

A P P E A R A N C E S

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A P P E A R A N C E S (Continued)

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Cullen Stephenson, Department of Ecology
Joe Stohr, Department of Fish and Wildlife
Dennis Moss, Utilities and Transportation Commission
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Ken Stone, Department of Transportation
Bryan Snodgrass, City of Vancouver
Greg Shafer, Clark County
Larry Paulson, Port of Vancouver

A P P E A R A N C E S (Continued)

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A P P E A R A N C E S (Continued)

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ALSO PRESENT:

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HEARING
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1 PROCEEDING

2 JUDGE NOBLE: We're ready to go back on the
3 record. We are back on the record in the State of
4 Washington Energy Facility Siting Council Case
5 Number 15-001, Member Application Number 2013-01 Tesoro
6 Savage LLC, Vancouver Energy Distribution Terminal.

7 It's my understanding that the proponents
8 have Mr. Hollingsed ready?

9 MR. DERR: It's Ms. Hollingsed, yes. The
10 applicant would like to call Michelle Hollingsed to the
11 stand.

12 JUDGE NOBLE: While she's coming up, I want
13 to thank everyone for their patience. We're in a
14 smaller room today and everyone should let me know if
15 they've having any issues relating to that.

16 MICHELLE HOLLINGSSED,
17 having been first duly sworn, testified as follows:

18 JUDGE NOBLE: Mr. Derr.

19 MR. DERR: Thank you.

20 If I may, given the setup, I'm going to move
21 to the table here so she doesn't have to flip her head
22 back and forth quite so far.

23 JUDGE NOBLE: That's a good idea. We'll
24 call that the hot seat.

25 ///

DERR / HOLLINGSSED

DIRECT EXAMINATION

1
2 BY MR. DERR:

3 Q. Ms. Hollingsed, I have on the table there for
4 you some documents that are exhibits in the record so
5 there may be an occasion where we refer to prefiled
6 testimony or an exhibit, and because right now the setup
7 is it's going to show behind you.

8 A. Okay.

9 Q. So it may be easier to refer to the notebook in
10 front of you.

11 Ms. Hollingsed, would you start by stating and
12 spelling your name for the record.

13 A. Sure. My name is Michelle Hollingsed. You
14 spell that M-i-c-h-e-l-l-e, H-o-l-l-i-n-g-s-e-d.

15 Q. Thank you.

16 Can you briefly describe your educational
17 credentials and experience in the insurance risk
18 industry?

19 A. I have a degree in accounting and a master of
20 business administration from the University of Utah. I
21 have my CPA license. In terms of insurance, I have a
22 CPCU, which stands for certified property casualty
23 underwriter. It would be similar to a CPA test if all
24 nine tests had to be taken at the same time but,
25 fortunately, they're not taken. I have my Certified

DERR / HOLLINGSIED

1 Risk Manager designation as well.

2 **Q. Thank you.**

3 **Have you worked as an underwriter in the**
4 **insurance industry?**

5 A. Yes. I worked for WCF of Utah for over five
6 years. I started in the accounting department and then
7 moved to the large account risk management department
8 where we price premium for large policyholders. So we
9 would look at their particular risks, we would look at
10 their claim experience, their safety controls, their
11 expenses, and then provide a final premium number.

12 **Q. And have you worked as a broker?**

13 A. Yes. I worked for Marsh, Marsh is the world's
14 largest insurance broker, for eight years. I was a
15 casualty client advisor. So I worked with large
16 companies, large multi-million, billion-dollar
17 companies, helped them assess their casualty risks, and
18 then negotiate with carriers for the best terms in
19 price.

20 In the last three years I moved to the role of
21 client manager, and in that role I worked with placement
22 teams throughout the company to place all of the
23 insurance policies for them. And throughout that whole
24 time Savage was one of my clients.

25 **Q. And have you worked as a risk manager?**

DERR / HOLLINGSIED

1 A. Yes. I'm currently a risk manager. I work with
2 Savage. I have been with Savage for five and a half
3 years. And our group places the insurance policies for
4 the company. We have a wide variety of risks since
5 we're a supply chain solutions company, so we have to
6 look at risks in the oil and gas, transportation, rail,
7 marine, and we need to make sure we have adequate
8 coverage for that.

9 So as a result, we have 75 insurance policies
10 that we manage. We also place over 20 performance
11 bonds. We manage a total cost of risk budget of
12 17 million, so that includes premiums, losses, the
13 amount to cover the losses.

14 **Q. And do these roles that you've held in the**
15 **insurance industry give you a thorough understanding of**
16 **insurance or other financial assurance issues that arise**
17 **with ownership and operation of a facility similar to**
18 **the Vancouver Energy terminal?**

19 A. Yes. I would also add that I place the
20 insurance for three joint ventures that Savage is a part
21 of. Vancouver Energy would actually be the fourth joint
22 venture that I've worked in. So yes, I feel that
23 qualifies me.

24 **Q. Thank you.**

25 **And what's your current position at Savage?**

DERR / HOLLINGSSED

1 A. I'm the vice president of risk management.

2 Q. And is it your responsibility there to manage
3 the insurance bonds and other risk management
4 instruments for the Vancouver Energy terminal?

5 A. Yes, that will be my responsibility.

6 Q. To prepare your testimony today, have you
7 reviewed the prefiled testimony of Robert Blackburn?

8 A. Yes.

9 Q. How about Eric English and James Holmes and the
10 report that was attached to their testimony called the
11 Abt Associates Report?

12 A. Yes.

13 Q. Are you generally familiar with EFSEC
14 regulations that address requirements for financial
15 assurances for the project, both pollution, liability
16 and decommissioning?

17 A. Yes.

18 Q. Maybe before we go into the details, can you
19 just briefly describe the difference between what a bond
20 is used for and what liability insurance is used for?

21 A. Okay. So a bond covers future potential
22 actions. So the company that is being bonded has
23 committed to perform a future act. The bond stands
24 behind that promise to perform, so if for some reason
25 the company did not perform those acts, the indemnitee

DERR / HOLLINGSIED

1 would receive the proceeds from the bonding company to
2 then complete the act.

3 So in our case, we have committed to restore the
4 facility to preconstruction site through
5 decommissioning. The intent is we will perform that, we
6 will do that; however, the bonding company stands behind
7 our commitment.

8 **Q. And how about liability insurance; what kinds of**
9 **issues does that cover?**

10 A. Well, insurance is different from bonding
11 because after we pay our premium we've actually
12 transferred any potential claims to the insurance
13 company. So if a claim occurs, they will pay that. We
14 are not expected to pay that claim.

15 **Q. Thank you.**

16 **Let's start with the decommissioning obligation.**

17 MR. DERR: Ms. Mastro, if you could put up
18 Exhibit 278.

19 BY MR. DERR:

20 **Q. And we'll start with Page 1 to get you familiar**
21 **with it, and there should be a copy of it there in the**
22 **notebook if you don't want to look backwards. Get the**
23 **system warmed up this morning. There it is.**

24 Do you recognize this exhibit which was
25 discussed by David Corpron in his testimony?

DERR / HOLLINGSIED

1 A. Yes.

2 MR. DERR: Ms. Mastro, if you could turn to
3 Page 2 of that document.

4 BY MR. DERR:

5 Q. If you go down to the bottom, do you see a sort
6 of a total at the very bottom of Page 2?

7 A. Yes. \$11,216,650.

8 Q. So based on that estimate in Exhibit 278, do you
9 believe Tesoro Savage Petroleum Terminal LLC will be
10 able to obtain a performance bond in that range to
11 address the requirements specified in the EFSEC
12 regulations for decommissioning?

13 A. Yes.

14 Q. What if the final decommissioning estimate,
15 which gets prepared after there are final construction
16 drawings, is higher, say as much as \$20 million? Will
17 the joint venture be able to obtain a performance bond
18 for that amount?

19 A. Yes.

20 Q. And what if after decommissioning of the
21 facility there were soil contamination issues that
22 needed to be addressed above the cost estimates
23 contained in this exhibit? Would that coverage be
24 covered by the decommissioning bond or with some other
25 method?

DERR / HOLLINGSSED

1 A. The bond would not respond. In that instance,
2 we would purchase insurance, and if there was a
3 pollution incident, the insurance would pay the cost to
4 clean up.

5 **Q. The next one, turn to the liability insurance**
6 **coverages and we'll start with the requirements in the**
7 **Port lease.**

8 MR. DERR: Ms. Mastro, if you could pull up
9 Exhibit 3068, and we'll be looking at Pages 9 and 10.

10 BY MR. DERR:

11 **Q. Ms. Hollingsed, are you generally familiar with**
12 **the liability insurance coverages that are required in**
13 **the Port lease?**

14 A. Yes.

15 **Q. And referring your attention to Page 9, Item J,**
16 **Property Insurance, Item K, Liability Insurance, and**
17 **then it carries over.**

18 **Can you just briefly summarize those**
19 **requirements in the Port lease?**

20 A. Okay. First, we are required to insure the
21 property, to purchase a property policy that would cover
22 damage or destruction to the facility so that the
23 facility would be repaired or rebuilt at current
24 construction prices. So that's called replacement cost.

25 In addition, we are required to place a general

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1 liability policy. That covers third-party liability for
2 bodily injury and property damage. That amount is
3 10 million per occurrence, and a 15 million aggregate,
4 so that means there can be more than one claim in a
5 policy year.

6 In addition, while the facility is being
7 constructed, we will place a contractor's pollution
8 liability policy. Now, this responds only while the
9 facility is being constructed. It would apply to our
10 acts, as well as any subcontractors' acts onsite, and
11 would cover any pollution that was created due to
12 construction.

13 Once the facility is operational, we are
14 required to place a pollution legal liability policy.
15 That covers sudden and accidental pollution that occurs
16 on our site and leaves the site, as well as gradual
17 pollution coverage. And that amount is \$25 million.

18 In addition, we have to place workers'
19 compensation for our employees and a small auto
20 liability policy with limits of \$1 million.

21 MR. DERR: If I might just, Ms. Mastro, ask
22 you to put up briefly Page 10 of 3068. Really, just for
23 council's benefit, that's the Pollution Legal Liability
24 Insurance is Paragraph L.

25 BY MR. DERR:

DERR / HOLLINGSIED

1 **Q. Will those lease amounts be all the insurance**
2 **coverage that Tesoro Savage obtains for this project?**

3 A. No. The lease is written in terms of this is
4 the minimum coverage that you have to obtain, so that
5 establishes the floor. But in terms of general
6 liability, pollution legal liability, it is the intent
7 that we will place limits above those minimum amounts.

8 **Q. Can you describe your knowledge and experience**
9 **with liability insurance coverages for other Savage**
10 **operations similar to the Vancouver Energy terminal?**

11 A. Yes. We have a crude oil terminal in Trenton,
12 North Dakota. We have five storage tanks; we can store
13 542,000 barrels. We receive crude oil from truck as
14 well as pipelines and then, ultimately, we load unit
15 trains.

16 We also work at five facilities in the U.S. and
17 Canada where we both load and unload crude, including
18 the Tesoro facility in Anacortes, Washington. We work
19 at that facility as well.

20 In terms of the liability exposure, we actually
21 have 12 marine locations where we load and unload
22 vessels and barges. We handle food by-products,
23 petroleum coke, and molten sulfur.

24 **Q. Could you, based on that experience, describe**
25 **Savage Services' corporate culture or approach to**

DERR / HOLLINGSIED

1 ensuring against risk such as might occur at the
2 Vancouver Energy Terminal?

3 A. Yes. So our approach is a conservative one.
4 First we need to understand the risks and we need to
5 make sure and have limits adequate to protect the
6 company's assets, so we're very conservative about that.
7 And I would expect we would take this same approach with
8 the joint venture.

9 **Q. How do you go about determining how much**
10 **liability insurance coverage is appropriate for a**
11 **project like this?**

12 A. We start with a contract, but like I said, that
13 really establishes the floor. I can't think of a
14 situation where we have only purchased coverages
15 required by contract because it's my job to insure for
16 all of the risks.

17 So I use Marsh and their database, since they
18 broker the largest number of companies. And I ask them
19 to benchmark and show me, well, what do limits carried
20 by our peer, what do those look like.

21 They also provide losses. So in terms of the
22 various industries we work, what have the largest losses
23 been and how do our limits compare to that.

24 If we're new to an exposure, as we were five
25 years ago in the oil and gas industry, we may conduct a

DERR / HOLLINGSIED

1 special study to help us understand the risks and the
2 claims involved to greater detail. We actually did
3 that, and we called that the Black Swan study.

4 **Q. Thank you. I want to come back to that in a**
5 **minute.**

6 **Are you or will you be currently conducting that**
7 **kind of assessment for the Vancouver Energy Terminal?**

8 A. Yes. We will go through a similar process.
9 Tesoro actually does not use Marsh. There are three
10 primary brokers. They use another broker, so we will
11 actually access their information as well. And I expect
12 that we would perform an additional Black Swan study in
13 terms of terminal operations.

14 **Q. Let's talk about the Black Swan. For those of**
15 **us not in the insurance industry, can you describe what**
16 **a Black Swan analysis is in a bit more detail and what**
17 **that considers?**

18 A. So we were new to the oil and gas industry so we
19 asked Marsh and their actuaries to pull industry losses
20 in terms of the largest worst losses that had occurred
21 and compare that to the limits we carried. What we
22 found were the largest losses were from pipelines,
23 because pipelines can leak for an extended period of
24 time, can release a large amount of material. After
25 this study, we actually increased the limits that we

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1 purchased.

2 **Q. Just a clarifying question, you said you are new**
3 **to the oil and gas industry. Is that today or is that**
4 **referring to when you entered the industry in North**
5 **Dakota?**

6 A. Five years ago, we started with the construction
7 of our Trenton crude oil terminal.

8 **Q. Is that when you conducted the Black Swan**
9 **analysis?**

10 A. We conducted the Black Swan analysis two to
11 three years ago. We did that in response to recent
12 acquisitions that were made; companies that serviced the
13 well head.

14 **Q. So now, referring to an operation similar to the**
15 **Vancouver Energy Terminal where oil will be received by**
16 **rail, will be loaded into storage tanks, loaded on to**
17 **marine vessel, and then shipped downriver to West Coast**
18 **refineries, might there be more than one party and their**
19 **insurance involved if there's an incident?**

20 A. Yes, there could be. So we have coverage at the
21 terminal. In addition, the railroad's policies could
22 respond to an incident, the vessel owner's policies
23 could respond, the owners of the railcar, even the
24 owners of the crude. Depending on the type of claim,
25 manufacturers' or subcontracts' policies could be

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1 invoked as well.

2 **Q. Let's start with the rail.**

3 **Can you generally describe crude oil**
4 **transportation by railroad and what financial assurance**
5 **requirements exist in Washington?**

6 A. So it's my understanding that that's formula
7 based, and the volumes that are carried, the maximum
8 speeds of the train, as well as estimated cleanup costs,
9 are all considered in establishing those limits.

10 **Q. And are those limits established by statute or**
11 **regulation in Washington, do you know?**

12 A. Yes, by statute.

13 **Q. And how about marine vessel; can you generally**
14 **describe how marine vessel crude oil transportation**
15 **financial assurance requirements work in Washington?**

16 A. Washington requires one billion of pollution
17 cleanup liability coverage, which actually is the
18 highest in the nation.

19 **Q. And that's for the marine vessel?**

20 A. For the marine vessel, yes.

21 **Q. Next I want you to focus your attention on the**
22 **facility itself, which is the subject of this**
23 **application.**

24 **Is financial assurances for the facility**
25 **addressed by Washington statute or regulation like the**

DERR / HOLLINGSIED

1 railroad and the marine vessel?

2 A. Well, it's my understanding that ecology has
3 been tasked with setting limits for the facility but
4 this has not been done. The study would consider the
5 reasonable worst-case release, but, in addition,
6 mitigation efforts would be considered in terms of
7 facility design, redundancies, and spill containment,
8 et cetera, but that number has not been established.

9 **Q. So if ecology needs to go through a process to**
10 **establish a number for the facility, what's Vancouver**
11 **Energy's role or response to that?**

12 A. Our response is very supportive. We would
13 conduct a similar study like that ourselves to ensure
14 that we have adequate limits.

15 **Q. So I'd like to ask you a couple questions now**
16 **about your sort of insurance side of that study and what**
17 **you might consider.**

18 **Can you first generally describe the types of**
19 **liability coverages that are available for a facility**
20 **like this?**

21 A. Okay. So in addition to property which cover
22 our facility, the two primary liability policies are a
23 marine general liability policy, and that is broader
24 than a typical general liability policy since it
25 contemplates marine exposures which are typically

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1 excluded under a general liability policy. This policy
2 would respond to third party, bodily injury, property
3 damage, contractual liability, completed operations,
4 advertising liability. But in addition, it would
5 respond to sudden and accidental pollution cleanup. So
6 if there were an event that left the property, this is
7 third-party damage, the policy would respond to that.

8 In addition, we would place a pollution legal
9 liability policy. This also provides coverage for
10 sudden and accidental pollution events, so we would have
11 two policies that would respond to that. But it also
12 provides coverage to our own property, our leased
13 property, and would respond to gradual pollution.

14 **Q. And how do these various types of policies, how**
15 **are they typically combined to cover these types of**
16 **incidents?**

17 A. So I mentioned we would place a marine general
18 liability policy. Typically carriers will only write a
19 policy with 1 million of limits, maybe 5 million, but in
20 marine it's usually 1 million. So we purchase that
21 policy.

22 Then we have to go to other carriers to purchase
23 additional limits. In the marine world, that is called
24 bumbershoot policies. In the U.S., we refer to that as
25 umbrella. Marine is very British and so an umbrella in

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1 the U.K. is a bumbershoot.

2 So we would place additional limits, additional
3 policies above that primary to get to the limits that we
4 need. And as I explained, we would have coverage for
5 sudden and accidental releases on both the marine
6 general liability and the pollution legal liability
7 policy.

8 **Q. I believe the prefiled testimony mentioned**
9 **exclusions to liability policies.**

10 **Do they sometimes include exclusions? And, if**
11 **they do, is it possible to purchase additional**
12 **endorsements to cover those exclusions?**

13 A. So all policies contain exclusions, but for most
14 of them, endorsements can be added to the policy to
15 provide coverage for additional premium.

16 **Q. So let me ask you a couple questions about**
17 **those.**

18 **Can you obtain coverage for domestic and foreign**
19 **terrorism, for example?**

20 A. Yes. Although this might be initially excluded
21 in a policy, by law, carriers have to offer coverage for
22 certified accounts of terrorism. After 9/11 insurance
23 carriers' response was to exclude terrorism because the
24 loss was of such a magnitude that no one anticipated
25 that. So the federal government realized that companies

DERR / HOLLINGSIED

1 need to have coverage for terrorism.

2 So in 2002, the TRIA Act was passed, Terrorism
3 Reinsurance Act, which the federal government expects
4 companies to take a certain amount of the loss, and it's
5 larger depending on the size of the company, but then
6 the federal government actually backstops and pays the
7 additional. So as a result, terrorism has to be offered
8 as part of the quote; doesn't have to be purchased, but
9 it has to be offered.

10 So we would certainly look at that as part of
11 the policies. But London also writes standalone
12 terrorism coverage, so we would certainly explore that
13 as well in terms of coverage, limits and pricing.

14 **Q. How about natural resource damages? Can you**
15 **obtain coverage for that?**

16 A. Yes. That's included on the pollution legal
17 liability policy.

18 **Q. And how about fines and penalties; can you**
19 **obtain coverage for that?**

20 A. That's also included on the pollution legal
21 liability policy.

22 **Q. So you mentioned a few minutes ago that you did**
23 **some review of the coverages in the industry. Are you**
24 **familiar with the insurance limits in the industry for**
25 **similar facilities and operations?**

DERR / HOLLINGSSED

1 A. We asked our broker to provide benchmarking
2 information, what other terminals were buying in terms
3 of limits. And they looked at the oil and gas industry,
4 terminal operators, companies that have tanks onsite,
5 and 29 companies were used in this study, anonymous data
6 so I don't know who they are.

7 But in terms of terminal operations, the limits
8 purchased were between 10 million and 175 million. The
9 largest limits purchased were \$1.2 billion; however,
10 those are large companies, names we would recognize in
11 the oil and gas space. So they do have tanks, they have
12 crude tanks, they have finished product tanks like we
13 had, they have that exposure, but they also have
14 refineries. And they have refineries in multiple
15 locations in the U.S. and possibly worldwide. So the
16 perils that they have to cover are much broader than
17 what we would cover in terms of terminal operations.

18 **Q. At least from an insurance perspective, can you**
19 **explain a little bit more why companies with refining**
20 **operations have higher coverage amounts, higher risk you**
21 **said?**

22 A. So in addition to tanks which they have, there
23 are chemical processes that are involved, there are
24 miles of piping and tubing. They process the crude with
25 heat, extreme heat in pressure vessels. So the risks

DERR / HOLLINGSSED

1 are broader than what is involved with a terminal
2 operation.

3 **Q. How about other states on the West Coast; did**
4 **you review what's required like in Alaska and**
5 **California?**

6 A. Alaska requires 90 million of coverage, and
7 California is a range with the top end being 300 million.

8 **Q. So based on that information that you've just**
9 **summarized, will it be possible in your opinion for the**
10 **joint venture to obtain liability coverage in amounts**
11 **similar to the amounts described above, the benchmark**
12 **amounts or the Alaska and California amounts?**

13 A. Yes. These limits are readily available.

14 **Q. Will the joint venture's assets or net worth**
15 **affect the joint venture's ability to obtain insurance**
16 **in those amounts?**

17 A. What the company cares about is the ability to
18 pay the premium. So if we can pay the premium, then the
19 net assets of the JV are not a consideration.

20 **Q. Will one insurance company typically cover the**
21 **whole amount?**

22 A. No. Insurance companies also intend to limit
23 their risk on any one project or location, and so they
24 will offer blocks of limits. In the U.S. those range
25 from 10 and 50 million that a single carrier would

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1 offer. In Bermuda, higher limits can be obtained, 75 to
2 100 million of limits from a single carrier; however,
3 they like to be high in the tower, above 200 million.

4 **Q. By way of example, does Savage have more than**
5 **one carrier covering its financial liability risks?**

6 A. Yes. In order to obtain our limits, we actually
7 use 15 different insurance carriers.

8 **Q. And I believe, again in the prefilled testimony,**
9 **there was a statement that insurance companies try to**
10 **limit their coverage.**

11 **What you just described, is that what's meant by**
12 **try to limit their coverage?**

13 A. That's my understanding. They limit their
14 coverage by only offering a set amount of limits. Once
15 their policy pays their limits, then they're done and
16 then the next company would step in and offer their
17 limits.

18 **Q. Thank you.**

19 **I'd next like to refer you to Exhibit 1503,**
20 **that's the Abt report and a copy of that is in the**
21 **notebook.**

22 **Do you recall -- and I understand you're not an**
23 **expert in calculating natural resource damages, so I'm**
24 **not going to ask you to evaluate the calculation. I**
25 **just would like to ask you some questions about the**

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1 amounts that they identified, so let's for purposes of
2 your testimony just assume those amounts are correct.

3 And do you recall the dollar amounts that were
4 in their estimates that have not -- you're welcome to
5 report to the to identify those amounts.

6 A. The impact to the fishing industry totaled
7 37 million, the estimate for a worst-case crude spill
8 was 85 million, and the estimate for the worst-case
9 discharge from a vessel was 171 million.

