as well as work
25 to -- what I call ecosystem approach, or ecosystem
26 objectives or conservation objectives.
27 Essentially those are describing a specific
28 environment and what you were trying to achieve by
29 sustaining that particular feature.

30 So there was a shift, and as a consequence,
31 there was never a policy of operational framework
32 completed.

33 MS. BAKER: Mr. Commissioner, we have a lot to cover
34 tomorrow. I don't know if there's any opportunity
35 to stay for a little bit and let Canada start
36 their cross-examination of these witnesses for ten
37 minutes even.

38 THE COMMISSIONER: I think we could do ten minutes, but
39 that would be max.

40 MS. BAKER: Okay. Thank you.

41 MR. TIMBERG: It's Tim Timberg with Geneva Grande-
42 McNeill for Canada.

43
44 CROSS-EXAMINATION BY MR. TIMBERG:

45
46 Q Mr. Di Franco, I have a few questions for
47 yourself. Can you hear me?

1 MR. DI FRANCO: Yes, go ahead.

2 Q Thank you. We've heard about -- we discussed
3 today from large-scale incidents like those at
4 Robson Bight and Burrard Inlet. Can you give us a
5 background on how frequent those large-scale
6 incidents are as compared to smaller spills?

7 MR. DI FRANCO: Well, like I've mentioned earlier in
8 the day, the larger scale incidents that you see,
9 Robson Bight, Squamish Terminals or Burrard Inlet,
10 those are -- those are fairly rare compared to the
11 other spills that we deal with.

12 The Pacific Region reports approximately 600
13 marine pollution incidents a year, and the
14 majority of those are small, you know, tiny, small
15 insignificant incidents. The occurrence of larger
16 incidents are very rare, I would say, perhaps one,
17 maybe two, a year is my experience of what I've
18 seen on the west coast.

19 Q Thank you. We've talked about or heard a lot of
20 evidence about the scientific and technical advice
21 that the REET provides to the Coast Guard when the
22 REET is activated. Can you tell us what expertise
23 of its own does the Coast Guard bring to bear in
24 response to a spill?

25 MR. DI FRANCO: Well, the Coast Guard will bring a
26 variety of expertise to a marine pollution
27 incident. Basically what the Coast Guard brings
28 is, in a nutshell, operational experience,
29 response management, technical experience,
30 logistical experience, public relations, liaison
31 function with the public and other stakeholders.

32 Members of the Canadian Coast Guard have
33 many, many years of experience in dealing with
34 marine pollution incidents and a lot of our
35 members spend their entire careers with
36 environmental response, so they have extensive
37 experience in dealing with marine pollution
38 incidents, so there's a wide variety of expertise
39 that pertain -- Coast Guard brings to a spill,
40 including, as well, experience in dealing with
41 polluters. Some of them can be hostile, some of
42 them not so hostile. The Canadian Coast Guard has
43 a lot of experience in knowing how to deal with
44 individuals of all stripes.

45 Q Thank you. And can you tell us whether there are
46 any structural advantages to having Canadian Coast
47 Guard as a first responder?

1 MR. DI FRANCO: Well, the Coast Guard, because we've
2 been around for so long, especially among the
3 response division -- we're set up like a response
4 organization, so there's a notification system.
5 There's a 1-800 number established. We have duty
6 officers that are on call 24-7. We have
7 approximately a staff of 75 individuals across the
8 country that are within the environmental response
9 program. We have approximately 80 response
10 equipment depot sites strategically located across
11 the country and which can be cascaded to any
12 region if a significant spill were to occur.

13 We have the vessel support, logistical
14 support, air support, great liaison relationships
15 with other departments including Transport Canada,
16 Environment Canada and public safety. And, of
17 course, the experience that our personnel have
18 within the regions is also a great asset.

19 MR. TIMBERG: Thank you. And if, Mr. Registrar, we can
20 turn to Canada's Tab 1, which is the National
21 Contingency Plan.

22 Q I'm wondering, Mr. Di Franco, do you have this in
23 front of you, the "Canadian Coast Guard
24 Environmental Response, Marine Spills Contingency
25 Plan"?

26 MR. DI FRANCO: Yes, I do, now I do.

27 Q Okay, thank you. And can you explain what this
28 document does, who created it and what it sets out
29 to explain?

30 MR. DI FRANCO: Well, the National Marine Spills
31 Contingency Plan, the national chapter is
32 basically the framework or the guideline -- the
33 guidelines through which the Canadian Coast Guard
34 operates or uses when it responds to a marine
35 pollution incident. It explains the how, where,
36 when, why of marine pollution response with
37 respect to the Coast Guard.

38 This document was written at headquarters and
39 it is entitled, "The National Chapter", and within
40 the national chapter there are regional chapters,
41 Pacific, Central, Arctic, Maritimes, Quebec and
42 Newfoundland regional chapters which further
43 details how the Canadian Coast Guard will
44 implement the operational aspects of a response to
45 a marine pollution incident. This document
46 basically is our Bible and lays out the
47 legislative framework, our mandate for doing what

1 we do. It explains the types of spills that we
2 respond to, the ones that we're lead agency, the
3 ones where we're not lead agency, and the ones
4 where we're resource agency where we can provide
5 resources to another lead agency. It explains the
6 geographic area of response that we cover.