10 **Q. So I want to ask you about the second one, the**
11 **85 million. Was that a worst-case discharge from rail?**

12 A. That was from rail, yes, 85 million.

13 **Q. So were any of the amounts discussed in that**
14 **report worst-case spill events from the facility or from**
15 **the transport?**

16 A. They were from the transport.

17 **Q. If we had a worst-case incident from transport,**
18 **would you expect the rail and marine vessel coverages**
19 **that you described earlier to apply to those incidents?**

20 A. Yes.

21 **Q. If for some reason the rail and marine vessel**
22 **insurance did not adequately cover those incidents, or**
23 **if the Vancouver Energy Terminal owner was somehow also**
24 **responsible for those incidents, in your opinion could**
25 **the joint venture obtain liability coverage for the**

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1 120 to \$200 million worst-case amounts identified in
2 Exhibit 1503?

3 A. Yes.

4 **Q. Would you have any problem obtaining those**
5 **amounts?**

6 A. No. Those are readily available. We could
7 obtain all of that in the U.S. We would not need to
8 access Bermuda or London to do that.

9 **Q. Next I'd like you to refer to the testimony of**
10 **Mr. Blackburn. I believe you testified you reviewed**
11 **that document. There's also a copy in there, although**
12 **we probably won't go to too many pages details.**

13 **Do you recall the liability figure that**
14 **Mr. Blackburn asserts in his prefiled testimony as a**
15 **maximum potential loss?**

16 A. Yes. He references a \$5- to \$6-billion loss.

17 **Q. Do you recall what the basis of that figure was**
18 **in his testimony?**

19 A. He refers to recent media reports of between
20 5 and 6 billion. He references the Lac-Megantic
21 accident at being 3 billion or higher. Other than that,
22 there aren't industry claims that support that number.

23 **Q. Let me ask you first about media reports.**

24 **Are media reports a typical reliable source of**
25 **insurance industry benchmarking?**

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1 A. No. Typically carriers will have information
2 that is closer to the source than media reports.

3 **Q. So have you had some conversations or obtained**
4 **some information about the current estimates for**
5 **Lac-Megantic?**

6 A. So I asked our rail broker, and the rail
7 community I have found is quite small in that brokers
8 and --

9 MS. BRIMMER: Objection. I think he's
10 eliciting hearsay. This is not an expert witness. This
11 is a fact witness.

12 MR. DERR: Your Honor, I'm asking if she's
13 investigated information and response to Mr. Blackburn's
14 testimony about what the insurance industry is learning
15 about this particular issue.

16 MS. BRIMMER: And she is about to report on
17 conversations that she has had with third parties, not
18 specific documents that she has reviewed and can talk
19 about.

20 JUDGE NOBLE: I'll sustain the objection.

21 BY MR. DERR:

22 **Q. Do you know whether more than one party and more**
23 **than one insurance policy was involved in that incident?**

24 A. Yes. Several companies were brought into that
25 suit. Obviously, the short line railroad that caused

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1 the accident was brought into that suit, but in
2 addition, the Class 1 railroad, Canadian Pacific, was
3 brought into the suit, as well as two railcar
4 manufacturers. The lessee and the lessor of the
5 railcars, the owner of the oil at the time, the
6 wholesaler, was brought into the suit. The intended
7 owner, the destination of the oil, was brought into the
8 suit, and the facility that loaded the crude oil in
9 North Dakota were all brought into the suit.

10 **Q. Do you recall whether Mr. Blackburn relied on**
11 **the USDOT, what was called a TIH report for his**
12 **estimate?**

13 A. Yes.

14 **Q. Was that report about crude oil?**

15 A. No, it wasn't. It was a study for the
16 railroads, as they cannot reject any load. They have to
17 move any commodity. And so they were looking at theirs,
18 they termed it nightmare scenario, and what was the
19 worst-case for railroads. And they targeted in on TIH,
20 or toxic inhalation hazard, specifically chlorine
21 anhydrous ammonia. Because of the clouds that are
22 released, the low-lying clouds that can suffocate and
23 kill people, that was their worst-case scenario.
24 Crude-by-rail was not mentioned.

25 **Q. Do you have any experience with obtaining**

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1 insurance for TIH products separate from crude?

2 A. Yes. We have a short line railroad, and every
3 year we have to tell the underwriters how many chlorine
4 cars we move a year. This is viewed as a much higher
5 risk than crude-by-rail. We also move crude cars as
6 well. And the emphasis is on the chlorine exposure.

7 Q. Thank you. Just a couple of wrap-up questions,
8 if I may.

9 Do you expect that the joint venture will be
10 able to obtain performance bonds in the amounts required
11 to cover decommissioning and site restoration costs as
12 described in Mr. Corpron's testimony?

13 A. Yes.

14 Q. Do you expect that the joint venture will be
15 able to obtain one or more insurance policies in amounts
16 sufficient to cover the requirements specified in the
17 Port lease?

18 A. Yes.

19 Q. And will the joint venture be able to obtain one
20 or more policies in amounts sufficient to cover the
21 pollution and liability risks similar to the amounts
22 required by Alaska and California?

23 A. Yes.

24 Q. And how about the amounts estimated in the Abt
25 report which is Exhibit 1503?

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1 A. Yes.

2 Q. And finally, how about the amounts that are
3 consistent with what you described as an insurance
4 industry benchmarks that you described as within the
5 \$10- to \$175 million range?

6 A. Yes.

7 MR. DERR: Thank you. No further questions.

8 JUDGE NOBLE: Cross-examination?

9 CROSS-EXAMINATION

10 BY MS. BRIMMER:

11 Q. Good morning, Ms. Hollingsed.

12 A. Good morning.

13 Q. I'm going to start with trying to sort out a few
14 details with your testimony now.

15 It's my understanding that you're employed with
16 Savage Companies; correct?

17 A. Correct.

18 Q. And can you clarify what your role is with the
19 Vancouver Energy or sometimes referred to as Tesoro
20 Savage during the hearings, the LLC?

21 A. Yes. It's our company that will actually place
22 and manage the insurance policies for the JV.

23 Q. I'm completely unclear on that. Our company?
24 Who is "our"?

25 A. Oh, Savage and my responsibility to place that

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1 coverage.

2 Q. So Savage is buying the coverage for the LLC and
3 Savage's name will be on it?

4 A. Yes, and Tesoro.

5 Q. Okay. So you're not employed by Vancouver
6 Energy?

7 A. No.

8 Q. And when you say the word "we," as you did quite
9 a bit throughout your testimony, are you always
10 referring to Savage when you say "we" or are you
11 sometimes referring to the joint venture LLC?

12 A. I'm referring to Savage. Our team has five
13 individuals, so when I say "we," I supervise all of
14 those activities.

15 Q. And that team are all Savage employees?

16 A. They're all Savage employees, yes.

17 Q. So are you able to actually bind Tesoro to
18 contracts when you're entering into these agreements
19 with insurance companies or on surety bonds or does that
20 require some action by Tesoro as well?

21 A. What we would do is we would recommend an
22 insurance program. I assume that that would be
23 confirmed and blessed by the management committee. But
24 we would make the recommendations as to the coverages
25 and limits that we need to purchase.

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1 Q. So your team makes recommendations to the
2 management committee for the joint venture who then goes
3 back to the two parent companies and the parent
4 companies decide whether or not they're going to go with
5 that recommendation?

6 A. The management committee is made from
7 representatives of both Savage and Tesoro.

8 Q. So does the management committee have final say?
9 Are they able to bind the management -- or excuse me,
10 the parent companies with no additional action by the
11 parent companies?

12 A. Yes. They would have approval for that. Then I
13 would actually bind the policies with the insurance
14 carriers.

15 Q. And you would do that in the names of both
16 Tesoro and Savage?

17 A. Savage and Tesoro would be named on all joint
18 venture policies.

19 Q. Are you involved in preparing any kind of
20 information concerning the assets of any of the three
21 companies -- by that I mean the joint venture LLC,
22 Tesoro or Savage -- for use in determining coverage?
23 Potential liability? Ability to pay?

24 A. No. I am not privy to the financial
25 information. That is not my responsibility. My

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1 responsibility is to make sure that we have coverage
2 adequate to protect the assets of the company.

3 Q. Do you know whether that financial information
4 is, will be or has been supplied to any of the
5 government entities here, whether it's the state or the
6 city?

7 A. I don't know that.

8 Q. I'd like to turn to some of the issues with
9 respect to coverage that you've talked about here. I'm
10 going to start with sort of what is covered in terms of
11 what I might loosely describe as geographic.

12 First of all, to what extent do you anticipate
13 that the insurance that is going to be purchased will
14 cover rail, mishaps or accidents on rail?

15 A. So the insurance that I would place would cover
16 the operations at the terminal. The loading, unloading
17 and storage of the crude terminal. As previously
18 mentioned, the railroads would have their own policies
19 and their own set of limits that could respond to an
20 accident.

21 Q. So we've heard a lot of testimony over the
22 course of two weeks about where the handoff of the oil
23 occurs, and that does actually occur inside the
24 terminal.

25 Is that where the insurance coverage handoff,

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1 for want of a better word, also occurs?

2 A. Yes. So it is important in insurance to
3 understand when our legal liability begins, and there is
4 a clear handoff. Like our terminal in North Dakota, the
5 Class 1 will bring the unit train onto our property.
6 They will get off, we will get on, and then we will pull
7 the unit train through our facility.

8 So at the point that we get on and have care,
9 custody and control of that unit train, that is our
10 responsibility. We will keep that for the unloading and
11 the storage. We will keep that to the point that the
12 crude oil is loaded onto the vessel, to the point that
13 it passes a flange.

14 So the crude oil is our responsibility while it
15 is in our hoses but once it passes the flange of the
16 vessel, it becomes the vessel owner's responsibility.

17 **Q. And I assume -- I was going to ask and you**
18 **anticipated, a similar question with respect to the**
19 **vessel.**

20 So the insurance that you plan to buy will only
21 cover incidents that happen up to that point in the hose
22 where it goes into the ship, and if something happens
23 right at that point, whose coverage applies?

24 A. If it happens right at that point, initially
25 both policies would respond. However, the carriers, the

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1 insurance carriers, would likely discuss that point in
2 who ultimately is responsible. But both policies would
3 respond and provide coverage and defense for the JV and
4 the vessel owner.

5 **Q. But if there's a dispute, I assume everyone**
6 **waits for payment while they figure out who's**
7 **responsible?**

8 A. You know, I'm not sure the order of that. I can
9 tell you we have had a large claim, and there is a
10 dispute as to which insurance policy responds. We have
11 had the carrier pay the full amount and, after the fact,
12 the insurance carriers are in litigation.

13 **Q. Now, with respect to the answers you just gave**
14 **concerning transfers of liability for rail and/or**
15 **vessels, are those answers different if the oil is owned**
16 **by Tesoro? I think Mr. Hack yesterday talked about that**
17 **Tesoro owns the oil from loading in North Dakota all the**
18 **way to wherever the vessel arrives.**

19 A. Typically, responsibility for that oil is the
20 entity that has the care, custody, and control.
21 However, as we saw in Lac-Megantic, the owner of the
22 crude was brought into suit. So in an event of a large
23 release, Tesoro may have liability as being the owner of
24 the crude.

25 **Q. But that's going to have to get sorted out in**

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1 litigation?

2 A. Yes.

3 **Q. I believe Lac-Megantic was summer of 2013;**
4 **correct?**

5 A. I believe so.

6 **Q. And that's still in litigation?**

7 A. Yes.

8 **Q. If there is a spill that reaches the Columbia,**
9 **how far downstream does that coverage reach in terms of**
10 **covering any kind of damage?**

11 A. The marine general liability policy applies for
12 any release off of our property, so there isn't a
13 geographical limitation on coverage. It responds to the
14 entire release, as well as the pollution legal
15 liability. If it leaves our property, the policy will
16 respond to cleanup as well as natural resources damages
17 and fines and penalties.

18 **Q. You referenced, I think, some obligations in the**
19 **lease exhibit about property damage and cleanup. And I**
20 **think you said something about soil. I just want to be**
21 **clear.**

22 On one of the exhibits there was the
23 decommissioning, and that looked like it was a lot of
24 take the buildings down, you know, make the site ready
25 for some other SL Ross tenant potentially.

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1 What happens to the contaminated soil? We're
2 all familiar with Superfund-type sites. What is covered
3 with respect to that type of activity?

4 A. You're correct in that the performance bond only
5 responds to restoring the site to its preconstruction
6 state. In terms of a spill, a gradual release pollution
7 event, the pollution legal liability policy would
8 respond to that, and that is insurance, not a bond.

9 **Q. A spill as opposed to the day-to-day activities**
10 **that are likely to result in some cumulative**
11 **contamination on the site?**

12 A. Yeah. That's called gradual pollution. It
13 would respond to that as well over time, pollution
14 events.

15 **Q. You've referenced a bond for that**
16 **forward-looking obligation as distinct from insurance.**
17 **Is there a surety company that you work with, and who is**
18 **that?**

19 A. Yes. We work with a bonding company. They have
20 faith in our ability to perform, so they charge us a
21 rate, and the rate is the same for all bonds. And it
22 reflects our ability to perform. And our current
23 carrier is Zurich.

24 **Q. Will there be any attempt by Tesoro or the**
25 **LLC -- excuse me, Savage or the LLC to self-bond in any**

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1 of these situations?

2 A. No. I don't believe that would be required or
3 that would be allowed.

4 **Q. Why do you think it wouldn't be allowed?**

5 A. Well, I believe the requirements state that a
6 performance bond or decommissioning bond has to be
7 placed.

8 **Q. So you read that as a third-party bond?**

9 A. Yes.

10 **Q. You also talked about coverage for an incident,**
11 **and I want to explore damage to city property or other**
12 **Port businesses.**

13 **Are those things covered in an incident at the**
14 **terminal?**

15 A. Yes. So that would be covered under our marine
16 general liability so that responds to third-party
17 liability, any damage that we incur off of our site.

18 **Q. What about an incident where, for example, an**
19 **incident drains or contaminates the City water supply or**
20 **wastewater treatment? Would that be covered because the**
21 **City was responding to, for example, a fire incident?**

22 A. Yes. The consequences of a release, if it
23 leaves our property, would be covered by the marine
24 general liability policy as well as the pollution legal
25 liability policy.

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1 **Q. And you've talked about the fact that Savage**
2 **would, in almost every instance, I think you described**
3 **that you would purchase insurance over and above what**
4 **was required.**

5 **Where are you making that commitment where it**
6 **would be enforceable?**

7 **A. The lease requires limits that are quite low, as**
8 **we discussed, 15 million in general liability policy.**
9 **From the research that I've done in terms of other**
10 **terminals are carrying and claims, I don't think that's**
11 **adequate, and I would want to place coverage to**
12 **adequately cover the risks. It's my position, it's my**
13 **job to protect the assets of the JV, and I don't believe**
14 **15 million would do that.**

15 **Q. It's your job to protect the assets of the**
16 **company, but nowhere right now is the obligation to**
17 **carry more coverage than the Port lease requires.**
18 **That's not in writing anywhere.**

19 **Right now it's just your statement of good**
20 **intention; right?**

21 **A. Correct. It's my understanding Ecology will**
22 **recommend limits that need to be carried. We would**
23 **place at a minimum those limits and I assume provide**
24 **evidence that we have done so to the EFSEC council.**

25 **MS. BRIMMER: Thank you. I have nothing**

HOLLINGSSED

1 further.

2 JUDGE NOBLE: Redirect?

3 REDIRECT EXAMINATION

4 BY MR. DERR:

5 Q. I'll just stay here. I only have one question.

6 You were asked some questions about gap where
7 you hand off the railroad and then you hand off to the
8 marine vessel.

9 In your experience, do the policies that apply
10 in that situation where you have potentially three
11 different activities, do they address the handoff points
12 precisely to avoid gaps in coverage?

13 A. It really comes down to care, custody, and
14 control and when the transfer occurred, but between the
15 three policies there would not be a gap. At every
16 point, an entity will have care, custody, and control of
17 that crude oil.

18 MR. DERR: Thank you. No further questions.

19 JUDGE NOBLE: Council questions?

20 Mr. Rossman?

21 MR. ROSSMAN: Thank you for your testimony
22 today.

23 Can you talk a little bit more about the
24 Black Swan analysis that you'll be doing for the
25 Vancouver Energy facility?

HOLLINGSSED

1 THE WITNESS: Right. So Savage performed a
2 Black Swan analysis, and that isn't commonly done, but
3 that was from our conservative approach and
4 understanding the risks. So we actually looked at the
5 Black Swan study in terms of the broad array of oil and
6 gas, but we also looked at rail and transportation since
7 our company does that as well.

8 So it actually looked at the worst losses
9 and it provided confidence intervals in terms of
10 insurance that would need to be covered to contain the
11 worst losses.

12 MR. ROSSMAN: Sorry, this is the study that
13 you did previously?

14 THE WITNESS: Yes, the Black Swan analysis.
15 And it would be my intent that we would update that for
16 the JV and look closer in terms of terminal operators.

17 MR. ROSSMAN: What's the timeline for that
18 work?

19 THE WITNESS: Well, certainly after the
20 permit is received, when construction is being
21 completed, we would then look -- we would complete that
22 analysis before our policies need to be placed, and
23 policies would need to be placed before the facility is
24 operational in terms of the liability and the pollution
25 legal liability policy. So we would do that well before

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1 that.

2 MR. ROSSMAN: When you say "would need to be
3 placed," so is that based on the regulatory requirements
4 or?

5 THE WITNESS: General liability policy
6 covers operations, so once we have operations, we will
7 place those policies. In the example of contractors'
8 pollution, that only applies while we're constructing
9 the facility. Once we're operational, even before
10 testing when we have crude oil volumes onsite, that's
11 when we would bind our pollution legal liability policy.

12 MR. ROSSMAN: Okay. And I think in your
13 testimony you indicated that the parent companies would
14 be named in the insurance policies for the joint
15 venture.

16 THE WITNESS: Yes, both Savage and Tesoro
17 would be named on all joint venture policies.

18 MR. ROSSMAN: Named in what capacity?
19 What's the impact of being named?

20 THE WITNESS: That would provide coverage
21 for the JV itself. So say the JV was named in a suit,
22 the policy responds to that. But if the owners, Savage
23 and Tesoro, were also named, then that policy will
24 insure those names as well and provide defense if
25 they're named in a suit.

HOLLINGSSED

1 MR. ROSSMAN: Got it. So my understanding
2 is that the Vancouver Energy itself may or may not have
3 employees but that portions of the operation will be
4 staffed by Tesoro and other portions by Savage
5 employees.

6 Do you have a sense of whether their actions
7 would be covered primarily -- would Vancouver Energy be
8 liable for their actions or would the parent companies
9 be liable for the actions of their respective employees?

10 THE WITNESS: The joint venture policies
11 would be responsible for both the Savage and Tesoro
12 employees.

13 MR. ROSSMAN: Under what circumstances would
14 Savage or Tesoro be responsible such that that insurance
15 would defend them as well as the joint venture?

16 THE WITNESS: Ultimately, I don't see Savage
17 and Tesoro as responsible, but by it being named on the
18 policy, if they are named in a suit in addition to
19 defending the JV, who is primarily responsible, defense
20 would be provided for the parents as well.

21 MR. ROSSMAN: Would any of -- just speaking
22 to Savage, would any of Savage's other insurance
23 coverage come into play in an incident involving
24 Vancouver Energy?

25 THE WITNESS: No. That is not the intent.

HOLLINGSSED

1 MR. ROSSMAN: Not having seen your Black
2 Swan analysis, I mean, I understand the basic point is
3 to plan for the event that is out of the normal scope of
4 events. And I guess I'm wondering if an event were to
5 occur that were above the levels of insurance that you
6 purchased, whatever they end up happening to be, who
7 would bear the responsibility for those costs?

8 THE WITNESS: Well, insurance policies would
9 respond first, then JV assets. If the claim was similar
10 to the magnitude of Lac-Megantic, then, as discussed,
11 other parties could be brought in to that suit.

12 MR. ROSSMAN: But it's not clear if those
13 parties, such as the parent companies, would have any
14 liability?

15 THE WITNESS: No. No. The intent is that
16 liability from the JV will be included on standalone
17 joint venture policies.

18 MR. ROSSMAN: Can you say a little bit more
19 about that?

20 THE WITNESS: What we would do for this
21 joint venture is place a completely standalone insurance
22 program that would be separate from both Savage and both
23 Tesoro's insurance program.

24 MR. ROSSMAN: Okay. So then the intention
25 of doing that is to isolate this as a different entity

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1 that has its own liability?

2 THE WITNESS: Correct. Since we're partial
3 owners in the joint venture, we don't wholly own this
4 entity, that's why we would place separate policies.

5 MR. ROSSMAN: Okay. No more questions at
6 this time. I might think of a couple more.

7 JUDGE NOBLE: Mr. Moss?

8 MR. MOSS: I just have a couple of
9 clarifying questions, if I may.

10 You talked about bonds and liability
11 insurance at the outset of your testimony, and I wonder
12 if it's appropriate to look at a bond as a limit on
13 performance. In other words, if some event occurs
14 that's covered by the bond and the bond is for
15 \$10 million, and it's going to cost \$20 million or the
16 liability is \$20 million, would the company simply
17 forfeit the bond?

18 THE WITNESS: So in issuing a bond, we are
19 expected to decommission the facility. So it's
20 important that we have correct estimates of
21 decommissioning costs because that is the amount that
22 the bond would be placed in between 15, upper ends of
23 \$20 million. But the idea is we perform, we
24 decommission that. If for some reason we didn't
25 perform, then the Port could call upon the bond and then

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1 they would hire a company to decommission the site. So
2 it doesn't cover liability, it covers our performance.

3 MR. MOSS: Right. And my point is that the
4 extent or the limit on your performance is really
5 defined by the limit of the bond.

6 THE WITNESS: Yes.

7 MR. MOSS: Okay. That's what I'm --

8 THE WITNESS: You know, if it costs more to
9 decommission it, that's our responsibility, our
10 obligation to fully decommission the facility. But the
11 bond amount is set, so only the proceeds of the bond
12 amount can be pulled.

13 MR. MOSS: So then if the costs of
14 decommissioning exceeded the limits of the bond, then
15 presumably the Port might sue you and possibly recover?

16 THE WITNESS: Right.

17 MR. MOSS: Or possibly not.

18 THE WITNESS: Yes.

19 MR. MOSS: Are the bonds only applicable in
20 the context of the decommissioning or are they
21 applicable in the context of some of the other events
22 we've talked about covered by insurance, for example?

23 THE WITNESS: No, they're mostly
24 performance. So we are promising to do an act and they
25 stand behind our promise. And if we don't perform the

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1 act, there are funds that can be used to then hire and
2 then perform the act. So it's covering and responding
3 to a known event where insurance is an unknown
4 possibility that could occur.

5 MR. MOSS: Right. But insurance, also
6 similar to bond, it has limits?

7 THE WITNESS: Yes. Insurance has limits,
8 yes.

9 MR. MOSS: If the casualty loss exceeded the
10 limits of your policy or policies, then any further
11 liability to be borne by the joint venture would
12 probably be determined in court; is that right?

13 THE WITNESS: Yes. The company's assets
14 would respond to an amount over insurance limits. So
15 that's why it's important that we purchase adequate
16 limits to protect the assets of the joint venture.

17 MR. MOSS: Right. Or they may not if they
18 win the lawsuit; is that right?

19 THE WITNESS: The lawsuit in excess?

20 MR. MOSS: Well, is the company going to
21 automatically step up to the plate if the casualty loss
22 exceeds the limits of the insurance policy?

23 THE WITNESS: We run an ethical company, and
24 we certainly would step up to the plate and offer our
25 additional assets above insurance. That's not our

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1 intent. We like to purchase limits that are high enough
2 so we don't have to do that.

3 MR. MOSS: Sure.

4 THE WITNESS: So we fully have transferred
5 the risk. That's our approach. But certainly we would
6 act with integrity and respond to the loss in every way
7 we could.

8 MR. MOSS: All right. I had a conflict in
9 my note taking, and I wanted to see if you can reconcile
10 it for me.

11 I wrote down initially the Department of
12 Ecology will establish insurance requirements and then
13 later you said that the Department of Ecology will
14 recommend an insurance requirement. I wonder which it
15 is.

16 THE WITNESS: I believe by statute that
17 Ecology has been charged with conducting a study to
18 establish those limits as limits have been established
19 for the rail and the marine component as well.

20 MR. MOSS: So you would be required then to
21 have insurance, right?

22 THE WITNESS: Yes. Yes. We would be
23 required to purchase those limits and I assume provide
24 evidence that we have done so to that council.

25 MR. MOSS: Then my last question was another

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1 clarification question.

2 You testified in one response that you would
3 look at, that's a quote, terrorism insurance, and then
4 later you said, quote, explore, closed quote, terrorism
5 insurance.

6 And what I want to know is, does that mean
7 you will look at or explore whether to get it at all or
8 look at and explore which is the best option for getting
9 it?

10 THE WITNESS: Well, at this point, because
11 we don't have a permit and we don't have a facility,
12 we're not done with our due diligence. So we would
13 certainly price, explore terrorism coverage.
14 Ultimately, the management committee would make that
15 decision on whether or not to purchase. We would make a
16 recommendation.

17 MR. MOSS: Thank you.

18 JUDGE NOBLE: Are there any other questions
19 to my left?

20 Mr. Lynch?

21 MR. LYNCH: Good morning.

22 THE WITNESS: Good morning.

23 MR. LYNCH: I was wondering, you mentioned
24 that it's not unusual to have certain types of
25 exclusions in an insurance policy. Would that include

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1 seismic events?

2 THE WITNESS: So in terms of property
3 insurance, as required by contract, we would purchase
4 coverage for the facility that would include the perils
5 normally excluded of earthquake, flood and wind, so we
6 would purchase that, and that is required by contracts
7 so that we could repair or rebuild the facility.

8 In terms of liability, from an earthquake
9 event, our pollution legal liability would respond to
10 that because there isn't a negligence-based standard on
11 that policy. If there is a release, the policy will
12 respond.

13 MR. LYNCH: Are there any types of
14 exclusions that you would anticipate retaining?

15 THE WITNESS: In which policy?

16 MR. LYNCH: Any of them.

17 THE WITNESS: Well, so policies typically
18 exclude three different kinds of things, and the first
19 that we would keep are exclusions against public policy,
20 so fraud, crime, intentional criminal acts. There are
21 some things that are so large the insurance industry
22 can't write. Nuclear risks, those have to be placed
23 with specialty programs. Those are exclusions that we
24 would keep. Asbestos is another example of that. War,
25 civil war, that's too large for the insurance company to

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1 take, so we are forced to take those exclusions.

2 Then there are also types of exclusions on
3 policies that exclude a coverage that is better insured
4 on another type of policy. So the marine general
5 liability will exclude workers' compensation and auto so
6 we will place those kinds of policies, right?

7 But in terms of insuring the exposures that
8 we have, certainly we would buy the additional coverage,
9 so even though the peril might be excluded in the base
10 policy, all others that I haven't mentioned will likely
11 be available for additional premium.

12 MR. LYNCH: I have another question about,
13 you mentioned that certain sorts of consequential
14 damages would be covered under your policies.

15 Does that extend to someone's economic
16 damages? And I'll give you an example. Say there's a
17 release from the facility, it affects some recreational
18 fishing/boating outlets downstream, lose a good number
19 of weeks of their operation.

20 Is that something -- would economic damages
21 to those entities be covered under an insurance policy?

22 THE WITNESS: Yes, they are, as long as you
23 first have a bodily injury or property damage trigger.
24 So you've had an event, and then consequential damages
25 from that event are included. So in your example, the

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1 \$37 million estimate to the fishing economy, that would
2 be included under a policy.

3 MR. LYNCH: Thank you.

4 JUDGE NOBLE: Any other questions to my
5 right?

6 Mr. Snodgrass.

7 MR. SNODGRASS: Mr. Paulson is first.

8 JUDGE NOBLE: I'm sorry.

9 MR. PAULSON: Just a couple questions. Good
10 morning. Thank you for coming.

11 THE WITNESS: Good morning.

12 MR. PAULSON: I'm curious. I know you have
13 insurance and bonds for construction and operations and
14 decommissioning. Does Savage currently insure for
15 transportation?

16 THE WITNESS: We insure for transportation
17 within our business, so we move and manage our
18 customers' critical materials. So we have a lot of
19 trucks and barges and railcars. Our policies do insure
20 all of that transportation of the material.

21 MR. PAULSON: Fine. Including BNSF or Union
22 Pacific or whatever?

23 THE WITNESS: Well, it goes back to the
24 care, custody, and control issue. So if BNSF is moving
25 the product, they have taken care, custody, and control,

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1 and it wouldn't be expected that our policies would
2 respond to that.

3 MR. PAULSON: But I think you were saying
4 you would insure in this case with Vancouver Energy
5 secondary coverage, I assume, for a vessel or railroad
6 coverage or some incident occurring with the railroad or
7 with vessel?

8 THE WITNESS: Our policies wouldn't be
9 expected to respond to a rail or vessel event. Their
10 insurance policies would be expected to respond.

11 MR. PAULSON: Okay. You mentioned also, I
12 think, London coverage. Is that Lloyds of London?

13 THE WITNESS: Yes. So the three primary
14 places to get insurance are U.S., Bermuda, and London.

15 MR. PAULSON: Correct. And that would be,
16 what, umbrella coverage, bumbershoot coverage?

17 THE WITNESS: Yes. Yes. When you're
18 placing coverages in London, you're typically talking
19 about very high limits. They typically don't like to
20 play down low on the primary layers; they typically like
21 to provide the excess coverage.

22 MR. PAULSON: As I recall, Lloyds has some
23 unique systems associated with the coverage. Sometimes
24 it's insurance companies, sometimes it's what they call
25 names or whatever.

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1 THE WITNESS: Syndicates.

2 MR. PAULSON: Yes. Is that the kind of
3 coverage we're talking about?

4 THE WITNESS: In London, most actually of
5 the companies are now corporations, and there are some
6 syndicates where individuals actually stand behind the
7 liabilities. But there is ample liability coverage
8 available in the U.S.

9 As of February of this year, it was
10 estimated that there are \$2.4 billion of liability
11 limits available in the U.S. That does include Bermuda
12 and London, so in the total market a number that big.
13 But I don't see a reason that we would need to access
14 Bermuda and London. I would expect that we would place
15 this coverage entirely in the U.S.

16 MR. PAULSON: There are different standards
17 or rating of insurance companies. Is there a minimum
18 standard that you would require?

19 THE WITNESS: Yes. Since we have
20 15 carriers on our excess limits, it's important that
21 they will be around to respond to a claim. So Marsh
22 actually has a standard where they can only place
23 coverage with carriers rated A minus or better with AM
24 Best, so AM Best is performing the evaluation as to the
25 financial security of the insurance company. And we

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1 would, in this instance, also only place coverage with
2 carriers rated A minus and above.

3 MR. PAULSON: All right. Thank you.

4 JUDGE NOBLE: Mr. Snodgrass?

5 MR. SNODGRASS: Good morning.

6 My question has to do with the insurance
7 climate or the post-Cascadia Subduction event should
8 that occur. I guess what is your -- talk about it in
9 general.

10 I guess is there any industry-wide estimate
11 of total liability within the region from such an event?
12 Obviously that would be kind of a wild guess, but I just
13 wondered what that would be. Go ahead and answer that
14 question.

15 THE WITNESS: This is hearsay. I've heard
16 that it would destroy much of Vancouver. An event like
17 that would be significant.

18 MR. SNODGRASS: Okay. And I guess what that
19 leads to is sort of a question of what confidence do you
20 have that the carriers that you will work with will be
21 able to pay in that kind of a multiple high-dollar claim
22 environment?

23 THE WITNESS: So again, they'll limit their
24 exposure. And carriers actually look at the number of
25 risks they're writing in a certain geographical area and

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1 may choose not to write any more limits in that area
2 because of an event like that, and so many different
3 policies could be invoked.

4 In this case, the policy that would respond
5 to that would only be the pollution legal liability
6 policy since there isn't a negligent standard as is
7 required under the marine general liability policy. So
8 we would place coverage with a pollution legal liability
9 carrier with an AM Best rating A minus and better. And
10 we would expect that they would have the financial
11 wherewithal to pay.

12 MR. SNODGRASS: Thank you.

13 MR. SHAFER: Good morning, Ms. Hollingsed.
14 Thank you for your testimony. I have one question this
15 morning in terms of just actual experience.

16 And my question is, are you aware of any
17 sites or projects where an incident occurred where an
18 event that -- where the actual experience did not go
19 according to plan or where a plan was not sufficient,
20 say due to the magnitude of a fire, explosion, or spill
21 or what have you, or the effects of those things where
22 bonds or insurance was not sufficient, where a local
23 community or a local port may have not been made whole
24 as a result of an incident?

25 THE WITNESS: So the one that comes to mind

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1 is Lac-Megantic. It is undetermined at this time if
2 carriers, the companies and their insurance carriers
3 that are brought into that claim, if they can respond to
4 let's say a loss between 500 million and a billion and a
5 half. It's unclear at this time. Litigation,
6 unfortunately, can take a number of years.

7 MR. SHAFER: Okay. And maybe even in terms
8 of your experience like the proportion that that occurs,
9 what percentage would you say an event occurs, to what
10 percentage is that normally the bonds and insurance
11 found to be sufficient to cover that versus sites where
12 it's been found not to be sufficient? Do you have any
13 kind of a ratio there?

14 THE WITNESS: I don't. I don't know that.

15 MR. SHAFER: Okay. Thank you.

16 JUDGE NOBLE: Thank you, Mr. Shafer. Any
17 other questions?

18 Mr. Siemann?

19 MR. SIEMANN: Good morning.

20 THE WITNESS: Good morning.

21 MR. SIEMANN: If I understood correctly,
22 you've done some analysis of losses or potential losses
23 for facilities of this type -- (Court Reporter
24 interruption.) -- for facilities of this type?

25 THE WITNESS: Yes. I've looked at losses in

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1 the oil and gas industry, including terminal operators.

2 MR. SIEMANN: And what is the sort of
3 largest loss that you've seen thus far?

4 THE WITNESS: Okay. The largest loss to
5 date is -- in the U.S. is 388 million. That came from a
6 terminal that was hit by a hurricane. So that's the
7 largest U.S. loss that we've seen.

8 In terms of worldwide, there is a 2005 claim
9 in the United Kingdom, and that estimate I believe is
10 2 1/2 billion. However, the claim occurred in 2005, so
11 I'm assuming that the facility was not constructed to
12 current standards and there may have been an issue in
13 terms of tank spacing and design and whatnot.

14 MR. SIEMANN: Just out of curiosity, what
15 occurred in that 2005 incident?

16 THE WITNESS: So it wasn't a crude terminal.
17 It was a finished product, a diesel terminal that was
18 holding the finished product. And somehow a fire
19 started, and the facility was surrounded by large trees,
20 and those trees made it so that the fire burned super
21 hot. And my understanding is 20 of the tanks were
22 breached. It was in a populated area, so the impacts of
23 that claim were significant.

24 MR. SIEMANN: And if I understand -- so we
25 talked a little bit about the Black Swan event for this

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1 facility. I didn't quite understand, has one already
2 been done to some degree?

3 THE WITNESS: One was done for our company,
4 Savage, where we looked at our five different industries
5 and had the actuaries provides confidence intervals for
6 the worst-case losses. That was done two to three years
7 ago.

8 My expectation for the joint venture is that
9 we would do a similar study focusing more on terminal
10 operations. We don't need to cover the full breadth of
11 what Savage does.

12 MR. SIEMANN: Can you tell us what the
13 results of that study were?

14 THE WITNESS: Sure. In the midstream space,
15 so oil and gas has upstream, midstream and downstream, a
16 terminal is considered midstream, the actuary found that
17 in order to contain 99.99 percent of the worst claims,
18 limits would need to be obtained in the \$995 million
19 range. But as I discussed when we looked at that, the
20 worst claims that were driving those high numbers were
21 pipeline claims that covered a large geographical area.
22 And we felt as a company we don't have that risk and so
23 we didn't feel that the \$995 million number applied to
24 us.

25 MR. SIEMANN: And do you anticipate that

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1 Vancouver Energy or Tesoro or Savage will self-bond for
2 any of the liabilities that we've discussed today?

3 THE WITNESS: Or self-insure?

4 MR. SIEMANN: Self-insure or self-bond, yes.

5 THE WITNESS: Right. We will likely take a
6 retention, so like on your homeowners you pay the first
7 thousand dollars. We will take a retention that is
8 commensurate to the size of the JV. That might be
9 100,000 when the JV is well in operation, maybe as high
10 as 500,000, so we would be responsible to pay our
11 deductible.

12 However, the insurance carrier is
13 responsible to pay the entire claim if it's a deductible
14 program. They might ask us to post a letter of credit
15 to cover our retention, but ultimately the carrier is
16 responsible to pay the entire claim. So we will take a
17 small portion of the claim. I don't consider that
18 self-insurance.

19 We see self-insurance for companies that are
20 very large. The multi-national companies often insure a
21 significant amount of their business. Or companies that
22 don't understand a risk might be self-insuring a peril
23 just because they're not aware of it. But in this
24 instance, we would not anticipate that we would
25 self-insure the risks.

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1 MR. SIEMANN: You mentioned, if I understood
2 correctly, that the insurance company is responsible for
3 paying the entire claim, but that's up to the limits;
4 correct?

5 THE WITNESS: Up to their limits, yes.

6 MR. SIEMANN: If the claim goes beyond the
7 limits, then what happens?

8 THE WITNESS: If the claim goes beyond the
9 limits, then the assets of the joint venture would
10 respond.

11 MR. SIEMANN: Which would mean that Tesoro
12 and Savage itself would then be liable?

13 THE WITNESS: The assets of the joint
14 venture. So in this instance when the terminal is in
15 operation, the terminal has significant value. That
16 would be an asset of the joint venture.

17 MR. SIEMANN: But wasn't the deductible sort
18 of covered by that also? Is that sort of the beginning
19 and the end, kind of?

20 THE WITNESS: Yeah, I would say the
21 deductibles stand low. That's our portion of the claim
22 that we will pay. And then above the limits that the
23 carriers would provide that we would purchase, then you
24 would consider any amount above that to be
25 self-insurance.

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1 MR. SIEMANN: Okay. And one last question.
2 For the -- totally separate topic, but for
3 the oil owned by Tesoro while in the care and custody of
4 BNSF, as I understand you were talking about just the
5 coverage in the site itself, but there's also this sort
6 of oil that is owned by Tesoro, traveling on trains from
7 North Dakota. Is there coverage for that also?

8 THE WITNESS: Generally, it wouldn't be
9 expected that the owner of the oil would have liability
10 because it's not in their care, custody, or control. So
11 certainly the rail policy would respond to that. The
12 only parallel is Lac-Megantic where the owner of the oil
13 has been brought into the suits.

14 So I would say generally, no, they don't
15 have liability while it's moving unless there's an
16 extraordinary accident that occurred and then they would
17 be brought in to a suit.

18 MR. SIEMANN: Thank you.

19 THE WITNESS: You're welcome.

20 JUDGE NOBLE: Mr. Rossman, did you have?

21 MR. ROSSMAN: I do have a couple more
22 questions.

23 Thinking about the sort of looking at other
24 claims, my understanding this is going to be the largest
25 oil terminal of this nature in the United States and so,

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1 I guess, how do you think about that when you're looking
2 at claims that have occurred for smaller facilities?

3 THE WITNESS: We would like to understand
4 the claims and the size of the facility they're coming
5 from. In all instances, we won't be able to get that
6 information, because when Marsh provides benchmarking
7 information they're providing information on other
8 clients who want to keep their information confidential.
9 So I probably won't be able to benchmark in terms of
10 facility size when I look at claims.

11 MR. ROSSMAN: Got it. And turning to the --
12 I'm forgetting the name of it, but the study in
13 Exhibit 1503, the Abt study that had those liability
14 figures. If you're able to turn to what is marked as
15 Page 13 of the exhibit, but which is page I guess S-8 of
16 the report, there's a paragraph in there, and I don't
17 fully understand the paragraph, but in the middle of the
18 page right before the end it says, "Summarizing data
19 from multiple incidents, the range of damages from other
20 oil spill incidents scaled by the volume of oil spilled
21 in the Columbia River scenarios is \$232 million to
22 1.16 billion for the tanker grounding, and \$224 [sic]
23 million to \$122 million for the train derailment."

24 Do you see that paragraph?

25 THE WITNESS: Yes.

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1 MR. ROSSMAN: And I recognize your point
2 about you wouldn't expect the terminal's coverage to
3 address transportation, but I guess in the event of a
4 large seismic event that resulted in a release of
5 similar magnitude from the terminal, your insurance
6 would cover that; is that right?

7 THE WITNESS: The pollution legal liability
8 policy would respond up to our limits.

9 MR. ROSSMAN: Up to the limits.

10 THE WITNESS: Right.

11 MR. ROSSMAN: So I guess it seems from this
12 and from the pipeline number that you gave that there's
13 a possibility of liability in the range of a billion
14 dollars from an extreme unprecedented event.

15 THE WITNESS: Well, from our standpoint, we
16 have known quantities, where the pipeline can spill
17 enormous amount of quantities that can go undetected for
18 days. So in our instance, we have a finite amount of
19 crude oil onsite. And then understanding our
20 containment, the design of the facility, the
21 redundancies in spill containment, I don't see where a
22 pipeline claim is applicable to our perils at the
23 facility.

24 MR. ROSSMAN: So by implication, that would
25 suggest like the volume of oil in the pipeline claim was

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1 much more than the volume of oil stored at this
2 facility.

3 THE WITNESS: I would assume so, yes.

4 MR. ROSSMAN: Got it.

5 So turning to something you said in response
6 to Chair Lynch's question, that we're "an ethical
7 company." That was referring to Savage?

8 THE WITNESS: Savage, and standing behind
9 our obligations and what we say we're going to do. I
10 would assume we would take the same approach with the
11 joint venture, that we would operate with integrity and
12 understand our responsibility to the community and third
13 parties.

14 MR. ROSSMAN: Do you have a sense of what
15 assets the joint venture will own that could be accessed
16 in the event that an incident would be on the insurance
17 coverage?

18 THE WITNESS: I can speak generally.
19 Definitely the terminal itself is a significant asset
20 and very strategic to both Tesoro and Savage. So that's
21 the primary asset. But then once the facility is
22 operational, there will be a revenue stream that would
23 increase the value of the joint venture.

24 MR. ROSSMAN: And the terminal is presumably
25 going to have large construction costs. Do you know if

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1 that's going to -- if there's going to be net asset
2 value there or if there are going to be obligations
3 against it?

4 THE WITNESS: I don't know that. I think
5 others could answer that question.

6 MR. ROSSMAN: Okay. I guess I'm wondering
7 how as a Savage employee you see this corporate
8 structure as living up to Savage's ethical perspective
9 on meeting its commitment to its neighbors in the
10 community.

11 THE WITNESS: I am not privy to the
12 corporate structure, how it's designed. That's beyond
13 my responsibilities. My responsibility is to protect
14 the assets so the JV assets are invoked. I think others
15 could speak to that.

16 MR. ROSSMAN: In your position as risk
17 management for Savage, is a part of that risk management
18 part of this corporate structure?

19 THE WITNESS: I would anticipate we take the
20 similar approach, be very conservative in the limits
21 that we purchase, understand what the perils are, what
22 the claims and purchase limits that are sufficient
23 enough to ensure against most perils. That would be my
24 approach and that's what I would recommend to the
25 management community.

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1 MR. ROSSMAN: In terms of your
2 responsibilities to Savage, you think Savage's interests
3 are protected equally well by forming this joint
4 enterprise which will purchase this insurance or if
5 Savage had done the enterprise itself and purchased its
6 own insurance, those are equivalent in your mind from a
7 risk management perspective?

8 THE WITNESS: From an equivalent approach?

9 MR. ROSSMAN: In terms of protecting
10 Savage's interests from a risk management perspective.

11 THE WITNESS: In both cases, I would want to
12 make sure our insurance limits are adequate to cover
13 perils.

14 MR. ROSSMAN: It seems to me in the one case
15 the assets of Savage could be at risk and in the other
16 case they wouldn't be.

17 THE WITNESS: That may be correct. But I
18 think others could answer that question definitively.

19 MR. ROSSMAN: Okay. Thank you.

20 JUDGE NOBLE: Any other council questions?
21 I have a couple of questions.

22 Going back to -- first of all, would you
23 tell me so that I understand the meaning of
24 "beneficiary" in the insurance industry?

25 THE WITNESS: That applies to bonds, so it's

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1 a performance guarantee. So the beneficiary is the
2 entity that wants the act performed. So in this case,
3 the beneficiary would be the Port of Vancouver. They
4 want their land restored to preconstruction size. They
5 would be the beneficiary that would receive the funds to
6 complete the activities if Savage did not perform.

7 JUDGE NOBLE: And is it your testimony that
8 there are no bond products that are available to cover
9 pollution cleanup?

10 THE WITNESS: No. No. That would be
11 covered in the insurance market.

12 JUDGE NOBLE: And with regard to the
13 insurance market, you said in your testimony that you
14 did not see the companies, Tesoro and Savage, as
15 responsible, but insurance would provide a defense.

16 Now, I am relating that to your subsequent
17 testimony that the insurance would first cover an
18 incident for the joint venture up to its policy limits
19 and then the joint venture's assets would cover.

20 THE WITNESS: Right.

21 JUDGE NOBLE: Beyond that, the parent
22 companies would have a defense provided to them, but
23 they would not be liable in any way for any of the
24 damages?

25 THE WITNESS: That speaks to corporate

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1 structure, and again, I haven't seen that. I'm not
2 aware of that. But I think others could answer that
3 question.

4 JUDGE NOBLE: Well, you said that you were
5 purchasing completely standalone insurance program. So
6 could you explain in that context of the corporate
7 structure what that means?

8 THE WITNESS: Right. Because we don't own a
9 majority of the joint venture, our policy wouldn't
10 respond to the joint venture's activities. It is
11 possible to get coverage for a joint venture on a
12 policy, but typically you have to own the larger
13 majority to get coverage on our policies. So as a
14 result, in order to cover the joint venture itself,
15 that's why we would place a standalone insurance program
16 from a casualty standpoint.