7 Q Okay. So we can use that document.

8 MR. DI FRANCO: Yes, totally.

9 Q Thank you. All right. Dr. Ross, I have some
10 questions for yourself.

11 MR. TIMBERG: And if we could turn, Mr. Registrar, to
12 Canada's Tab 46, and if we could have that, before
13 we move on, thank you, if we could have the
14 Canadian Coast Guard Environmental Response marked
15 as the next exhibit.

16 THE REGISTRAR: It will be marked as 1380.

17

18 EXHIBIT 1380: Document titled "Canadian
19 Coast Guard Environmental Response"
20

21 MR. TIMBERG: Thank you.

22 Q Dr. Ross, could you identify what this document
23 is?

24 DR. ROSS: Yes, I believe this was a presentation that
25 I gave to a DFO Science workshop this spring of
26 2011.

27 Q Okay. And what was the purpose of that workshop
28 this spring?

29 DR. ROSS: That was part of DFO's internal scientific
30 efforts to sort of collate all the available
31 expertise to try to determine some of the factors
32 that may have been underlying the decline of
33 Fraser sockeye over a decadal time span, or a
34 couple of decades, as well as the disastrous 2009
35 return.

36 This presentation drew on the collective
37 experience of a number of parties, colleagues from
38 Simon Fraser University with whom we'd been
39 collaborating on the effects of pesticides,
40 currently used pesticides on a variety of salmon
41 species, colleagues who work on biology and
42 ecology of Fraser River sockeye salmon, and Wayne
43 Fairchild, who is an expert on the east coast who
44 is the lead in identifying a forest-applied
45 pesticide as responsible for the loss of millions
46 of returning Atlantic salmon in a series of papers
47 over the last ten or 12 years.

1 So, really, this was just an attempt to
2 collate available information in a risk-assessment
3 habitat paradigm in support of our understanding
4 sockeye.

5 Q And just so we're clear on the record, this was
6 the presentation that followed up on the Pacific
7 Salmon Commission meeting in June of 2010 on the
8 various possible causes of decline of Fraser River
9 sockeye salmon.

10 DR. ROSS: This would be a follow up. I was not
11 present at that Pacific Salmon Commission meeting.

12 Q But you provided this presentation at the follow-
13 up meeting?

14 DR. ROSS: Yes, that's correct.

15 Q And how was this presentation relevant to Fraser
16 River sockeye salmon and marine waters?

17 DR. ROSS: Well, one of the concerns that I retain with
18 regard to Fraser River sockeye is this notion that
19 continues to be put forth at some of our workshops
20 and elsewhere that what we expect to find are
21 hundreds, if not thousands of belly-up fish in a
22 lake or beside a pulp mill or in the Strait of
23 Georgia that would give us evidence that a
24 pollution spill might have been a causal factor or
25 driver of what we've been observing.

26 Although this is not to be discounted, it is
27 indeed possible that a single point source or a
28 single chemical could have and has, upon occasion,
29 contributed to such events, that's clearly not the
30 norm. In fact, a lot of the chemicals that we use
31 today are ones that don't dissolve in water, that
32 are persistent, they get in the food webs, that
33 are not acute poisons. A lot of these same
34 chemicals we would find are now in bodies.
35 They're not killing us outright, but we remain
36 fundamentally concerned and we tried to express
37 that in this paper, that Fraser River sockeye have
38 to run by a gauntlet of point sources and they're
39 exposed to a lifetime of exposures with many of
40 these contaminants being accumulated in their
41 tissues, not being eliminated. And we raise the
42 concern based on an abundance of literature from
43 elsewhere, that we may be sending very small
44 Fraser River sockeye smolts to sea weakened, not
45 in tiptop shape, perhaps predisposed to disease,
46 perhaps predisposed to slight behavioural
47 anomalies, predisposed to not being able to smell

1 quite properly. All of these things are very,
2 very important to the salmon that have to navigate
3 this lengthy corridor, head out to sea and then
4 come back and find their natal stream.

5 So we do remain concerned that there may be
6 long-term insidious effects of a number of
7 different contaminants that may simply weaken the
8 fish in the face of a disease that comes along or
9 a parasite or climate stress, and contribute to
10 the cumulative impacts of the population level.

11 MR. TIMBERG: Thank you. Mr. Commissioner, we'll go
12 through his workshop tomorrow morning.

13 THE COMMISSIONER: Thank you very much, Mr. Timberg.

14 THE REGISTRAR: Did you wish that last document marked?

15 MR. TIMBERG: If we could. Thank you.

16 THE REGISTRAR: That will be marked as Exhibit 1381.

17
18 EXHIBIT 1381: Presentation titled "Salmon
19 are Sensitive: Life history, habitat and
20 contaminants"
21

22 THE REGISTRAR: The hearing is now adjourned for the
23 day and will resume at ten o'clock tomorrow
24 morning.
25

26 (PROCEEDINGS ADJOURNED AT 4:10 P.M. TO AUGUST
27 18, 2011 AT 10:00 A.M.)
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33 I HEREBY CERTIFY the foregoing to be a true
34 and accurate transcript of the evidence
35 recorded on a sound recording apparatus,
36 transcribed to the best of my skill and
37 ability, and in accordance with applicable
38 standards.
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Irene Lim

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Diane Rochfort