17 JUDGE NOBLE: So in your understanding of
18 things, only the joint venture's assets would be
19 vulnerable to liability for some kind of damage,
20 pollution or otherwise?

21 THE WITNESS: Again, if there are
22 indemnification provisions in a contract, I'm not aware
23 of that, so I just don't know. I don't know that.

24 JUDGE NOBLE: All right. And so if it
25 should happen that -- well, let me just ask you this.

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1 You said that you had studied the
2 Lac-Megantic situation. And are you aware that the
3 railroad in that case immediately filed for bankruptcy
4 protection?

5 THE WITNESS: Yes. They only carried
6 25 million of limits which, when the carrier realized
7 what happened, they gave their limits and they were done
8 with their piece of the claim. Yes, I am aware of that.

9 JUDGE NOBLE: So it's your understanding
10 that should the joint venture -- and I don't mean to ask
11 you to make a legal conclusion, but the way that the
12 insurance is structured with a standalone insurance
13 program, the joint venture, Tesoro Savage, is the entity
14 that's responsible for incidents that occur, and then
15 only when it has care and custody at the Port?

16 THE WITNESS: Right. Once the product is in
17 our care, custody, and control, that's when our policies
18 would respond to that.

19 JUDGE NOBLE: And its ability to pay for any
20 incidents is limited by, A, the insurance limits, and
21 its assets after that.

22 THE WITNESS: I believe that is the case.
23 But again, others can speak to the corporate structure
24 and indemnification agreements.

25 JUDGE NOBLE: All right. Just I think my

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1 final question is, you said that your responsibility is
2 to make sure that the insurance is adequate to protect
3 the company, and by that you are talking about only the
4 joint venture?

5 THE WITNESS: Correct.

6 JUDGE NOBLE: All right. Thank you.

7 Any questions based upon council questions?

8 MS. BRIMMER: Yes. Thank you.

9 RECROSS-EXAMINATION

10 BY MS. BRIMMER:

11 Q. I'm going to begin with some questions asked by
12 Council Member Rossman about the Black Swan study. And
13 I want to clarify, that study, the original one that you
14 were referencing that was done by Savage, that was
15 before Lac-Megantic; correct?

16 A. Lac-Megantic occurred in 2003.

17 Q. No, 2013.

18 A. I'm sorry, 2013, right.

19 You know, it may have just happened, but
20 estimates from that claim I'm sure weren't developed
21 enough to include that in the analysis.

22 Q. You're sure they were developed enough?

23 A. No, they were not.

24 Q. Right.

25 A. Not enough was known about that claim to

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1 understand the magnitude of it.

2 **Q. Will you include that and factor that into the**
3 **update you say you're doing on the Black Swan?**

4 A. What I would expect that Black Swan study would
5 look at terminal operations, and the operations that
6 we're liable for. We aren't liable for the movement of
7 that crude; the railroad's policy would respond. So I
8 don't see that that claim would be applicable to
9 terminal operations.

10 **Q. So you think that Lac-Megantic is not relevant**
11 **to the consideration of financial assurance in this**
12 **case?**

13 A. Certainly there needs to be financial insurance
14 that would respond to a claim like that, but that would
15 be the railroad's responsibility.

16 **Q. And I think it was your testimony or your**
17 **understanding that part of the problem with Lac-Megantic**
18 **is that the railroad wasn't able to cover all of the**
19 **damages?**

20 MR. DERR: Objection. I believe that
21 mischaracterizes her testimony.

22 BY MS. BRIMMER:

23 **Q. You can correct me if I did.**

24 **JUDGE NOBLE: There's been an objection.**
25 **Are you withdrawing the question?**

BRIMMER / HOLLINGSSED

1 MS. BRIMMER: No. She can tell me if I
2 misstated her testimony.

3 JUDGE NOBLE: All right. Did you understand
4 the question?

5 THE WITNESS: Can you restate that?

6 BY MS. BRIMMER:

7 Q. It was my understanding that your testimony is
8 that in the Lac-Megantic case, one of the problems is
9 that the railroad did not have adequate coverage for the
10 incident.

11 JUDGE NOBLE: Now, let me just -- did you
12 understand the question and does it misstate your
13 testimony?

14 THE WITNESS: I would agree that the short
15 line railroad --

16 JUDGE NOBLE: Just -- I have to rule on this
17 objection.

18 THE WITNESS: Oh, okay.

19 JUDGE NOBLE: Did you understand the
20 question?

21 THE WITNESS: Yes. Yes.

22 JUDGE NOBLE: And does it misstate your
23 testimony?

24 THE WITNESS: That the limits were
25 inadequate for the accident? Yes, I'll agree with that.

BRIMMER / HOLLINGSSED

1 JUDGE NOBLE: All right. I'll overrule the
2 objection. I think the witness has answered it already.

3 THE WITNESS: That's true.

4 MR. DERR: That's okay. We wish to be
5 forthcoming even if she's not allowed to testify about
6 Lac-Megantic. (Laughter.)

7 THE WITNESS: To support that, we have a
8 short line railroad. We certainly don't carry
9 25 million in limits based on what we're carrying.

10 BY MS. BRIMMER:

11 Q. So I'd also like to follow up on questions that
12 were asked by a number of council members, I think
13 Council Member Rossman had some and perhaps Council
14 Member Siemann, about corporate structure.

15 So first of all, let's be really clear.
16 Throughout your testimony you have used the acronym
17 "JV." I think what you're saying is joint venture. I
18 think what you really mean is the limited liability
19 company that is Vancouver Energy; is that correct?

20 A. Yes. Vancouver Energy, yes.

21 Q. I just wanted to make sure.

22 And I think that you've also stated that all of
23 the insurance coverage and the bonding that we've been
24 talking about today will be held in the name of the
25 limited liability company; correct?

BRIMMER / HOLLINGSSED

1 A. Correct.

2 Q. And it will cover the acts and issues associated
3 with the limited liability company?

4 A. Right, the activities of the limited liability
5 company.

6 Q. And to the extent that Tesoro or Savage parent
7 companies are named or covered at all, it is only to the
8 extent that they are determined liable; correct?

9 A. Correct.

10 Q. And the point of the limited liability company
11 is to in fact shield those parents from liability
12 associated with the terminal; correct?

13 A. Again, I'm not privy to the corporate structure.
14 I can't answer that, as I don't fully know or understand
15 that.

16 Q. Do you understand general corporate structure
17 and the point of a limited liability company?

18 A. Yes, in terms of limited liability company is
19 intended to stand on its own.

20 Q. Intended to stand on its own and to limit
21 liability; correct?

22 A. It depends on the contract, indemnification
23 behind that. But without that, yes.

24 Q. You've talked about the assets of the limited
25 liability company coming into play should insurance

BRIMMER / HOLLINGSSED

1 coverage or bonding be inadequate. And I think you
2 talked about the terminal.

3 The limited liability company does not own the
4 terminal; correct?

5 A. The limited liability owns the improvements
6 onsite. There's a long-term lease for the land, but the
7 facility itself will be owned by the joint venture.
8 That's why a reclamation bond is required, so in the
9 event operations were to cease, it would be our
10 responsible to restore that land to preconstruction
11 state.

12 **Q. So right now the primary asset of the limited**
13 **liability company is the lease with the Port; correct?**

14 A. Yes. Right now there are very few assets.

15 **Q. So you said that if you build things like**
16 **buildings or tanks on the site, those will be assets of**
17 **the limited liability company?**

18 A. Yes.

19 **Q. And I assume those will be encumbered by whoever**
20 **your lender is?**

21 A. I'm not sure the financing of the joint venture.
22 I don't know if a lender is required.

23 **Q. But at some point there's going to be a bunch of**
24 **used tanks in buildings that maybe someone could sell**
25 **off to pay a debt?**

BRIMMER / HOLLINGSSED

1 A. Yes. Yes.

2 **Q. Nothing else, though, right?**

3 A. The facility, yes. And then retained earnings
4 in the joint venture. So as the joint venture is
5 operational, the revenue streams would certainly
6 contribute to the value of that joint venture. But in
7 terms of hard, tangible assets, yes, we're talking about
8 the facility.

9 **Q. And presumably, if there's a major event at the**
10 **facility, whether it's seismic or even something not**
11 **quite as catastrophic as seismic, there's not going to**
12 **be a revenue stream; right?**

13 A. Correct. A property policy will pay to repair
14 or rebuild a facility. And actually, you can purchase,
15 from our standpoint, whether it's called business
16 interruption coverage that would cover the lost earning
17 streams while the facility is being repaired.

18 **Q. For the company, but not for the damage caused**
19 **by the event?**

20 A. Right, would cover our lost profits and
21 continuing expenses as the joint venture.

22 **Q. You talked about, in response to some questions**
23 **from Council Member Lynch, fishing and lost revenues.**

24 **Do you anticipate that the insurance policies**
25 **will cover other damage to fishing interests such as the**

BRIMMER / HOLLINGSSED

1 tribe's cultural interest?

2 A. Insurance responds to a financial loss. If you
3 can quantify that, which I think would be very difficult
4 to quantify cultural impacts, there would be coverage.
5 But it has to be a financial loss that can be quantified
6 in terms of dollars.

7 Q. In reference to some questions from Council
8 Member Siemann concerning the Black Swan study, you seem
9 to be emphasizing that pipelines would result in -- and
10 please correct me if I'm mischaracterizing, I'm trying
11 to summarize my notes -- the pipelines were more likely
12 to result in worst damage and so you felt that those
13 weren't much of a comparison for the terminal's
14 potential liability.

15 Is that accurate?

16 A. Yes. And particularly these pipelines were
17 long, as I understand, longer distance pipelines
18 covering a wider geographic area than our facility.

19 Q. So a hole in a pipeline in a farmer's field is
20 worse than a spill in the Columbia River or a
21 Lac-Megantic-type incident?

22 A. I wouldn't necessarily say that. It depends on
23 the quantity and the impacts from a spill.

24 Q. Uh-huh. So I just want to be understanding what
25 you consider relevant or appropriate for comparison in a

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1 Black Swan update.

2 Pipelines are very different so you don't
3 consider them particularly useful for the terminal. The
4 Lac-Megantic incident is not particularly useful for
5 comparison to the terminal.

6 Is that correct? Is that your testimony?

7 A. Correct. I'd want to look at other terminal
8 operators and losses that they have had, since the
9 intention of our policy, it would respond to those kinds
10 of claims.

11 MS. BRIMMER: I have nothing further.

12 JUDGE NOBLE: Any other questions based upon
13 council questions from Opponent's side? Mr. Derr?

14 REDIRECT EXAMINATION

15 BY MR. DERR:

16 Q. You were asked questions by council I believe
17 about the railroad in Lac-Megantic. And you mentioned
18 that they only carried 25 million.

19 Am I remembering that correctly?

20 A. The short line railroad.

21 Q. Do you have any information about BNSF, which is
22 the railroad that will be transporting oil to this
23 facility, do you have any information as to whether
24 their ability to cover an incident is different than the
25 short line?

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1 A. Yes. My understanding is railroads carry closer
2 to a billion dollars in coverage. Our railroad brokers
3 feel that there's a billion and a half of capacity in
4 the railroad market as a whole.

5 **Q. Thank you.**

6 **Judge Noble asked you a question about the**
7 **beneficiary for the bond.**

8 **Is that better?**

9 **Judge Noble asked you a question about the**
10 **beneficiary for the bond, and you mentioned it could be**
11 **the Port of Vancouver. Was that based on the provisions**
12 **in the lease?**

13 A. Yes. The Port is requiring that a bond be taken
14 out for decommissioning.

15 **Q. And if, for example, on this project, if EFSEC**
16 **were also to have an obligation to make sure the site**
17 **were decommissioned upon completion, could EFSEC also be**
18 **the beneficiary of a bond for decommissioning?**

19 A. Yes. A bond could be taken out on EFSEC's
20 behalf, yes.

21 **Q. Thank you.**

22 **And the last, I believe, question I want to ask,**
23 **Mr. Rossman asked you questions about the size of this**
24 **facility and I think he asked you if this was the**
25 **largest facility in the country.**

1 **Just to clarify, is this the largest facility**
2 **that stores crude oil or transfers crude oil or is it**
3 **the largest crude-by-rail facility in the U.S.?**

4 A. You know, I don't know that.

5 **Q. Do you know if there are larger oil storage**
6 **facilities elsewhere in the country, say in the Gulf?**

7 A. I don't know that.

8 MR. DERR: Thank you. No further questions.

9 JUDGE NOBLE: Thank you.

10 Ms. Hollingsed, you are excused as a
11 witness. Thank you very much for your testimony here
12 this morning.

13 THE WITNESS: Thank you.

14 JUDGE NOBLE: This is a good time to take
15 our morning break, I think, and it's currently 10:43.
16 So if you would return at 10:55. Thank you. We're off
17 the record.

18 (Recess taken from 10:43 a.m. to 11:00 a.m.)

19 JUDGE NOBLE: Back on the record.

20 Mr. Kisielius, could you call your first
21 witness, please.

22 MR. KISIELIUS: Yes. The applicant would
23 like to call Dr. Elliott Taylor.

24 JUDGE NOBLE: Mr. Taylor, would you raise
25 your right hand, please.

1 **referring to today so you can refer to those as needed.**

2 **Can you briefly describe what you have reviewed**
3 **in preparation for your testimony?**

4 A. Certainly. I've reviewed a lot of the
5 application materials, particularly those parts of the
6 application materials that have to do with spill
7 response and preparedness, so the spill contingency
8 plan, for instance, operations manual, booming
9 threshold, SPCC plan. Those aspects.

10 **Q. Okay.**

11 A. I've reviewed some testimony as well that
12 related to that subject matter, and I also participated
13 in the tabletop exercise in January of this year,
14 looking at the spill response for a presumed worst-case
15 scenario.

16 **Q. Okay. And we'll talk about all those aspects in**
17 **just a little bit. I'd like to start with just an**
18 **overview and some background.**

19 **What is your understanding of the oils that the**
20 **facility will handle from the standpoint of API gravity?**

21 A. It's my understanding that the API gravity range
22 is 15 to 40, 45 API.

23 **Q. Okay. And there's a lot of testimony about**
24 **diluted bitumen, dilbits, and Bakken. Can you describe**
25 **where those fall on that range, please?**

1 A. Certainly. The dilbits are sort of towards the
2 low end of the API range, so they'll typically come in
3 around 18 API. There's some products, depending on what
4 the oil sand products are, would be 15 and then the
5 Bakken is on the upper end of the API range, so they're
6 typically up around the 40 mark, a little bit less,
7 maybe a little bit over.

8 **Q. Okay. And can you remind us just a little bit**
9 **more about what dilbits are beyond the API gravity?**

10 A. It's one of the oil sand products that's
11 exported. It's a blend of a diluent. It looks like a
12 condensate, for instance, with bitumen, which is
13 extracted from oil sands. And so those two products are
14 blended to form a new material, new hydrocarbon, which
15 is then transportable, has a lower viscosity and so you
16 can put it in pipes, pump it, put it in railcars or
17 pipelines.

18 **Q. Okay. There's also a lot of testimony about**
19 **sunken or submerged oils. Can you describe what those**
20 **terms mean to you?**

21 A. Yeah. When we talk about sunken and submerged
22 oils, really what we try to very clearly clarify the
23 difference between the two. Submerged oil means it's
24 somewhere within the water column, so the natural
25 turbulence and motion that the water would have can

1 incorporate some oil into the water column. That would
2 be submerged oil. Sunken oil is oil that has settled
3 out of the water column, so it's sitting on the bottom.

4 **Q. And in your opinion, is it appropriate to call**
5 **any of the oils within the API range that we've**
6 **discussed, that 15 through 45 range, is it appropriate**
7 **to call any of those sunken or submerged oils?**

8 A. No. You wouldn't use those terms to refer to a
9 specific oil. The oil behavior is what you would refer
10 to when you talk about submerged or sunken oil. But the
11 range of oils that we're talking about, 15 to 45 API,
12 those are all lighter than water. An API 10 is the same
13 as fresh water, and so because they're 15 and up to 45,
14 those are all lighter than water, so those oils are
15 going to float.

16 **Q. Let's talk a little bit about the behavior that**
17 **you just referenced. And I want to start with dilbit,**
18 **sort of the lower end of the range that you just**
19 **described.**

20 **How does dilbit behave when spilled into water?**

21 A. Well, it, like most oils, the first thing that
22 will happen is that it'll start to spread across a water
23 surface. Spreading is the first process that takes
24 place. You also start to get evaporation that happens,
25 so some of the lighter ends are starting to evaporate

1 off, and if there's any movement on the water then that
2 oil would be translated or moved with the currents or
3 winds or conditions like that. So those are sort of the
4 very first processes that happened with a dilbit on
5 water.

6 **Q. I was going to ask you a question about**
7 **Ms. Susan Harvey's testimony. Did you review that one**
8 **specifically?**

9 A. Yes, I did.

10 **Q. She said that the light ends of dilbit will**
11 **evaporate leaving the very dense portions to sink and**
12 **make them difficult to recover.**

13 **So is that true?**

14 A. Certainly light ends of a dilbit will evaporate
15 off, just like as with any oil. If you have the light
16 ends, there's going to be a certain amount of
17 evaporation. And then the oil that remains increases in
18 density.

19 But what we've found from experiments that we
20 did, for instance, at Gainford and experiments that have
21 been done in flume tanks both in Canada both by SL Ross
22 and then some -- (Court Reporter interruption.) SL Ross,
23 and by some of the tests by CRREL with SL Ross, and
24 actually where dilbits were actually put on water, those
25 studies showed that the dilbit remained floating on the

1 water surface for days and days. There were only one or
2 two products that after days and days of weathering
3 there was some submergence observed, so not syncing but
4 submergence.

5 MR. KISIELIUS: And for the council's
6 benefit, those studies that Dr. Taylor just referenced
7 are exhibits in the record at 275.

8 BY MR. KISIELIUS:

9 Q. Actually, Dr. Taylor, if you could look at
10 starting at Tab 17, just to confirm. The exhibit number
11 is identified in the bottom right-hand corner.

12 A. Yes. One of the ones that I referred to is
13 Tab 19, so it's 236, and another one is Tab 22, which is
14 275, and Tab 23, which is 276.

15 Q. Okay. You just described the evaporation
16 process. What would actually cause them to sink?

17 A. In order to sink dilbit, or for that matter any
18 number of petroleum products that are floating on water,
19 there's a couple of things. One, you would have to
20 reduce or increase the density through that evaporative
21 loss to a point where the residue exceeds fresh water
22 density. And as I mentioned in the tests that were
23 done, we didn't see that actually happen except in one
24 or two cases in which it reached one and submerged but
25 didn't sink.

1 To actually sink it, usually with the dilbits,
2 for instance, you have to invoke another process which
3 is sediment interaction. You have to get the dilbit to
4 disperse, form droplets, and have those droplets
5 interact with sediment. And then because sediment is
6 heavier than water, once it attaches to an oil droplet
7 it can submerge. And if you get into quiet conditions
8 where there's not much flow and there's not much
9 turbulence and that can possibly settle out.

10 **Q. And so does that process you just described,**
11 **that sediment load, I think you said, does that vary by**
12 **water body?**

13 A. It would vary by water body because you need a
14 sediment load. First of all, you need to provide a fair
15 amount of sediment to do that, and then you also have to
16 have that turbulent motion to form that interaction.

17 One of the studies that was done recently looked
18 at the Fraser River, for instance, and the suspended
19 sediment in the Fraser River and the energy level in the
20 Fraser River has potential for forming for what is
21 called oil particulate aggregates or OPAs. And that
22 particular study, for instance, found that there was
23 sediment load which is on the order of 200 milligrams
24 per liter, which is insufficient to form OPA, the oil
25 sediment aggregates, in the Fraser. And the typical

1 sediment loads in the Columbia River are lower. They're
2 on the order of 50 to 80 milligrams per liter.

3 **Q. I'd ask you to turn to Tab 18 in your binder.**
4 **If you can confirm that was the study. We're looking at**
5 **Exhibit 235.**

6 A. Yes. And this particular study, this is one
7 that the government in Canada did. And in here they
8 describe, for instance, an oil sediment interaction
9 using dilbit.

10 And in that case, they put dilbit into
11 cylinders, graduated cylinders with suspended sediment
12 loads that were on the order of 10,000 grams per liter.
13 So this is somewhere over 200 times the amount of
14 sediment that you would expect, for instance, in the
15 Columbia River. Extremely high sediment loads. It
16 doesn't happen even on the Fraser River or other places.
17 So it was abnormally high. But under those
18 circumstances on the fresh diluted bitumen, dilbit, they
19 did observe some sedimentation, not so much with the
20 weathered.

21 **Q. Okay. So you had mentioned the sediment**
22 **conditions. Were there other factors that lead to this**
23 **sedimentation attaching of the hydrocarbon to the**
24 **sediment?**

25 A. Again, it's an energy. It's exposure of oil

1 droplets or oil to sediment itself. If a spill, for
2 instance, reaches a shoreline and there's energy mixing
3 that oil with materials from the shoreline, sand or
4 something like that, then some oil could deposit out as
5 well.

6 And in that regard, I mean, it's no different,
7 dilbit is -- you know, that some portion of dilbit might
8 sink is no different than other crude oils or other oils
9 that would have that interaction at the shoreline.

10 **Q. Just to be clear, you said a portion. Does the**
11 **process that you're describing, does it affect all of**
12 **the spilled oil when it occurs?**

13 A. No. First of all, you have to have the right
14 conditions, as I was explaining, both in energy level
15 and sediment level, and then even under those
16 conditions, you're only talking about a small portion.
17 The vast majority of that dilbit will remain floating on
18 the surface.

19 **Q. Okay. Let's focus on that portion that would be**
20 **subject to that process. What happens to it?**

21 A. Subject to which process?

22 **Q. The sedimentation.**

23 A. Okay. If there is sedimentation, and so some
24 portion of a spill were to interact with the sediment,
25 then as I mentioned earlier, once that flows into an

1 area where you have less turbulence, less motion, that
2 can maintain that sediment and oil particulates
3 suspended, then they may settle out.

4 Then also, interestingly enough, it has that
5 natural process of sediment and oil aggregation also
6 results in a somewhat naturally dispersed oil within the
7 water column that is also subject biodegradation.

8 **Q. I heard you say a couple times "like other oil**
9 **products" when talking about dilbit.**

10 **When you're looking at these types of**
11 **phenomenon, does dilbit present any unknown challenges**
12 **as compared to other oils, in your opinion?**

13 A. No. I mean the range of oils that we -- that we
14 talked about in from the 15 to 45 API range, I mean,
15 those are encompassed by-products that are moved every
16 day up and down the Columbia River. I mean, asphalts,
17 for instance, are lower. Bunkers are right in that same
18 range as the dilbits. On the high end, you have refined
19 products.

20 So there's a lot of oil and there's a lot of
21 range. And then the ones that are being handled at the
22 terminal or proposed for handling at the terminal fall
23 within the range of other products.

24 **Q. Okay. Now, we were focused a little bit on**
25 **dilbit. I want to go to the other end of the spectrum**

1 **and talk about the lighter end. I think you were**
2 **talking about, for example, Bakken crude oil.**

3 **How would Bakken behave if spilled into the**
4 **river?**

5 A. Well, same thing as dilbit. The first thing
6 that's going to happen is it's going to spread along the
7 surface, and then you're going to start to have some
8 evaporation. If you have currents or movement and
9 winds, then you start to see it transported by those
10 processes.

11 There will be, just like with dilbit, there may
12 be a portion that's dispersed, although there's a
13 greater amount that would be naturally dispersed from
14 Bakken relative to dilbit just because of the much lower
15 viscosity. There's going to be a greater amount that
16 evaporates off of Bakken relative to what evaporates off
17 of a dilbit.

18 But in general, the processes are similar; just
19 some are -- can take you further down the weathering
20 range with the Bakken.

21 Q. I just want to clarify something, because when
22 we were talking about dilbit and the evaporation and the
23 weathering that occurs there, if Bakken is more likely
24 to evaporate or there's more evaporation, I think is
25 what you said, is it any more likely, what's left

1 **behind, any more likely to sink?**

2 A. Well, you're going to have more loss through
3 evaporation with the Bakken relative to the evaporative
4 loss from the dilbit. As with any oil, as you lose the
5 light ends, what remains -- (Court Reporter
6 interruption.) Light ends, sorry. And then as the oil
7 that remains, of course, has the higher density and a
8 higher viscosity.

9 Bakkens don't have the extent, the same quantity
10 of some of the heavier end oils, the longer chain
11 hydrocarbons. And so when you lose that evaporative
12 loss and the residue from Bakken, it's still relatively
13 lower viscosity. But if you put that lower viscosity
14 residue up against the shoreline and interact with the
15 shoreline, for instance, and have the mixing with a lot
16 of the sediment, then yes, you could see some of that
17 forming an oil particulate aggregate.

18 **Q. Okay. But that would be subject to the same**
19 **process that you described, the sedimentation and the --**

20 A. Correct.

21 **Q. You had earlier described a portion for dilbit**
22 **that that process of sedimentation and the submerging of**
23 **portions of it applies to a portion of the oil spilled.**

24 **Is it the same for Bakken? In other words, what**
25 **amount of the oil spilled would be subject to those**

1 **processes and become submerged?**

2 A. Again, it's very, very case specific and it very
3 much depends on that having the right combination of
4 factors in a specific location. As I said, in general,
5 the sediment loads and energy level that we have in
6 general on the Fraser are not going to be conducive to
7 either one really having much syncing.

8 **Q. I just want to clarify. You said the Fraser.**

9 A. I'm sorry. Along the Columbia River. Thank
10 you.

11 But it would be mostly, if it does occur, it
12 would be through that process right at the shoreline
13 more than anything else, and then it would be very small
14 quantities or relative to the rest of the oil volume.

15 **Q. I want to ask you the same question I asked
16 about the lower end of the range.**

17 **Does Bakken or the lighter end of that range
18 that we're talking about present any unknown challenges
19 when we're talking about spill and recovery as compared
20 to other oils?**

21 A. No. Again, it falls within the range of a lot
22 of products that are handled up and down the river. So
23 it's characteristics are well known and it presents
24 nothing unusual in that regard.

25 **Q. Okay. Let's talk a little bit more about --**

1 we're talking about weathering and what happens when
2 it's spilled. I want to talk about modeling that's done
3 to analyze that effect.

4 In your experience, what are the two types of
5 things that models typically explore?

6 A. Well, typically you're going to look at a couple
7 of aspects. One is how does oil change through time,
8 through natural processes. And so some of the modeling
9 tools are the weathering tools that tell you how much
10 you might expect would evaporate, how the remaining oil
11 density might change and the viscosity might change and
12 if it emulsifies. So that's the one sort of area of
13 modeling that's typically done.

14 And the other area is really looking at
15 trajectories. How is it moving? If you can define
16 winds and current conditions, then it gives you an idea
17 of how that oil may be transported.

18 Q. So I want to talk about both of those. First
19 let's talk about that weathering model.

20 Did you complete a weathering model?

21 A. Yeah. We ran the NOAA ADIOS model, which is the
22 standard that's used on spills and for a lot of planning
23 purposes. So you can put in the type of oil, you can
24 put in the quantities and then environmental conditions,
25 and it will provide you with results on evaporation and

1 all the weathering processes and changes in oil
2 character.

3 **Q. Okay. And did you have to make assumptions**
4 **about the API gravity for purposes of that model?**

5 A. Well, the model, the NOAA library has hundreds
6 of different oils in it and amongst the oils that are in
7 there, there's a cold lake dilbit -- (Court Reporter
8 interruption.) Cold lake dilbit, which is what we used
9 when we did -- well, both in my written testimony and
10 then we also used it for the spill exercise. So that
11 was one that was in there, and it already had the
12 predefined oil characteristics including the API
13 gravity. And, similarly, there's a Bakken crude within
14 the library that we used both in my written testimony
15 and for the spill exercise.

16 **Q. And when you run this weathering model, do you**
17 **assume any recovery measures are in place?**

18 A. The weathering model is -- no. When we ran it
19 here and generally when people run it, the idea is to,
20 what's going to happen with this oil in general? You
21 could run it to assume containment and recovery, but the
22 runs that we've done and the other results that are
23 explored in the application don't assume any sort of
24 intervention. It's just the oil is undergoing this
25 natural process.

1 **Q. So what did that particular model show you?**

2 A. Well, the main thing is that with the dilbit
3 that you can expect sort of under average conditions
4 that we ran, for instance, on -- here on the Columbia
5 River somewhere on the order of 23 percent evaporative
6 loss. And then with Bakken, you can expect somewhere
7 closer to 50 percent evaporative loss.

8 And you have increases in density, but in the
9 case of the dilbit density increase never reaches one,
10 so it doesn't reach fresh water. It's always lighter
11 than fresh water.

12 **Q. How does a facility use modeling like this?**

13 **Does it affect spill planning and preparedness?**

14 A. It certainly helps with spill planning and
15 preparedness. It helps to understand the behavior, how
16 the oil will weather and the changes of the oil through
17 time.

18 So, for instance, with dilbit, the evaporative
19 loss leads to a more viscous oil. And so you may change
20 your skimmers, for instance. You may use one set of
21 skimmers when it's still fresh, and then as it weathers,
22 you may switch over to different types of skimmers. So
23 it helps in that context of defining some of the assets
24 you might use.

25 **Q. Okay. Let's switch to the other type of**

1 modeling. We talked about the weathering one. I think
2 the other one you mentioned is a trajectory analysis.

3 Did you conduct a trajectory analysis?

4 A. No, I didn't do a trajectory analysis myself.

5 Q. Did you review the one that was part of the
6 application?

7 A. Yes. I looked at two trajectory analysis, both
8 in application materials.

9 Q. So -- well, why don't you describe either one of
10 them?

11 A. Well, the one that's in the oil spill
12 contingency plan, for instance, is a trajectory analysis
13 that we also used when we did the spill exercise in
14 January, and that is -- it varies straightforward simple
15 model of advancing oil down the river with the current.

16 So there is a -- it basically provides you with
17 a timeline of how far that leading edge of the oil has
18 advanced at 2, 4, 6, 12 hours, 48 hours. So in that
19 regard you have an idea of when you might see oil
20 reaching a particular location.

21 Q. And similar question to the one I asked about
22 the earlier model.

23 Does that model assume any recovery or
24 containment?

25 A. No. Same thing, it's just letting the oil

1 travel with the current and giving you a progression
2 downriver.

3 **Q. So what's the value of that study? How does it**
4 **help in the planning process?**

5 A. More than anything else it gives you an idea of
6 sort of your timeline. Let's say you wanted to notify a
7 downstream user that has a water intake. Then you know,
8 for instance, okay, well, at somewhere around maybe six
9 hours there's a chance that a leading edge could reach
10 that location. So you'd want to make sure that you've
11 given them notification well before that happens.

12 Or if you're protecting a sensitive area, for
13 instance, you would want to have boom deployed in those
14 areas prior to that leading edge. So in that regard it
15 helps you with planning a succession of response
16 strategies through time.

17 **Q. You've described a different trajectory analysis**
18 **other than that one?**

19 A. Correct.

20 **Q. Can you tell me about what that is?**

21 A. Yeah. That's the trajectory analysis that was
22 done actually for Ecology. That was the RPS ASA study
23 that was done, which is a stochastic trajectory
24 analysis -- (Court Reporter interruption.) Stochastic
25 trajectory analysis.

1 **Q. What is a stochastic trajectory analysis?**

2 A. So that type of analysis takes a spill event and
3 then it moves it with the currents and it allows the
4 spreading and evaporation to happen, and it looks at the
5 same sort of thing that the previous trajectory analysis
6 does, and looks at how that oil might advance down the
7 river and spread on the river. But it doesn't look at
8 one spill as an example.

9 It actually runs, in the case of that particular
10 model, 100 spills and it stacks all of those spills on
11 top of each other. And so when it runs the 100 spills,
12 it's sampling different environmental conditions,
13 different currents, speeds, different weather from the
14 historical records. And so when it stacks all those
15 100 spills, it gives you an indication of probability,
16 where is it more probable that oil might travel on the
17 river.

18 And so from a planning purpose you can -- it
19 helps you to focus in on what areas may be at more risk
20 from the spill. But because it stacks 100, it doesn't
21 represent a single spill. It's actually that sum of
22 spills.

23 **Q. So when Ms. Harvey on Page 21 talks about this**
24 **model and suggests that it shows oiling of the entire**
25 **river, is that an accurate characterization of that**

1 **particular trajectory analysis?**

2 A. No. No. I mean, if you look at the figures,
3 the graphics, that's showing you the stacked sum. So
4 you're seeing what looks like a lot of oil but then,
5 again, that is a sum of a lot of spills and it's really
6 probability is what you should be thinking in terms of
7 the spill.

8 And in practical and actual experience, the
9 spills don't just go bank to bank and cover every mile
10 of river up and down. I mean the currents will really
11 carry the oil and confine it or tend to create areas
12 where you have concentrated oil and wind droves, or you
13 may have oil that's stranded on the shoreline.

14 So there's a lot of complicating factors. That
15 was just a very broad, broad generalization and it
16 really doesn't represent what would happen.

17 **Q. Okay. So let me ask you, in having looked at**
18 **the weathering modeling and the trajectory analysis,**
19 **what does that show you about the crude oils that we're**
20 **talking about here? Are there any surprises in terms of**
21 **the way they might behave if spilled?**

22 A. No. Again, the weathering behavior is pretty
23 well known at this stage in time for the products
24 that -- within that API range. Practical experience,
25 there's practical experience with oils within that range

1 and the trajectory analysis is really reflecting what we
2 all know, and that is generally oil is going to move
3 downriver.

4 **Q. Okay. I'd like to talk about planning**
5 **documents. I'm using that as an understanding of the**
6 **behavior of the oil. Let's talk about planning for**
7 **spill response.**

8 **Can you just remind us of your specific**
9 **experience with oil spill planning?**

10 A. Yeah. I've been doing -- I've been a part of
11 developing spill plans ever since OPA 90 came out, and
12 so both across the country in the U.S. as well as
13 internationally I've been very involved in spill
14 planning. And as a matter of fact, just recently helped
15 with the preparation of best practice for spill
16 contingency planning both for the International Maritime
17 Organization as well as the OGPI PICA group, and I've
18 been involved in over a hundred spill contingency plans.

19 **Q. Can you tell us, there's been testimony about**
20 **the spill planning documents that have been prepared, so**
21 **I just want to start just with an overview without**
22 **getting into a lot of the details about the spill**
23 **planning documents that have been prepared for this**
24 **proposed facility.**

25 A. Okay.

1 **Q. Can you just describe what those are?**

2 A. Yeah. At a very high level, you have an oil
3 spill contingency plan for operations, so once the
4 facility becomes operational how you would deal with
5 spills. There's a contingency plan for during
6 construction. There's an SPCC plan, Spill Prevention
7 and Countermeasures Plan. There's the Oil Transfer
8 Operations Manual, and then a lot of related appendices
9 to those.

10 **Q. Okay. And if you need to, copies of those**
11 **documents are in the binders there.**

12 MR. KISIELIUS: And for the council's
13 benefit, the spill contingency plan, all of these are in
14 Exhibit 1, attachments to the application for site
15 certification. The contingency plan starts at
16 Page 2561, the oil handling manual starts at 2993, and
17 the SPCC starts at 2475.

18 Again, I don't necessarily think we need to
19 pull those up, but if we do, we'll call out specific
20 pages.

21 BY MR. KISIELIUS:

22 **Q. I know your testimony covers the overarching**
23 **regulatory framework that sits behind these documents**
24 **and so I don't necessarily want to go over that again in**
25 **detail.**

1 **But as we're talking specifically about**
2 **Washington regulations and requirements, based on your**
3 **experience with planning, how would you describe**
4 **Washington's requirements as compared to the rest of the**
5 **country and the rest of the world?**

6 A. Well, I would say that Washington has what I
7 would consider some of the most stringent requirements,
8 some of the most defined requirements both from a
9 planning perspective as well as from a preparedness and
10 equipment level perspective. It's one of the top
11 regulatory environments that we work in, in terms of
12 spill preparedness and prevention and contingency
13 planning in the U.S., and the U.S. is certainly a leader
14 worldwide in this subject.

15 **Q. And I should ask, did you have an opportunity to**
16 **review the plans that you had described that were**
17 **prepared for this facility?**

18 A. Yes, I did.

19 **Q. Okay. There's a topic that was discussed by**
20 **Mr. Eric Haugstad at the preliminary nature of the oil**
21 **spill contingency plan.**

22 **Do you agree with that characterization? Is the**
23 **oil spill contingency plan preliminary?**

24 A. Well, considering that there's no facility,
25 considering that this is an application, there's

1 certainly a place for putting together a spill
2 contingency plan and certainly concepts. I think the
3 level of detail that's in here is remarkable, in my
4 experience, at this early stage of a process to have
5 this level of detail in terms of spill contingency plan.

6 **Q. And would you expect that document to be updated**
7 **prior to commencing operations?**

8 A. Absolutely. I think it would be updated prior
9 to operations, and as with any oil spill contingency
10 plan, it would be updated as exercised and as any
11 changes, appropriate changes happen, it would trigger
12 updates.

13 **Q. Okay. Going back to your testimony about the**
14 **behavior of the range of crude oils the facility could**
15 **handle and the analyses of that range, are there**
16 **response strategies, known response strategies to**
17 **address spills of any of the types of oils that fall**
18 **within that 15 to 45 range?**

19 A. Yeah, the response strategies are defined in the
20 plan. Because as I mentioned earlier, the primary
21 response is going to be if this oil, first of all, if it
22 reaches water, it's going to be basically floating. And
23 so, as with other oils, we're looking at containment,
24 booming, skimming operations as defined in the
25 contingency plan.

1 **Q. I want to ask you about a detail in that plan.**
2 **Ms. Harvey points to the plan to suggest that only**
3 **10 percent of the oil from a worst-case spill would be**
4 **recovered in the event of a spill.**

5 **Is that an accurate characterization of the**
6 **amount that could be recovered in a spill from the**
7 **facility?**

8 **A. I would say that that's a broad generalization**
9 **that I wouldn't adopt myself. The countermeasures that**
10 **are in place, whether that be prebooming or the response**
11 **strategy as defined immediately for the facility and**
12 **immediately downstream of the facility in GRPs, mean**
13 **that there's going to be very quickly a lot of**
14 **opportunities to trap and contain and collect the oil if**
15 **it were to reach water. And our experience has shown is**
16 **that the sooner you can have containment in place the**
17 **more effective your actual recovery is going to be.**

18 **So you can have extremely high recovery rates**
19 **and have containment in place, and then likewise, the**
20 **sooner it goes in, the higher the recovery rate. So**
21 **10 percent is a very low number for something that has**
22 **equipment either predeployed or ready to be deployed.**

23 **Q. And are you familiar with what that 10 percent**
24 **figure comes from? What's the basis of it?**

25 **A. That was really, more than anything else, it was**

1 looking at storage capability for the waste stream that
2 would come out of the spill response.

3 Q. So let's talk about another criticism. I think
4 Ms. Harvey says that the response actions in the plan
5 couldn't be implemented quickly enough to prevent oil
6 spreading and contamination.

7 Do you agree with that statement?

8 A. No. Again, depending on what the particular
9 details are of a spill, I mean, you could have a
10 situation where you have predeployed boom so if you had
11 a spill, for instance, at a point in transfer over
12 water, then with boom in place it's already contained.
13 That's the objective.

14 Q. And so in your opinion, does the spill plan for
15 the terminal meet the requirements and standards based
16 on the information about the facility that is known to
17 date?

18 A. Yes.

19 Q. And would the response measure specifically be
20 sufficient to mitigate the risks of a spill from the
21 facility?

22 A. I think so.

23 Q. I want to focus a little bit on sunken or
24 submerged -- strategies to address sunken or submerged
25 oils. I think Ms. Harvey says those don't exist or

1 **those are unknown.**

2 **Do you agree with that?**

3 A. No, I would not agree with that. We have --
4 there's been many cases of spills in which either some
5 or a major portion of oil ends up sinking. And again,
6 in this particular case, if -- if anything did happen,
7 it's only going to be a small portion.

8 But there is experience with handling submerged
9 and sunken oils, and as a matter of fact, two of the
10 exhibits in the binder here speak to that, both API
11 reports on detection and delineation and recovery of
12 sunken oil, submerged and sunken oil.

13 MR. KISIELIUS: For the council's benefit,
14 those are Exhibits 258 and 259.

15 BY MR. KISIELIUS:

16 Q. I want to talk about an element of the plans,
17 prebooming and booming as a response measure more
18 generally. Ms. Harvey mentions throughout her testimony
19 that booming is going to be impossible or ineffective,
20 so I want to kind of pull that apart a little bit.

21 First, I think she refers to the facility
22 implementing partial prebooming. So what is partial
23 prebooming?

24 A. Partial prebooming is deploying boom that
25 doesn't necessarily completely close or encircle a

1 vessel, for instance. So on a river, for instance, you
2 would have a boom around the downstream end of the
3 vessel and up the length of the vessel, but perhaps not
4 closed at the very top where the current is entering.
5 That would be a partial prebooming.

6 **Q. And when prebooming, is that -- when the**
7 **facility would preboom, is that your understanding of**
8 **the technique they would employ?**

9 A. No. My understanding here is that full
10 prebooming would take place, so the vessel would be
11 encircled in boom.

12 **Q. Okay. The crux of the issue, I think, is the**
13 **ability to utilize that technique, the prebooming**
14 **technique. I know Mr. Haugstad has testified to this,**
15 **but what is your understanding of the limits on the**
16 **ability to preboom?**

17 A. One of the things that is required with Ecology
18 in the transfer process is to establish what are deemed
19 safe and effective thresholds for prebooming; that is,
20 under what conditions would you be able to preboom but
21 also identify under what conditions it may not be safe
22 for the personnel that are doing the deployment or safe
23 for the equipment, or it's going to be ineffective for
24 the equipment in terms of having that deployed ahead of
25 time.

1 In this particular case, currents in excess of
2 1 1/2 knots, high wind speeds I think on the order of
3 30, sustained winds of about 30 knots, or severe chop
4 exceeding 2 1/2 feet would be conditions which would be
5 deemed either unsafe to put the equipment out and likely
6 to be ineffective.

7 **Q. So if one of those thresholds, let's take**
8 **currents, for example, if they're higher than**
9 **1 1/2 knots, you wouldn't preboom. Would it still be**
10 **possible to conduct transfer operations?**

11 A. Yes. I mean, the regulations require that you
12 would preboom for transfers as long as you're within the
13 thresholds. It doesn't mean that you cannot conduct
14 operations. It just means you would need to undertake
15 alternative safety measures at the time of the transfer.

16 **Q. So in your opinion is prebooming an essential**
17 **response strategy?**

18 A. It's one response strategy, but there's a whole
19 series of strategies that would ensue should a spill
20 happen.

21 **Q. And again, if you could, in that instance, if**
22 **you can, if it's not safe or effective to preboom and**
23 **you conduct transfer operations, what's your**
24 **understanding of what ensues from a regulatory**
25 **standpoint?**

1 A. Well, first of all, you would notify Ecology.
2 So they get a notification that you're still will
3 undertake transfer operations, and you also let them
4 know what the conditions are. The conditions also
5 certainly can't exceed the unsafe conditions that are
6 already defined for the project, so there's going to be
7 an upper limit where transfers won't happen.

8 But within the range, within the operational
9 restrictions, then you would -- you could carry on
10 transfers, but, for instance, at the facility they would
11 have a boat in the water. They would have boom at the
12 dock ready to be deployed, just not actually
13 predeployed. And then, for instance, some of the other
14 requirements such as maybe having tracking system to
15 track oil were it to spill under, say, low visibility
16 conditions.

17 **Q. In your experience, is it uncommon for**
18 **facilities like this to exceed a safe and effective**
19 **threshold -- have a condition exceed the safe and**
20 **effective threshold, but still conduct transloading**
21 **operations?**

22 A. Yes. I mean, the terminals in Washington state,
23 they certainly preboom as long as it's in those ranges,
24 but the transfer operations will continue even though
25 you may have conditions that they exceed the safe and

1 effective threshold, yes.

2 Q. So you defined this or described it before. I
3 want to return to that. You said there's an upper
4 limit.

5 What's your understanding of the upper limit in
6 this instance and what's the document that establishes
7 that?

8 A. Yeah. There's the document which is the
9 operational restrictions, and I think it's Appendix L,
10 it's called Unsafe Operating Conditions. And it
11 establishes, for instance, if you have sustained winds
12 of 30 knots and above, you will not be conducting
13 transfer operations. If you have unsafe conditions from
14 other perspectives, say very cold temperatures and
15 adverse conditions for worker health and safety, then
16 you would not conduct transfer operations.

17 Q. Let's go back to the question of how often you
18 might be in that position where conditions are such that
19 you can't meet the safe and effective threshold. I
20 think Ms. Harvey testified that that would be the case a
21 significant portion of the time.

22 How regularly do you think those conditions
23 would be satisfied based on your understanding of river
24 currents, for example?

25 A. My understanding is that most of the time you

1 would be able to conduct safe and effective booming, the
2 prebooming. The river currents range. There's a range
3 of currents and it very much depends on where you are in
4 the river when you look at current speeds. Typically
5 along the river banks you have slower speeds. And in
6 looking at the NOAA information and USGS discharge
7 information and some of the results that are presented
8 in the application materials, I think we're looking at
9 most of the time average river conditions would allow
10 prebooming.

11 MR. KISIELIUS: Ms. Mastro, I'm going to ask
12 you to please pull up Page 2712 of Exhibit 1.

13 BY MR. KISIELIUS:

14 Q. And while we're waiting for that, Dr. Taylor --
15 there we go. Can you tell us what we're looking at
16 here? If you want to look at the one on your page, you
17 can do that as well.

18 A. This is a summary on a monthly basis of the
19 conditions on the Lower Columbia River. So on the left
20 you have temperature, visibility, precip, wind,
21 daylight, and currents. And then you're provided with
22 the average of those on a monthly basis throughout the
23 year. So, for instance, for currents, you can see that
24 it ranges from -- the average ranges from .8 to .9.

25 Q. And I understand that's an average?

1 A. Correct.

2 **Q. But can you describe whether average or**
3 **otherwise, whether the current conditions that are**
4 **reported are what you'd -- are representative of what**
5 **you'd expect closer to the shore?**

6 A. Again, these are all based on discharge, and so
7 that is an average for the river. I would expect
8 generally lower currents at a longer shoreline than in
9 midstream. So within this average, midstream may be
10 faster and along the banks it may be slower.

11 **Q. Waves was another parameter that you mentioned**
12 **in the safe and effective threshold. In your opinion**
13 **how do waves affect the ability to preboom?**

14 A. The main issue with waves is the steepness of
15 the wave, the chop. If you have a rolling wave, a boom
16 will just glide over it, and so it's still very
17 effective with just kind of a gentle wave. And that
18 could be a tall wave. Just if it's a roller, then the
19 boom will float over it.

20 The real issue is when you end up with chop and
21 a lot of splashover. So a boom can be less effective
22 because you get this sort of lifting effect from the
23 chop and can spill oil over the top of the boom.

24 **Q. So let's go back to what we were talking about**
25 **when you actually do exceed the -- the conditions exceed**

1 **what's allowed under the safe and effective threshold.**

2 **Can you describe in just a little more detail**
3 **what other types of response strategies you have at your**
4 **disposal?**

5 A. Yeah. Well, the other response strategies are
6 additional containment. I mean, with a spill that
7 reaches water, of course the driving factor is to get
8 containment around that spill.

9 So in addition to what you would have deployed,
10 if you were able to safe and effectively to have
11 predeployed boom, you've got containment, but then you
12 would very typically put in additional containment
13 lines. So any oil that for one reason or another might
14 be escaping your initial primary containment, you have
15 backup lines to contain that, and then to redirect it or
16 concentrate it for recovery using pumps or skimmers.

17 So those are clear strategies that go to initial
18 containment and recovery. There's also strategies as
19 defined in the Northwest area plan all the way down the
20 Columbia River. Notifications, protection strategies,
21 other points that are used for collection and recovery.
22 So those would also be implemented.

23 **Q. Okay. And are you familiar with the Current**
24 **Buster boom? Again, Mr. Haugstad testified to that a**
25 **couple days ago.**

1 A. Yes.

2 **Q. Is that a technique or a method that would be**
3 **available in higher currents?**

4 A. Yeah. Current Buster, it's a tool that's been
5 developed. It was developed in the last ten years or
6 decade pretty much out of Norway. And it's designed to
7 be much more effective under faster current conditions
8 or faster towing. And so that -- Current Buster, my
9 understanding, is available to the facility, and it
10 provides yet another tool to work at either a fast tow
11 rate or in conditions where you have faster currents.

12 **Q. Okay. And what's your understanding of the**
13 **speed of the current in which it could be used?**

14 A. Well, like any boom, you can use it at any
15 current speed. If you have severe turbulence, that's
16 where a boom is not going to be effective. But if it's
17 just current speed, current flow, you can arrange boom
18 to work under a range of current speeds.

19 Current Buster itself, for instance, if you just
20 put it straight in a test like they did at Ohmsett,
21 where they tested the boom, they were running one of the
22 Current Buster models up to 5 knots. But a lot of it
23 has to do with the configuration of the boom and how
24 it's used relative to the speed of the current.

25 **Q. I think Mr. Haugstad used a term, "chasing the**

1 **current." Is that -- are you familiar with that**
2 **technique?**

3 A. Yes. So let's say you don't want to exceed 2 or
4 3 knots with your boom. And so if the current is moving
5 at 1 knot, then you would not want to be advancing up
6 into the current faster than 2 knots, for instance. So
7 that you would stay within that range. If the current
8 is moving at 3 knots, I can hold stationary and I would
9 still have 3 knots at the current. If it's going at
10 4 knots, I can turn around and start going with the
11 current in advance on the oil. So that's booming
12 downstream.

13 **Q. Okay. Ms. Harvey says that there aren't**
14 **specific strategies for response in fast water or strong**
15 **currents.**

16 **Do you agree with that statement?**

17 A. No. There's lots of strategies for faster
18 currents and conditions. There's a guide that was put
19 together by Region 3 that is specific on that very
20 topic.

21 **Q. How long does it take to deploy a boom?**

22 A. It can be very, very quick. You know, if you
23 have boom on a reel, for instance, at the dock you can
24 typically have hundreds of feet of boom out within
25 literally minutes. So a lot of it just depends on the

1 location of the boom and obviously a boat in the water.

2 Q. So, again, Ms. Harvey references a scenario in
3 which booming would not be provided until five hours
4 after the spill.

5 Is that an accurate characterization for
6 deployments of response measures?

7 A. No, not at all.

8 Q. Could skimmers that you described, could those
9 be deployed before a large amount of oil moves
10 downstream?

11 A. Certainly, same thing. If you've got your
12 skimmer at the dock, once you put the boom in and you
13 start to have containment, you would be able to drop the
14 skimmer in the apex and start recovering the oil. Very
15 quick.

16 Q. I know we've been focused a bit because of the
17 prebooming focus on onsite resources. I want to talk a
18 little bit about offsite resources.

19 So the offsite resources we've defined, are
20 those the full extent of the response resources that
21 could be brought to bear in the event of a facility
22 spill?

23 A. No. That's your first line, what you have at
24 the facility itself and on the dock. Those are going to
25 be your immediate deployment pieces of equipment and

1 assets. But the facility has, as indicated in its plan
2 and as we saw during the spill exercise, contracts with
3 the spill response community here, Clean Rivers, MSRC
4 and others in that network to bring a tremendous amount
5 of equipment and personnel to bear on a spill response.

6 MR. KISIELIUS: Your Honor, I'm going to
7 pause for just a second. I'm prepared to keep going.
8 I've got another 20, 25 minutes' worth of questions to
9 go and I can proceed. I just observed the time and want
10 to make sure before I switch to another topic.

11 JUDGE NOBLE: Thank you for that. I was
12 thinking that you were maybe almost done, but I'm wrong.
13 So I do appreciate --

14 MR. KISIELIUS: Sorry.

15 JUDGE NOBLE: That's all right. I just was
16 guessing.

17 So I think this would be then a good time to
18 stop for the lunch break. So we'll be off the record
19 until 1:00.

20 (Lunch break.)

21 JUDGE NOBLE: We are back on the record.

22 Mr. Kisielius, would you continue your
23 examination of Mr. Taylor?

24 MR. KISIELIUS: Yes, Your Honor.

25 BY MR. KISIELIUS:

1 **Q. Dr. Taylor, when we left, we were starting to**
2 **talk about the resources available beyond those that are**
3 **onsite. So to that end I guess I'd ask you to describe,**
4 **I'll start with the question where I left off.**

5 **Are the onsite resources the total amount of**
6 **resources that can be brought to bear in a spill from**
7 **the facility?**

8 **A. No. That's your initial response, but there's a**
9 **tremendous amount of other resources that would be**
10 **brought to bear through the contractual arrangements**
11 **that the facility would have with the responders.**

12 **Q. And can you describe that a little bit, how that**
13 **operates in practice?**

14 **A. Certainly. It really is part of the spill**
15 **contingency plan. You've identified contractors with**
16 **the levels of response capabilities in the area to meet**
17 **the Washington state planning standards. Those**
18 **standards are very specific about the amount of**
19 **different types of equipment that should be available**
20 **within specific time frames, a 2 hours, 6 hours,**
21 **12 hours, et cetera, there should be a certain amount of**
22 **equipment available to respond to a worst-case spill.**
23 **So those quantities are assets that your spill response**
24 **contractors basically would have.**

25 **Q. Let me ask about those response contractors.**

1 **How do we know they're capable of responding to**
2 **a spill? How do you verify that?**

3 A. Well, first of all, they have to be registered
4 with the state. They're primary response contractors,
5 so they have a very clear mission mandate. They have a
6 very transparent list of resources and equipment that's
7 available, that's publicly available on the Internet.
8 You can look at the equipment that each one of these has
9 where it's prestaged. And then they're required to go
10 through a whole series of annual inspections and
11 exercises.

12 **Q. And when you say "exercises," are they running**
13 **tests? Drills?**

14 A. Yeah. They'll participate sometimes with a
15 company that has them under contract for a spill
16 exercise, so they'll mobilize -- they can do an exercise
17 that's a tabletop so you do on paper exercise of where
18 equipment comes from and the time it takes to get from
19 its staged equipment location to a spill site. There's
20 other deployment exercises where you actually put
21 equipment out. Very often, those are done to
22 specifically test GRPs that are already identified up
23 and down the river.

24 **Q. And so you just described some drills, tabletop**
25 **drills. I want to ask, there's been some discussion of**

1 a tabletop drill. You mentioned one at the outset.

2 So can you describe the tabletop drill that you
3 completed for the facility?

4 A. Certainly. So in January of this year, we got
5 together with personnel from Tesoro's facility and their
6 contractors, which their Clean Rivers Co-Op, MSRC to sit
7 down and go through the process of what are the steps
8 that would have to take place for a worst-case spill
9 exercise.

10 So there's an assumption that the largest tank
11 is full to capacity and it ruptures and for some reason
12 it all goes straight into the river. And that's just
13 one of the requirements that Ecology has and EPA as for
14 defining a worst-case spill.

15 But then it really is an exercise to go through
16 the plan and identify, well, what are the steps. We've
17 got notification, which, of course, encompasses the
18 regulatory agencies, both federal and state, as well as
19 your contractors. And then the response steps.

20 So you've got the notification on the GRPs where
21 you're telling people close down intakes if they have
22 intakes. You're doing your equipment deployment
23 starting clearly with your assets right there at the
24 site. But then Clean Rivers Co-op as they are notified
25 then start to also deploy equipment.

1 And so what's very clearly defined in the
2 Northwest area plan are the GRPs. These are specific
3 locations where tactics or strategies would be put in
4 place to either protect sensitive areas or to use as
5 places where we would redirect oil for collection in
6 some areas.

7 And so those GRPs are some of the things that
8 are tested sometimes during the actual employment
9 exercise by the contractors. Contractors are familiar
10 with these locations.

11 And so on paper then what we were doing is
12 identifying what resources were coming from what
13 location and then tasking them to specific geographic
14 response plans, GRPs. So you have some assets coming in
15 from Clean Rivers Co-Op, and it's contract based to
16 tackle containment at the site and then to put in
17 protection measures and collection measures downriver.

18 **Q. And did you run -- what assumptions did you make**
19 **about the -- I think you mentioned already the volume of**
20 **oil spills.**

21 **What about the types of oil that was spilled?**

22 A. We ran two different scenarios. One was for a
23 Bakken spill, assuming the full tank was Bakken. And so
24 we used that. We modeled the weathering aspect for the
25 Bakken using the ADIOS model, so we had the 41, I

1 believe, about 41 API for that particular Bakken to look
2 at the weathering.

3 And then we used the trajectory that's in the
4 spill contingency plan for the 48-hour sort of
5 progression of what you might expect that oil front to
6 be as it progresses down the river. And for the dilbit
7 case, the same volume, we used the dilbit that's again
8 in ADIOS. I think it was about 18.9 API.

9 And for the two scenarios, we used different
10 conditions. One condition was for the Bakken was
11 something that was going to be a fairly intermediate
12 atmospheric condition, so you have light end evaporation
13 and transport, given that some of the concerns about
14 Bakken is its light ends.

15 And then for the dilbit, we ran a scenario that
16 shows under winter conditions, sort of colder
17 temperatures, because the colder temperatures would be
18 the case in which if there was going to be some
19 submergence or sinking, that would most likely happen
20 during the cold weather conditions.

21 MR. KISIELIUS: I want to ask you some more
22 questions, but again, for the council's benefit, the
23 summary of the spill response, the exercise report is
24 also attached to the application for site certification
25 beginning on Page 3213.

1 BY MR. KISIELIUS:

2 Q. So you've described the differences in the
3 dates, why you chose those. Let's go back to the API
4 gravity that you assumed, because you said it was 41 for
5 the Bakken.

6 Do you recall what it was for the --

7 A. I believe it was 18.9 for the dilbit.

8 Q. And given that the range is 15 to 45, how did
9 you get those numbers?

10 A. Again, those are the values that are in the
11 ADIOS model, so we were using something that is already
12 sort of a standard oil in the NOAA database.

13 Q. So based on what you've done, would you expect
14 the behavior of oil at densities from 18.9 down to the
15 low end of the range, 15, would you expect those to
16 behave similarly?

17 A. Yes.

18 Q. And why?

19 A. There's -- I mean, there's a slight difference
20 in specific gravity, clearly, but it's the same
21 processes are going to happen. We'll get some
22 evaporation, some spreading, and you'll get a gradual
23 increase in density with residue. But I wouldn't expect
24 anything substantially different.

25 Q. Okay. Can you summarize your conclusions about

1 **what that analysis in the drill told you regarding the**
2 **response capability on the river?**

3 A. Yes. It was very useful in terms of identifying
4 the locations for priority booming. Again, these
5 booming sites are set up by priority. So able to go in
6 and identify where resources were coming, people,
7 equipment, boom, personnel, to deploy each one of those
8 locations. And, but also to do that in context of the
9 time element so that if portions of the spill are not
10 contained and still moving with the current, then you
11 want to get ahead of it and know that you can implement
12 certain strategies ahead of your spill.

13 **Q. Did it give you a tool to evaluate the amount of**
14 **resources, whether they're sufficient?**

15 A. Yes, it did. When you sum up the resources that
16 are being cascaded in on this time basis, then it really
17 gives a much clearer definition of the total amount of
18 boom, total amount of skimmer capacity, personnel,
19 boats, et cetera, available at these very specific time
20 slices.

21 MR. KISIELIUS: Your Honor, I'm going to ask
22 the witness to refer to Exhibit 154.

23 Now, I understand this is one where you were
24 reserving a ruling on whether it should be admitted I
25 think on the basis of the language at the top, the

1 header references the draft DEIS. And so I'd ask for
2 your guidance on how to proceed, but I could start with
3 having the witness explain the creation of the document
4 and what it purports to show.

5 To my understanding, and I can ask -- I
6 don't believe there's an objection from the other
7 parties. I think this is a DEIS-related issue.

8 JUDGE NOBLE: All right. Why don't you have
9 the witness get started and I'll try to call it up and
10 check it one more time.

11 MR. KISIELIUS: Okay.

12 JUDGE NOBLE: Thank you.

13 BY MR. KISIELIUS:

14 Q. Dr. Taylor, did you evaluate -- did you actually
15 compile based on that drill sort of actual numbers of
16 the different types of response measures available,
17 linear feet of boom and that sort of thing?

18 A. Yes.

19 Q. And did you compile that in a table?

20 A. I did.

21 Q. And did you compare that against what, from a
22 regulatory standpoint, would need to be required -- or
23 what would be needed to respond to a worst-case
24 discharge?

25 A. That's correct.

1 MR. KISIELIUS: And the exhibit.

2 JUDGE NOBLE: Just to confirm, is there any
3 objection to Exhibit 154? 154 is admitted.

4 MR. KISIELIUS: If we could have 154
5 projected, please. Perhaps this might explain. Thank
6 you.

7 BY MR. KISIELIUS:

8 Q. Is this the table that you created?

9 A. Yes.

10 Q. And I think part of the confusion here, it
11 references the DEIS Appendix D.4. What were you
12 referring to with that reference?

13 A. Section 7.1.6 of the oil spill contingency plan
14 that's in the application materials talks about spill
15 response resources.

16 Q. Okay. Was it your intent to mimic what's in
17 there or does this reflect the summary of your spill
18 drill?

19 A. This is a summary of the spill drill. And
20 bottom line, it's a little different than what's in the
21 table in that section.

22 MR. KISIELIUS: Ms. Mastro, could you please
23 advance it one page to the next one.

24 BY MR. KISIELIUS:

25 Q. What are we looking at here?

1 A. So this is that same information, but now it's
2 presented in context of the regulatory planning
3 requirements under Ecology --

4 **Q. Could you -- I didn't mean to interrupt. Go**
5 **ahead.**

6 A. That's okay.

7 **Q. You had earlier described cascading resources**
8 **and the requirements to have things available at certain**
9 **times. Does this table depict that?**

10 A. That's exactly right. On the left-hand side
11 you'll see the hours, and so, for instance, top row
12 shows two hours and then the planning standard which
13 shows that there's a requirement to have 2,000 feet of
14 boom -- (Court Reporter interruption.) Requirement for
15 2,000 feet of boom. And then the next line shows the
16 results of the spill exercise where we have the sum of
17 the boom that was available at two hours, so in that
18 case, for instance, it's 4,200 feet of boom was
19 available in two hours.

20 So you can work through the 2-hour, 6-hour,
21 12-, 24-, and 48-hour cascading events, looking at the
22 increases that you bring in. In terms of skimmer
23 capacity, that's EDRC, storage and boom and personnel.

24 **Q. So let's start with boom.**

25 **What does this show about your conclusion about**

1 **the availability of boom to address a worst-case**
2 **discharge from the facility?**

3 A. Well, the bottom line is the boom greatly
4 exceeds the required -- the planning standards defined
5 in the State of Washington requirements for the
6 facility. So in each case at each step through this
7 cascading response, you have much more boom than what is
8 specifically identified in the regulation.

9 **Q. Can you describe the storage capacity?**

10 A. Storage capacity is the one area where the first
11 2 and 6 hours we show a surplus of storage capacity, and
12 then at 12, 24 and 48 hours, it shows a relative deficit
13 in storage capacity. That is the capacity to handle the
14 liquid stream that's coming from the skimmers. But that
15 is because this sum is only for the transportable mobile
16 storage devices, so it doesn't include any shoreside
17 tanks. It doesn't include, for instance, a spot
18 contract with barges or anything like that.

19 It's just these are the assets that are in the
20 western region resource list that shows all the
21 equipment that is available to the contractor at their
22 different locations and the times that it would show up.
23 So these are mobile resources.

24 **Q. So how would a facility typically make up that**
25 **storage deficit for planning purposes and preparedness**

1 **purposes?**

2 A. In several ways. For a fixed facility like this
3 you have storage at the facility, so you have tankage
4 available at the facility that you could potentially
5 use. And you also have tankage available at downstream
6 or local storage facilities up and down the river, and
7 that can be done through contractor and other
8 arrangements to use that fixed storage. Again, that's
9 not storage that's being mobilized. It's fixed. So
10 you're taking your waste stream and depositing at these
11 storage locations.

12 Or you can contract barges. There's lots of
13 barges and vessels operating on the river, so if a spill
14 happens, the other aspect is to contract a barge.

15 JUDGE NOBLE: Dr. Taylor, we have a question
16 from Mr. Stephenson.

17 MR. STEPHENSON: Thank you.

18 Dr. Taylor, I'm just trying to clarify so I
19 understand your table.

20 The fourth column, boom in feet, some of the
21 numbers there look awfully large. Am I getting that
22 right? Those look like maybe 15 miles of boom?

23 THE WITNESS: You are getting that correct.
24 There's a lot, a lot of boom, yes. Prestage up and down
25 the river, yes.

1 JUDGE NOBLE: Thank you. Sorry for the
2 interruption.

3 BY MR. KISIELIUS:

4 **Q. Returning to the storage and the strategies that**
5 **you just described for making up that deficit at the**
6 **later hours of a response, is that a common approach to**
7 **use shoreside storage or to contract with a barge?**

8 A. Yes. I mean it's certainly something that
9 Ecology, for instance, has worked where there's other
10 facilities that may have a limited or apparent deficit
11 on just mobile storage then there's an allowance to look
12 and identify how those resources can be provided through
13 fixed storage facilities.

14 **Q. Okay. So based on this drill and based on your**
15 **experiences with spill response, are the resources and**
16 **capabilities on the Columbia River sufficient to respond**
17 **to a potential spill from this facility for the types of**
18 **oils that the facility contemplates handling?**

19 A. I think, you know, this exact type of exercise
20 shows that there's a tremendous pool of assets that can
21 be brought to bear on a spill, and in this case, a
22 worst-case discharge in the area. So yes, I think
23 there's a clear capacity to deal with a substantial
24 spill.

25 **Q. And here we're talking, again, about the**

1 regulatory worst-case discharge which you defined as the
2 contents of a tank.

3 How does that compare to, for example, a spill
4 that -- a size of a spill that you might expect due to
5 the transloading operations, so rupture of a loading
6 hose, for example?

7 A. Well, those spills from a loading hose are going
8 to typically be much, much smaller, vastly smaller. But
9 that being said, I mean, all these resources are
10 available immediately and within these time frames for
11 response to any spill.

12 Q. So is your analysis of the availability of
13 resources equally applicable to that type of a spill?

14 A. Yes.

15 Q. And what about vessels; are the same offsite
16 resources available for spills from vessels?

17 A. Yes. Same thing. I mean, most of these are
18 MSRC and Clean Rivers Co-Op, which are the assets that
19 really generally apply to the same coverage provided to
20 vessels on the Columbia River through MFSA, yeah.

21 Q. And we had some testimony the other day about
22 MFSA as well.

23 I want to talk about a specific spill that
24 Ms. Harvey references in her testimony and that's the
25 Mobil Oil spill. Are you familiar with that incident?

1 A. Yes. I've read the literature on it.

2 **Q. She said that oil spilled travel down the**
3 **Columbia and out the mouth and down the West Coast."**

4 **Is that accurate?**

5 A. Well, oil did travel down the Columbia River,
6 currents transported oil down that way. There were
7 some, as I recall in the NOAA technical memorandum,
8 there was a light tar balling observed on some of the
9 beaches to the north of the Columbia River.

10 **Q. And just to help us compare, is the oil involved**
11 **in that incident the same type as the type of oil that**
12 **the terminal will be handling?**

13 A. No. The oil on that vessel was all heavier.
14 The lightest product was a 12-something API, and some of
15 the tanks that ruptured were carrying around a 5,
16 5 1/2 API. So remember, 10 is fresh water, so less than
17 10 means that it is heavier than fresh water. So some
18 of the tanks carrying the 5.5, that's a sinker.

19 **Q. Putting aside a comparison of the response**
20 **measures for just a second, would just that difference**
21 **alone, would the oil in that instance behave differently**
22 **than what you'd expect from the oil that this facility**
23 **will be handling?**

24 A. Yes and no. I mean, generally you still have a
25 current transport. There was some of that oil did float

1 because it had an API gravity of 12-something, so there
2 was a component that floated and spread on the surface.
3 But then there was a certain component of that oil that
4 also was -- settled into the water column, so you had
5 suspended or submerged oil, and then some of it that
6 sank.

7 **Q. Okay. What about spill response techniques,**
8 **measures available at that time given that -- we've**
9 **heard from Captain Bayer about the differences in vessel**
10 **design, so focusing just on the spill response measures,**
11 **are there differences in terms of what's available now**
12 **compared to what was available in 1984?**

13 A. Hugely different. I mean, the spill response
14 capability on the river now, just again, going back to
15 the analysis we did for the spill for the tabletop
16 exercise, and we have vastly more assets out there,
17 boom, skimmers, equipment than were available back in
18 1984, as well as a trained responder base that has
19 worked up and down the river with these assets, as well
20 as the detailed planning that's in place with the
21 Northwest Area Plan and the GRPs. So those -- none of
22 that really was in place in '84.

23 **Q. So based on that, how would you rate the ability**
24 **to respond from a timing standpoint comparing now to**
25 **when the incident occurred?**

1 A. You'd definitely see a much faster response and
2 a lot more assets immediately available around the
3 vessel itself for containment. Now vessels are
4 required, for instance, to have a salvage and fire
5 fighting plan which wasn't necessarily in place at that
6 time either. So you've got offloading capability and
7 then you have all the equipment and personnel that you
8 would bring to not just deal with the containing and
9 recovering oil, but also protecting sensitive areas
10 downstream.

11 **Q. And would you expect the recovery to be greater**
12 **now in your current mechanisms than what was available**
13 **in 1984?**

14 A. Yes.

15 **Q. So in your opinion, is the Mobil Oil spill and**
16 **response representative of how a response effort would**
17 **be carried out given those -- today, given those**
18 **differences?**

19 A. Only in the very broadest general senses in
20 command and implementing safety measures and trying to
21 do some salvage of the vessel, but the details of the
22 response will be vastly different.

23 **Q. I have just a couple more questions for you.**
24 **We've had some testimony and some questions related to**
25 **the recent Mosier derailment.**

1 **Are you familiar with that?**

2 A. Yes.

3 **Q. I want you to just talk about your familiarity**
4 **with the spill response portion. And so what have you**
5 **reviewed to become familiar with that incident?**

6 A. Yeah. I was not personally onsite, but I've
7 reviewed the Washington Ecology sit reps and the record
8 that they have on the spill response, EPA's reps and
9 then the presentation that the EPA federal on-scene
10 coordinator gave at Clean Pacific just a week and a half
11 ago.

12 **Q. Are you familiar with how much oil reached the**
13 **river?**

14 A. I know that what was reported on the Columbia
15 River was only a sheen, and that was after the first
16 day, and that was within the containment boom that was
17 placed on the river at the outlet of Rock Creek. That
18 was the only oil that was observed on the river, a
19 sheen.

20 **Q. And did the response follow that GRP in place**
21 **for that area to your knowledge?**

22 A. Yes. Again, you had the state and federal
23 on-scene coordinators from both sides of the river
24 engaged and the Northwest Area Plan was enacted. It was
25 put in place with GRPs being put in place.

1 **Q. How quickly did responders reach the site, the**
2 **spill response?**

3 A. On the spill response side? I know that Ecology
4 reported they had a boat in the water within an hour,
5 they had overflight within two hours, and boom was in
6 place at the mouth of the creek before the end of that
7 first day.

8 **Q. And in your opinion, was the response from a**
9 **spill standpoint sufficient?**

10 A. Again, I think it demonstrated that there's a
11 tremendous amount of assets and trained personnel
12 available to respond quickly to those situations, and I
13 believe the EPA FOIC reflected that in his presentation
14 at Clean Pacific as well.

15 **Q. Are the spill response measures, is this**
16 **incident representative of what you'd expect of a**
17 **similar event elsewhere along the rail corridor?**

18 A. Yes, very much so. Setting up unified command,
19 identifying your priorities, implementing the GRPs, and
20 doing containment at the spill site. Of course, you
21 have all the usual priorities that go with the spill,
22 ensuring safety of the public and your responders,
23 monitoring tracking and all the rest of it. But the
24 same procedures that took place there would happen no
25 matter where that spill would happen.

1 **Q. And it sounds like with the sheen there wasn't a**
2 **lot in the river.**

3 **What would happen if more oil had entered the**
4 **river? Would the response be -- how would the response**
5 **be different?**

6 A. Well, the main difference is you would see a lot
7 more assets on the water. In this case, you had boom
8 out there to contain anything that came out of the
9 creek, but if there were more oil that was coming out of
10 the creek or there was more oil in the river, I would
11 expect you'd see a lot more boom around the spill
12 location itself, the containment.

13 Going back to what I was talking about earlier
14 where you would have multiple players of boom to do a
15 containment as well as protection downstream and then
16 oil recovery. If it was recoverable oil, you would be
17 conducting oil recovery operations on the water.

18 **Q. So based on your understanding of the response**
19 **capabilities along the river, is the spill response, is**
20 **that capability sufficient to respond to a derailment**
21 **incident, in your opinion?**

22 A. Yes. Same conclusion as we draw from the
23 worst-case spill with the tanks. I mean, those assets
24 are available to respond on the river.

25 **Q. And again, so in terms of the size that you're**

1 **planning to prepare for facility spill, that worst-case**
2 **discharge, compared to the size of a train, comparing**
3 **those, what's your assessment of the sufficiency of the**
4 **response capabilities?**

5 A. Our worst-case spill exercise is looking at
6 380,000 barrels, so you're not going to get -- it's
7 impossible to get that amount out of a train even if
8 every car breached and every car spilled directly into
9 the water. It just doesn't carry that much oil, so the
10 volume would be less than the worst-case spill defined
11 for the facility.

12 **Q. So just to summarize, after your review of the**
13 **spill response plans and the review of the available**
14 **resources up and down the river, do you have an opinion**
15 **about whether the response planning and capability for**
16 **the facility are sufficient to mitigate the impacts of**
17 **an oil spill?**

18 A. Yes. I mean, clearly there is an extraordinary
19 amount of spill response capability here in the State of
20 Washington and on the river. There's a tremendous
21 amount of assets, there's a lot of trained personnel.
22 And so -- and then there's plans in place to put that
23 equipment and personnel in place in a very short
24 timeframe.

25 I think it vastly addressed a worst-case spill.

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1 And when I compared this capability to anywhere else in
2 the world, it just completely exceeds what you see in
3 other places.

4 Q. Has anything you've read in testimony made you
5 change your opinion?

6 A. No.

7 MR. KISIELIUS: I have no further questions.

8 JUDGE NOBLE: Thank you.

9 Cross-examination?

10 CROSS-EXAMINATION

11 BY MS. BOYLES:

12 Q. Mr. Taylor, my name is Kristin Boyles and I'm
13 counsel for some of the intervening opposing parties and
14 I have some questions for you on cross this afternoon.

15 I actually wanted to start with some of the
16 examples that you discussed in your direct prefiled
17 testimony.

18 A. Okay.

19 Q. In Paragraph 39 of that testimony, which is on
20 Page 14, you discussed a spill of Bakken crude into the
21 Mississippi River in 2014?

22 A. Okay. Just bear with me for a second.

23 Q. Certainly.

24 A. Yes.

25 Q. And that spill was approximately 750 to

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1 800 barrels; is that correct?

2 A. That is what was reported, correct.

3 **Q. And it is your understanding that 2.3 barrels**
4 **were recovered from that spill; is that correct?**

5 A. That is what was reported, correct.

6 **Q. Are you also aware that the state and federal**
7 **estimates were that about 46 percent of the oil**
8 **evaporated?**

9 A. Yes.

10 **Q. So that means about half of that spilled oil was**
11 **unrecovered; is that correct?**

12 A. That is correct, unaccounted for.

13 **Q. Okay. That would mean it's in the river; is**
14 **that correct?**

15 A. Or there was a limited amount that hit the
16 shoreline. A bit may have been tied up there. And
17 there was some that had made contact with the hulls of
18 some vessels downstream. So small quantities, but
19 between those, yes, that accounts for the other portion.

20 **Q. Thank you.**

21 **And are you also aware that the Coast Guard and**
22 **the NOAA, or National Oceanic and Atmospheric**
23 **Administration, reported that there high evaporation**
24 **rates of that Bakken oil from that Mississippi spill?**

25 A. Yes, that is one of the characteristics of a

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1 very light oil.

2 **Q. And that that high evaporation rates posed a**
3 **hazard for first responders and the public who were near**
4 **the spill?**

5 A. Volatile organic carbon coming off during
6 evaporation of any light ends is going to be a safety
7 concern for the public and responders.

8 **Q. And the reports from the spill also stated that**
9 **those high levels of polycyclic aromatic hydrocarbons**
10 **were dissolved in the water column as well?**

11 A. Well, there certainly is the potential for those
12 to be -- a portion of those PAHs, or poly aromatic
13 hydrocarbons, to dissolve into the water column. I
14 don't think they actually did a full analysis of the
15 distribution of the PAHs in the water column, but yes,
16 some can dissolve.

17 **Q. And this was a spill from a double-hulled barge;**
18 **is that correct?**

19 A. That's correct.

20 **Q. You also a little bit later in your testimony,**
21 **Paragraphs 40 and 41 on Page 15, talk about the Poplar**
22 **Pipeline spill into the Yellowstone River that's in**
23 **2015?**

24 A. Uh-huh.

25 **Q. And is it correct there that you state that**

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1 there were unrecoverable sheens of oil identified
2 73 miles downstream in the first days?

3 A. Yes. In some of the overflights, there was a
4 very faint silver sheen, which is sort of the last
5 vestige of oil that you can detect on water. Very faint
6 ribbons of that were identified at that distance
7 downstream.

8 **Q. And this spill was Bakken as well, I believe.**

9 A. That was a Bakken spill crude also.

10 **Q. And is it -- it's my understanding that that**
11 **spill contaminated a water treatment plant and public**
12 **water supply downstream; is that correct?**

13 A. Yes. There was Glendive, a city that is just
14 downriver. The intake was -- had not been closed and so
15 it drew in water that where some of that oil had
16 dispersed into the water column.

17 **Q. How far downstream is the Glendive plant?**

18 A. I think it says in here, I think it was about
19 six miles or something like that downriver.

20 **Q. And do you know how fast the oil got there?**

21 A. Well, they don't know exactly when the spill
22 initiated, so there isn't a start moment. So there's
23 not an actual measure of, you know, time between where
24 the spill initiated and the fact that when they noticed
25 that there was oil in the intake.

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1 In either of these two cases, though, there's no
2 containment. There is no booming happening in either
3 one of these cases, so this is oil that is just free
4 flowing, right.

5 **Q. And the estimates were that that pipeline spill,**
6 **the Poplar Pipeline spill, was between -- it's a large**
7 **estimate -- 300 and 1,200 barrels?**

8 A. Yeah. They had not pinned down the actual
9 volume.

10 **Q. And 60 barrels were recovered?**

11 A. I'm trying to recall now if I have that in here.
12 I don't recall. I don't recall what the actual final
13 recovery value is. I'd have to look it up.

14 **Q. It's my understanding that the percentage that**
15 **Tesoro Savage expects to recover in a spill is**
16 **10 percent; is that correct?**

17 A. I would say that they should expect and would
18 expect to have recovered a lot more than 10 percent.

19 **Q. What number -- and you were discussing this**
20 **earlier today, that Ms. Harvey refers to 10 percent**
21 **recovery. She's referring to the Tesoro Savage own**
22 **spill response documents, isn't that correct?**

23 A. Yes, she is.

24 **Q. What percentage does Tesoro expect to evaporate?**

25 A. Again, you know, we can model the oils and under

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1 different environmental conditions. So depending on
2 which oil you choose and what environmental conditions
3 you choose, there's going to be slight variations in
4 what you might expect to evaporate.

5 There's also a big difference between what might
6 evaporate. If you recall I mentioned the weathering
7 models we ran as though there was no containment. That
8 evaporation is going to be very different if you
9 actually have containment. It slows evaporation down.

10 **Q. Did the January 2016 tabletop drill using**
11 **evaporation estimate average 22 percent?**

12 A. Only in the sense that to give a sense of, for
13 oil that is not contained and collected, what might be
14 happening to that portion of the oil. So it's giving
15 you an indication of what isn't -- what is still perhaps
16 on the river is still undergoing weathering and there's
17 going to continue to be some evaporation. So there's
18 some volumetric loss for the portion of oil that is not
19 contained and being collected.

20 **Q. Okay. And on that subject of diluted bitumen,**
21 **or dilbit, is it your testimony that spilled dilbit**
22 **won't sink unless it's weathered for about a week; is**
23 **that correct?**

24 A. Our experience with doing tests in labs in the
25 flumes where we actually have flowing water and we allow

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1 this oil to weather naturally, the cold lake bitumen
2 never sank even over ten days of just constantly running
3 it around a racetrack with, you know, under different
4 temperature conditions. It never sank.

5 And one product, as reported in the
6 CRREL/SL Ross report, showed submergence, that a flume
7 test that Environment Canada ran showed droplets
8 submerging from one product. But the vast majority, if
9 not all, of that oil will remain floating.

10 **Q. And just to be clear, Dr. Taylor, those studies**
11 **you're referencing are laboratory investigations; is**
12 **that correct?**

13 A. There's the -- they're a combination. I mean,
14 they're all tests, but they're done at different scales.
15 There's some, for instance, Environment Canada report
16 that's in one of these exhibits here are largely
17 laboratory bench tests, whereas the other ones are what
18 we called meso-scale tests, so they're tanks, large
19 tanks where you can impose different conditions.

20 **Q. Okay. Not a real world spill?**

21 A. No, not where somebody is putting it out in the
22 real world.

23 **Q. Thank you.**

24 **Are you familiar with or have you read the**
25 **National Academy of Sciences report on pipeline dilbit**

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1 spills?

2 A. Yes.

3 MS. BOYLES: And that, for the benefit of
4 the council, is Exhibit 5515.

5 BY MS. BOYLES:

6 **Q. Does that report find that the density of**
7 **residual oil does not necessarily need to reach or**
8 **exceed the density of the surrounding water in order to**
9 **sink?**

10 A. Not in that context. What it says is that with
11 increased density and combined with sediment, there's a
12 possibility that some portion of oil can sink. But
13 strictly through increase in density, no, unless that
14 density exceeds fresh water density.

15 **Q. Is it your understanding -- is it correct that**
16 **the National Academy report goes on to discuss that the**
17 **weathering of dilbit can happen within days and that how**
18 **dilbit is of a particular concern because there are few**
19 **techniques for detecting, containing and recovering**
20 **submerged and sunk oil?**

21 A. Again, I don't have it in front of me so I'm not
22 going to read -- if you're reading it, I'll trust you.
23 But the weathering happens from the moment oil is
24 exposed to the atmosphere, so it's incorrect to say oil
25 weathering occurs within days because it starts within

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1 minutes and it continues for days and days and weeks and
2 into months.

3 And if a portion of that oil were to submerge
4 and sink, it doesn't mean that there's not ways to deal
5 with it. There are ways. As I pointed out here, you
6 even have API documents that were just issued last year,
7 late last year in December of 2015, on lessons learned
8 with submerged and sunken oil, techniques that have been
9 tested, techniques that seemed to be most viable for
10 delineation, detection and recovery of oil within the
11 water column or sunken oil.

12 **Q. Would you agree that the sinking of dilbit**
13 **and -- or the submerging of dilbit is an area where**
14 **there's currently ongoing scientific debate and**
15 **research?**

16 A. There's a lot of research going on about dilbit
17 right now, and there is continued research to look and
18 characterize the different oil sands products, the range
19 of the products and the range of those behaviors. So
20 that is ongoing research. One aspect is, indeed, to
21 characterize the weathering behavior to see how the
22 density changes through time.

23 I also know there's a lot of controversy about
24 how those tests are done. If you take, for instance,
25 the Environment Canada report that's in here, those lab

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1 tests are done by heating the oil to look at how the
2 density changes through forced evaporation. And some of
3 that heating is taking place at about 80 degrees
4 centigrade, which is something that we would never have
5 in the natural environment. So you're basically cooking
6 the oil. So there's -- in these tests one of the key
7 considerations to bear in mind is how they're being
8 done.

9 **Q. Turning to the January tabletop exercise that I**
10 **understand you took part in that; correct?**

11 A. Yes.

12 **Q. So just I'm clear on this, there's no actual**
13 **equipment deployed; is that correct?**

14 A. Correct. This is a tabletop exercise, so you're
15 using the equipment listed in the plan that Vancouver
16 Energy has identified as the assets it will have onsite
17 and the assets that the contractors have at different
18 staged areas.

19 **Q. And then you identified a list of contracting**
20 **services for submerged oil; is that correct? Is that**
21 **your testimony?**

22 A. Yes. In the dilbit scenario, one of the things
23 was we looked at in the eventuality that a portion of
24 dilbit were to mix with sediment and be submerged or
25 sink, then that would be the assets that you would bring

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1 to work that spill.

2 **Q. Have any companies responded to a dilbit spill**
3 **in the Columbia River?**

4 A. We've not had a dilbit spill in the Columbia
5 River.

6 **Q. Are there contracts with those companies for**
7 **such a spill response?**

8 A. Well, the facility itself, I don't know if they
9 have contracts. I mean, it's not an operating facility.
10 They're clearly identified and they are an asset that
11 Clean Rivers Co-Op and MFSA have identified for the
12 eventuality of submerged and sunken oil.

13 Asphalts, don't forget, will submerge and sink
14 as will some bunkers. Again, we have oils that straddle
15 and exceed the range of the oils that are being
16 transported or being proposed for the facility, and
17 there's a response capability on the Columbia River to
18 deal with that range of oils.

19 **Q. Let me just ask a question about that range.**

20 **I believe you testified this morning that the**
21 **range is from 15 API to 45 API expected at the terminal;**
22 **is that correct?**

23 A. Yes.

24 **Q. In the Port's amended lease for Tesoro Savage,**
25 **it says they're only going to use pipeline grade crude.**

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1 Are you familiar with that language?

2 A. Not from the application materials. I can't say
3 that I recall.

4 **Q. And pipeline, it's my understanding the pipeline**
5 **grade crude can be as low as 10 API; is that correct?**

6 A. No, I know that cannot be. As a matter of fact,
7 pipeline grade crude has very specific tolerances for
8 specific gravity and I can't tell you exactly what that
9 is. I think it's closer to 18, if not a little bit
10 above 18, and even more importantly, it has to have a
11 specific viscosity. It has to be less than
12 350 centistokes at pipeline temperatures.

13 **Q. We talked about prebooming this morning with Mr.**
14 **Kisielius.**

15 **If Tesoro can't preboom, can they still load oil**
16 **at the terminal?**

17 A. Yes. I think that's what we discussed earlier.

18 **Q. If Tesoro cannot preboom due to conditions, be**
19 **it the current or wind or the waves, it could choose not**
20 **to load during those times, isn't that correct?**

21 A. That would be an option if it wanted to.
22 Clearly, it does set unsafe thresholds. So you know
23 that if conditions are at those unsafe thresholds, there
24 would not be any transfers.

25 **Q. Was it your testimony this morning that you**

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1 believed most of the time prebooming is possible?

2 A. Yes.

3 Q. You've discussed a little bit about the
4 Geographic Resource Plans or the GRPs throughout your
5 prefiled testimony and then this afternoon you discussed
6 it as a redirecting oil for collection. That was one of
7 the things that the GRPs helps do.

8 Are you aware if the Umatilla, Warm Springs,
9 Yakama, Nez Perce tribes have approved or consented to
10 those portions of those plans that call for booming and
11 collecting oil at their fishing sites?

12 A. I would have to say that I have no knowledge of
13 what that discussion is, and I'm not sure that it
14 applies downstream of the facility.

15 Q. For the Mosier accident which we were just
16 discussing a minute ago, that accident happened around
17 noon.

18 So is it correct to say that if it took to the
19 end of the day, that's about five hours to get boom into
20 the river?

21 A. It was in place by the end of the day. I can't
22 tell you specifically by what time, just that by that
23 time it was in. So don't quote me on the actual time
24 element for the deployment.

25 That being said, the boom was in place, there

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1 was no sheen on the water at the time that the boom was
2 put in place or that evening, and it wasn't until the
3 next day that there was a sheen. Again, this is that
4 faintest bit of oil that you could see on the water that
5 was in the -- was observed inside that boom.

6 **Q. Do you know when Tesoro Savage announced that it**
7 **was going to completely encircle the vessel with booms**
8 **during the prebooming as opposed to a partial**
9 **encircling?**

10 A. I don't have a history of sort of the
11 development of all the various stages of materials, but
12 I know that -- certainly last, in 2015, that was already
13 part of the plan.

14 **Q. So you don't know if that was after Ms. Harvey**
15 **submitted her testimony?**

16 A. Well, it was in 2015, last year, and her
17 testimony is this year. So I think it would have been
18 in place.

19 **Q. One last question, Dr. Taylor.**

20 **Would you agree that oil that reaches the**
21 **shorelines or reaches the shallower areas, whether it's**
22 **Bakken or dilbit, is harder to clean up and recover?**

23 A. Well, it's always best to try to recover oil
24 from on the water. The boom and skimmers are going to
25 be more efficient that way. Once it touches the

1 shoreline and strands on the shoreline, then you're
2 looking at other techniques to address that oil. So,
3 and they're usually going to take a little bit more time
4 and they need to be sensitively considered what
5 techniques are appropriate for what type of shoreline
6 that gets oiled.

7 MS. BOYLES: Thank you.

8 JUDGE NOBLE: Is there other
9 cross-examination? Redirect.

10 REDIRECT EXAMINATION

11 BY MR. KISIELIUS:

12 Q. Dr. Taylor, just a couple of short questions for
13 you.

14 Ms. Boyles asked you about two of the spills you
15 described in your report. I think you had mentioned
16 that there was no containment of those.

17 In response to one of her questions, you had
18 said that for the second of the two spills that there
19 wasn't an identified start time. Why is that?

20 A. Well, it was a pipeline release and the pipe
21 runs under the Yellowstone River. So there was a --
22 there was a smell that was detected, and that kind of
23 alerted people that there was a spill. But it wasn't a
24 sort of an instant rupture.

25 If you have a very quick release in a pipeline,

1 you're going to see a pressure drop in the operating
2 system and that kind of gives you an alert, plus it will
3 typically trigger a shut down in the pipeline. But if
4 it's a slow release, then it may not be detected for a
5 while. So that's where the issue is. We don't know
6 exactly when that release may have started.

7 **Q. And would the unknown start time affect the**
8 **ability to implement response measures in a timely**
9 **manner?**

10 A. Certainly. I mean, if you don't know when it
11 started then you're going to have to -- you're waiting
12 for some detection in order to trigger a response. You
13 don't know if you have a spill ongoing.

14 **Q. In your opinion, is that an issue, a risk**
15 **primarily associated with a pipeline as opposed to a**
16 **transloading facility?**

17 A. Very much so. Typically we'll get -- or not
18 typically, but it is more likely to occur within a
19 pipeline and particularly a buried pipeline than you
20 would have at a facility. A facility spill, first of
21 all, is generally contained at the facility. But the
22 secondary containment, usually that's where it stays if
23 you even do have a spill.

24 **Q. And Ms. Boyles asked you about the water intake**
25 **downstream.**

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1 In the event of a spill from this proposed
2 facility, would the GRPs and would the spill response
3 planning address that issue, in your opinion?

4 A. Yes. As a matter of fact, one of the items that
5 was added to the spill plan as part of the update
6 process, and again, this plan will be updated and would
7 regularly be revisited, but one of the items that was
8 added to the spill plan was in the fall 2015 updated
9 GRPs, which include a series of notifications. And so
10 yes, those notifications would happen immediately.

11 **Q. And in that incident that you described in your**
12 **prefiled testimony, now referring back to the pipeline**
13 **spill, was there any identified or reported oil wildlife**
14 **from that incident?**

15 A. No. There was no reported impacts to fish or
16 wildlife on either of those two spills.

17 MR. KISIELIUS: No further questions.

18 JUDGE NOBLE: Council questions?

19 Mr. Stohr has a couple.

20 MR. STOHR: Good afternoon, Dr. Taylor.

21 THE WITNESS: Good afternoon.

22 MR. STOHR: I wanted to ask a couple of
23 questions around the assumptions in your review of the
24 adequacy of the response system.

25 You talked a lot about the importance of the

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1 standards, the enforcement inspections, exercises, and I
2 think concluded or I think your words were "led to
3 probably the most stringent system in place as a result
4 of that."

5 And my question has to do with, my
6 understanding is most of those activities are funded via
7 a tax on barrels of oil that are imported. Do you know
8 if the facility is going to contribute to those
9 accounts?

10 THE WITNESS: Specifically, I don't know,
11 but I would imagine it would. Oil is being transported,
12 so it's somewhere in the process, oil -- a certain
13 funding would come from it. But I don't know if that's
14 going to be applied to the facility or the vessels or
15 how that works.

16 MR. STOHR: I think, I'm not sure, but I
17 think that is on marine receipt.

18 THE WITNESS: Okay.

19 MR. STOHR: So given that, what were the
20 assumptions about the State's ability to participate to
21 play those roles to build the stringent system as you
22 looked at the overall framework?

23 THE WITNESS: Well, it's been developed and
24 put in place over a series of years, clearly. I mean,
25 after the Exxon Valdez spill, in OPA 90 there was a

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1 complete overhaul not only federally, but also at the
2 state level, in terms of spill planning requirements and
3 planning standards.

4 We are one of the few states that actually
5 has these standards defined where we have an expectation
6 of, you know, reaching certain levels that exceed the
7 federal standards easily. And so that's one of the
8 components is that, you know, this is something that's
9 developed over time.

10 So Ecology has worked hard. There have been
11 times when they've been short on staff, and then there's
12 been times where the staff has been more robust. But
13 they participate in exercises, they go to -- I know
14 they're onsite checking the facilities and looking at
15 records. So it's an ongoing dialogue between I think --
16 and a very healthy dialogue between industry and the
17 regulator.

18 MR. STOHR: So if the facility wasn't
19 contributing to those accounts, they would carry on
20 those activities using some other fund source?

21 THE WITNESS: Well, yeah. Ecology's
22 activities are going to continue. How they're being
23 funded is another side. But they will and do continue
24 working with the facilities regardless, yeah.

25 MR. STOHR: Another question. I think this

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1 is my last one.

2 Do you know if the contingency plans
3 anticipate or allow discretion around dispersants or
4 around in situ burning for land spills?

5 THE WITNESS: No dispersants on land or even
6 on fresh water. Those are really not considerations.

7 Burning, in situ burning is different. Very
8 unlikely that you're going to get approval within the
9 timeframe. You have an operational window typically to
10 burn oil on water, and it's very unlikely you'll get
11 approval to do that within the timeframe for oil on the
12 river.

13 On land is a different matter. We know from
14 experience that oil in sensitive wetlands, vegetation,
15 sometimes the best thing you can do is actually to burn.
16 As long as the roots are wet and the ground is wet, it
17 doesn't damage that root and you get regrowth and you
18 don't create a lot of damage into those wetlands.

19 MR. STOHR: Thank you.

20 JUDGE NOBLE: Mr. Stephenson?

21 MR. STEPHENSON: Thank you, Dr. Taylor. I
22 have two areas I want to get after. One is to talk
23 about my earlier question.

24 That exhibit came up quickly to me, and so
25 when I saw that number of feet of boom, I thought it was

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1 at the facility, so it seemed like it was very high to
2 me.

3 THE WITNESS: Yes.

4 MR. STEPHENSON: Do you have an idea, and
5 I'm sure it's in here somewhere, do you have an idea of
6 about how many feet of boom are at the facility and
7 maybe a recommendation of how many you think should be
8 there?

9 THE WITNESS: Well, certainly. I know that
10 when you talk about prebooming there and having
11 conditions where if you can't preboom you're going to
12 have boom on standby is four times the largest vessel
13 length. So that is the minimum that would be at the
14 site. And if you go back to that exhibit --

15 MR. STEPHENSON: It was 154.

16 THE WITNESS: Yes. The assets that you have
17 at about two hours, those generally are -- mostly, I
18 can't say that they're exclusively at the facility, but
19 most of those are facility assets.

20 MR. STEPHENSON: Do you have an idea of how
21 many of the many miles of boom are in the control of the
22 rail?

23 THE WITNESS: Well, I know that rail, BNSF,
24 for instance, has contracts with the same contractor
25 base, Clean Rivers Co-Op and MSRC, so they could tap

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1 into the same level of capability here, as well as they
2 have their own assets and their own equipment caches in
3 places which aren't reflected here.

4 MR. STEPHENSON: My second area is around
5 sinking and floating. The crude oil coming in is a
6 mixture of a whole bunch of hydrocarbons, right?

7 THE WITNESS: Correct.

8 MR. STEPHENSON: So some of them might sink
9 and some of them might not, or some of them might be
10 soluble, some of them might not. How does that work?

11 THE WITNESS: If you just go to general oil,
12 there's a big range. And as you know, if you take an
13 asphalt, that is hydrocarbon. It's a petroleum
14 hydrocarbon and you can drop it in water and it's going
15 to sink.

16 So potentially within the world of crudes,
17 there are crudes that have that end of heavy oils, and
18 then, of course, you have the light ends. So the light
19 ends are the one that are evaporating off. The heavy
20 ends are what's being left behind.

21 So really it kind of depends on what the
22 source of your crude is, what the extent and content is
23 of those heavy ends. I know from a fact if I just go to
24 some of the raw bitumen, this is not stuff that's been
25 blended, but just the raw bitumen out of the oil sands.

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1 There are bitumens that are less, lighter
2 than water. If you took the raw bitumen, it still
3 wouldn't sink. There's other bitumens that are heavier
4 than water, but when you blend that with a condensate,
5 you don't have a heavy and a light thing kind of
6 floating around and then here goes the light thing and
7 now you're left with the heavy thing. That's not what
8 happens.

9 When you blend it, you're actually forming a
10 new series of hydrocarbons that represent that range.
11 So you're losing light ends, but you still have an
12 intermediate range and then you still have your heavy
13 end. So there's a gradation over time slowly towards
14 those heavy ends.

15 For instance, the lab studies that
16 Environment Canada did here, they showed that if you
17 cook it 80 degrees C over a period of I think it was two
18 weeks, you can get back to the raw bitumen. But that's
19 what they had to do to get it back to that condition,
20 was to cook it for a very extensive period of time.

21 So I hope that puts it in context. You
22 don't suddenly have a flash-off of light ends and now
23 you're left with bitumen. That's not what happens.

24 MR. STEPHENSON: One more thing. Same
25 question.

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1 In your prefiled testimony, you don't need
2 to look this up because I can give it to you quickly,
3 but it's Page 13, Paragraph 36, Lines 6 and 7, you note
4 that "Very light oil, such as a Bakken crude, are able
5 to penetrate meters in sand and coarser sediments given
6 their low viscosity when fresh."

7 So how does that happen if they don't sink?

8 THE WITNESS: We're talking about, for
9 instance, in soil or at the river bank, for instance.
10 If a spill hits the river bank, then it can move into
11 the sand just like the water does.

12 What's important to know, though, is that it
13 can flow into the pour spaces in the sand and flow out
14 as well. So it doesn't necessarily mean it flows in and
15 then it just stays there.

16 There certainly is a grain size at which
17 there's going to be some of what we call retention.
18 That is there's a grain size where some oil will
19 actually now, once it moved in, it's not going to
20 necessarily easily flow out. And so for a light crude
21 oil, like a Bakken, it requires something in a finer
22 grain, like a silt, for it to actually start to really
23 retain, because it will flow in and out of the sand.

24 Does that answer your question?

25 MR. STEPHENSON: For the most part.

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1 I also note in your prefiled that you helped
2 respond in Alaska. And certainly some of the spill up
3 there in Prince William Sound wasn't in sand, it was in
4 pretty dense rocks, and stayed down fairly deep for a
5 long time.

6 So is that -- how does that jibe with what
7 you just told me?

8 THE WITNESS: Okay. Yes, I mean, I've been
9 part of a series of studies that took place up there and
10 got a couple of my publications are specifically on sort
11 of long-term residence of that crude oil on select
12 portions of Prince William Sound beaches. It took a
13 very special combination of factors for that oil to be
14 trapped in a certain grain size.

15 As it turns out, it is a fine sand where
16 most of that oil is trapped, but that fine sand is
17 actually covered by a coarse cobble pebble cover. So
18 that coarse cobble pebble cover absorbs a lot of the
19 energy from wave action and tidal action. So what's
20 happening is that what was able to penetrate into the
21 sand, and again, these are very select small pockets.
22 You'd be very hard pressed to know exactly where these
23 happen.

24 But it takes a very specific set of
25 conditions of what we call armoring, that is, that

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1 protection afforded by these cobble pebble class on top,
2 separating and isolating the fine sand underneath. And
3 a lot of those fine sands actually have a layer of peat
4 associated with them and that combined set of sort of
5 fine grain is what has held that oil in place. And it's
6 not -- the natural processes are slow to work to degrade
7 the oil, so the oil characteristics have changed in
8 terms of the PAHs and that sort of thing.

9 But it's very, very slowly reducing the
10 volume. It's a very slow process because it's fairly
11 isolated. It's what we call sequestered oil.

12 MR. STEPHENSON: Thank you.

13 JUDGE NOBLE: Mr. Shafer?

14 MR. SHAFER: Dr. Taylor, thank you for your
15 testimony today, and I know there's been quite a bit of
16 discussion on oil particles whether they be suspended or
17 settled.

18 My question is are salmon beds -- in your
19 judgment, if there is a spill, are salmon beds at risk?

20 THE WITNESS: I think that salmon beds would
21 generally not be at risk. They're not typically going
22 to be in areas where you have a high sediment suspended
23 sediment load. They're usually where you have clear
24 water. So I don't think that would be -- for the case
25 where we're looking at oil-sediment interaction, you

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1 just don't have those.

2 MR. SHAFER: Okay. Thank you.

3 And second question, of course the Columbia
4 River Basin having the abundance of wildlife which it
5 does, in your judgment, are there any fish species or
6 bird species or any endangered species or any other
7 species in general which would be at a significant risk
8 in the event of an oil spill?

9 THE WITNESS: Well, I mean, clearly there's
10 plenty of species, including the endangered species,
11 both in the river and using the river banks and
12 associated habitats. To the extent that they're exposed
13 to the oil, usually the ones that are most at risk from
14 the birds are the waders or the ones that are diving
15 birds and ducks.

16 So, but again, part of the GRP strategy is
17 to keep it out of these areas where they tend to utilize
18 those areas mostly. So if you're in the back sloughs
19 and marshes and areas like that, those are precisely the
20 kind of areas the GRPs have booming identified so that
21 oil doesn't get into those areas.

22 So I think the whole point of having these
23 predefined GRPs are to minimize that potential risk.
24 That some could be exposed? Yes, some could be exposed.
25 But really the goal is to make that minimal as possible.

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1 MR. SHAFER: Thank you.

2 JUDGE NOBLE: Mr. Snodgrass?

3 MR. SNODGRASS: Good afternoon, Dr. Taylor.
4 A couple of questions. I guess one, just wanting a
5 little clarification on the nature of submerged oil, is
6 that once oil is submerged, does it reemerge or is it at
7 that point the only recovery is through the other
8 methods you mentioned?

9 THE WITNESS: No. As a matter of fact, on
10 rivers, because you have currents that actually are
11 moving not just laterally on the water surface, but also
12 within the water column, it's not unexpected that you'll
13 get some, what's called entrainment of oil into the
14 water column, but then it resurfaces. And particularly,
15 if you have submerged oil, it may be just temporarily
16 submerged. Once you get into quiet areas where there's
17 less turbulence, you can see that refloating.

18 The other side is even oil that is attached
19 sometimes to the sediment, the oil particulate
20 aggregates, there are in cases where that's been
21 observed also to separate from the particle from itself
22 and refloat to the surface. So it doesn't mean that
23 it's actually captured and permanently going to stay on
24 the bottom, for instance.

25 MR. SNODGRASS: Is there any kind of a

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1 ballpark estimate or estimation that once the booms are
2 set, I'm sure this varies by oils and conditions and so
3 forth, but just trying to get a rough approximation,
4 booms are set, submerged oils in that area underneath
5 the boomed area, how much of that is going to reemerge
6 and be captured by the boom? Ballpark.

7 THE WITNESS: Well, with these oils being
8 floaters, if you have some oil that ends up being
9 submerged, it will refloat. So at some point downriver
10 it will resurface.

11 So it's very typical. That's why typically
12 you're going to see multiple lines of boom, because
13 if -- of course, you're capturing them live and
14 typically you're putting your boom where it's going to
15 be most effective so where you have lower currents. But
16 even so, if some of the current has entrained some oil
17 and it will be resurfacing downriver, that's why you
18 have the sort of multiple boom sets.

19 MR. SNODGRASS: Just a couple questions also
20 about I guess what's happened in terms of the historical
21 record. In the Mississippi example, you mentioned there
22 was no containment.

23 Were there no plans in place or were there
24 plans that weren't properly implemented?

25 THE WITNESS: You know, it was a barge

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1 spill, so a collision happened with the barge. And so
2 there's clearly plans, and so the Coast Guard is
3 responding and the vessel is responding, but by the time
4 they got with the boom in place, it's a substantial
5 amount. The quantity that was reported spilled to the
6 river was already moving downriver. So the boom was put
7 around the barge to keep any additional release from
8 happening.

9 On the Yellowstone spill, that happened
10 mid-winter so there was an ice cover and areas of open
11 water, but a lot of ice, so it was impractical to
12 actually use boom in that case.

13 MR. SNODGRASS: The example of the mid-river
14 barge collision I think brings me to a couple other
15 questions. Most of the discussion today has been about
16 at the facility.

17 Can you talk a little bit about a mid --
18 what the recovery plans are for mid-river or offshore
19 collisions, groundings?

20 THE WITNESS: Well, certainly in a general
21 sense the response is going to be similar to what you
22 would do at a facility, just you're using a different
23 set of assets. I think the big difference, of course,
24 is that it's the vessel owner/operator that is the
25 responsible -- will be engaged as the responsible party.

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1 So they're going to be working with their contractors to
2 contain, recover, salvage the vessel.

3 Most of the vessels that work up and down
4 the Columbia River are signed up under the umbrella plan
5 that MFSA has, so that allows them to, the vessel master
6 makes a call, and MFSA and Clean Rivers Co-Op provides
7 an immediate response, including an incident commander
8 that will work with Coast Guard and work with the state
9 on-scene coordinator to identify priorities and the
10 response objectives.

11 But the point of having assets up and down
12 the river with the Co-Op is so that you have shortened
13 the time, the response time required to get from
14 where -- wherever the vessel may end up having an issue.
15 And so that distribution of assets up and down the river
16 really helps to shorten that time. And as I was saying,
17 what's critical is to be able to get to a spill site
18 quickly for that containment. So that's on the river.
19 Offshore, it's the same thing is going to apply. It's
20 just that now you're dealing with ocean-going
21 capability. So you have --

22 MR. SNODGRASS: Excuse me. By "offshore," I
23 just meant off, if not mid-river, somewhere within the
24 river channel, not at the facility.

25 THE WITNESS: Yeah.

TAYLOR

1 MR. SNODGRASS: Did the tabletop exercise
2 look at mid-river incidents?

3 THE WITNESS: Well, the tabletop exercise
4 that we did in January looked at the worst-case spill
5 for the facility. So it's taking the 380,000 barrels of
6 oil and putting it magically into the river and then
7 allowing it to go down. Some of that oil, when we look
8 downriver, we're looking at both sides of the river and
9 in midstream islands for where GRPs would be applicable.

10 So we're -- as these GRPs were being
11 implemented at 2, 4, 6, 8 hours, they're moving
12 downriver ahead of the leading edge of the -- of what
13 would be assumed a spill on both sides, Oregon and
14 Washington sides. Because we know that generally the
15 current is going to take it down, but until you know on
16 the day of a spill what the wind is doing and what the
17 actual currents are, you don't 100 percent know if it's
18 going to hug one bank or another bank. Wind will push
19 oil towards one bank, and so if you have prevailing
20 southerlies, it's going to tend to push it towards that
21 north bank most of the time, and that's where you're
22 going to see most of the oil.

23 So on the day of the spill, you're actually
24 doing overflights, so you can specifically see where the
25 oil is going and make sure your strategies are in place

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1 for that oil as it's actually tracking it.

2 MR. SNODGRASS: For purposes of response
3 planning or actual incidents in your experience, is it
4 fair to assume that for a collision or an allision or a
5 grounding, is it a single source of oil release or is
6 that a moving source? I would assume perhaps in a
7 grounding a single source and moving the other two
8 examples?

9 THE WITNESS: Yeah. Most of the vessel
10 incidents that I'm familiar with are a point, fixed
11 incident. I can only think of maybe one or two where it
12 was a moving source.

13 MR. SNODGRASS: Thank you.

14 THE WITNESS: Okay.

15 JUDGE NOBLE: Mr. Stone?

16 MR. STONE: Good afternoon, Dr. Taylor.

17 With respect to Columbia River assets for
18 spill control and response, this would be, for example,
19 a train accident spill where the tracks are adjacent to
20 the river, are those assets all delivered by water or
21 can those -- some of those assets have to be delivered
22 to the site by land?

23 THE WITNESS: In the case of what we looked
24 at for the exercise, there was a combination. Some
25 assets are being delivered by water. You have equipment

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1 sitting just on the other side of the river, so it's
2 just crossing the river. Some are being brought up by
3 boat along the river, and then others are being
4 trailered in. So you have quite a few assets that are
5 already packaged in trailers and brought on land. And I
6 know BNSF has some cache of equipment that's helicopter
7 ready, where you can actually pick it up and drop it
8 into a location via helicopter.

9 MR. STONE: So if the spill site is
10 inaccessible by land, i.e., no roads leading to it, how
11 would that affect the ability to respond and control the
12 spill?

13 THE WITNESS: Well, you would still be
14 mobilizing but you'd be mobilizing largely on water. Or
15 to the extent that you can bring in equipment via air
16 packages to somewhere where you can stage it safely,
17 then that would be the mode of getting assets to the
18 location. I would expect that what you would see is a
19 large on-land mobilization to the closest point where
20 that -- where you could prestage equipment and then move
21 it to the areas you needed.

22 Remember that there's a significant portion
23 of assets going to the actual spill location itself, but
24 there are also a large component of your assets are
25 going to protecting downstream resources. And so to the

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1 extent that they would have access and be able to deploy
2 to protect downstream locations, that would happen.

3 So it's really -- it's prestaging and
4 advancing your equipment to as far as possible as you
5 can and then using water resources to get it the rest of
6 the way. Or if it were rail, maybe you can bring in
7 also by rail.

8 MR. STONE: If the site was inaccessible by
9 land, by road, do you foresee that potentially a spill
10 response could be delayed in that situation?

11 THE WITNESS: Well, I don't think it's going
12 to be delayed. I think you're still going to see a
13 number of the same first actions taking place. It's
14 just going to take longer to get assets to the specific
15 spill site itself.

16 So that cascading of equipment to a specific
17 spill site might take a little bit longer because now
18 you're relying on that mobilization from land to water
19 and water to the spill site, if it's in a remote
20 inaccessible location. But you'd still be seeing
21 anything that you can do down river you'd be doing.

22 MR. STONE: Thank you.

23 THE WITNESS: Sure.

24 JUDGE NOBLE: Mr. Lynch?

25 MR. LYNCH: Good afternoon.

TAYLOR

1 THE WITNESS: Good afternoon.

2 MR. LYNCH: You gave some testimony earlier
3 regarding the Mosier, Oregon response, which happened in
4 the middle of the afternoon or early afternoon.

5 How would the response differ at all in your
6 mind if that happened at 2:00 in the morning?

7 THE WITNESS: Well, I think the -- I think
8 the immediate response, and that is always with an eye
9 towards safety, so now you're talking about people and
10 public and your responders, is still going to be a
11 priority. So that would still be happening. You'd
12 still be looking to evacuate the immediate surrounding
13 of the area.

14 As you probably recall, a big part of that
15 response was fire fighting. There were four cars that
16 were on fire, and so that would still take place.

17 Getting boom deployed at the mouth of the
18 stream, that is questionable. It's just because of the
19 safety aspect of putting people on the river at night.
20 If it was deemed that there was a way to do that safely,
21 it may have happened. More likely, you would have first
22 light, you would have everything ready to deploy at
23 first light when it was more safe to do so. But I think
24 generally you're looking at the same process with just
25 the challenge of darkness.

TAYLOR

1 MR. LYNCH: So the response -- I mean, just
2 forget about the fire at this point, but if there's an
3 incident at night, the response vessels come in don't
4 have big spotlights to identify where the oil is
5 starting to disperse or do you just wait until it gets
6 to be daytime?

7 THE WITNESS: No, no, no. It's mostly safe
8 operating conditions on water. And you can undertake a
9 number of safe operating operations on water. And a lot
10 of those vessels do have lights, by the way, so you can
11 illuminate and work at nighttime.

12 It's just sometimes some of the booming
13 aspects where you're working up against the shoreline
14 are considered a little more challenging, and so you
15 don't want to put people at risk for doing those type of
16 operations. But, for instance, on water containment,
17 you can certainly do.

18 One of the things that Ecology and the spill
19 community has in this area is ways to track oil on water
20 at night. You have an IR system on several of the
21 helicopters, the Sheriff's Department and others, that
22 is specifically for that reason, that you can use and
23 see where the bulk of oil might be moving and you can
24 move assets into those areas even though it's nighttime.

25 MR. LYNCH: On Paragraph 51 of your prefilled

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1 testimony, and this is a follow-up to a question asked
2 by I think Council Member Shafer, it says, "A spill of
3 dilbits to land or in contact with the river banks or
4 shorelines would have very limited penetration into sand
5 but could penetrate into pebble or coarser materials."

6 And you indicated that it's unlikely that it
7 would reach a red salmon nest or fish nest. But given
8 how these reds are constructed, does that sound like the
9 dilbit would penetrate a fish nest?

10 THE WITNESS: No. I'm talking about the
11 bank where you have open pour spaces, it's not water
12 saturated. So this is pebble cobbles and there's air,
13 it's exposed. And so if you bring a dilbit, for
14 instance, into that sort of setting, it would be able to
15 move through that -- through those pour spaces, and some
16 of it may be retained. Some of it may work its way out
17 also.

18 MR. LYNCH: So would you expect it would be
19 washing in and out of the bed or some of it be attaching
20 or --

21 THE WITNESS: Well, again, that's like the
22 river bank, the bank itself. So again, I'm not talking
23 about a place where you have submerged pebble cobble or
24 where you have saturated material, because oil will not
25 go into a saturated pour space.

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1 But this is where you are along the bank
2 itself. So if you've got like along the park or at a
3 ramp and you've got pebble armoring and cobble armoring,
4 riprap that protects that ramp, so then dilbit could
5 penetrate into that available pour space, and some of it
6 sit there and some of it may wash out as you have slight
7 changes in the water levels on the river.

8 MR. LYNCH: I see what you're saying.

9 One of the things, one area I keep thinking
10 about in terms of spills is like the White Salmon River
11 area because you've got major tributary coming into the
12 Columbia. You've got listed fish species there. You've
13 got -- let's say you've got spring runoff, so you've got
14 volume of water coming in, presumably a fair amount of
15 sediment, you're mixing into the Columbia, right around
16 there.

17 I guess are those sorts of conditions where
18 you would expect to see more sinking or submerging of
19 oil?

20 THE WITNESS: Well, that higher energy and
21 the higher sediment load could lead to more oil
22 depositing or becoming submerged in the water column
23 than relative to what you would see on the Columbia
24 itself. But again, I'm only talking about a very small
25 proportion of oil.

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1 The vast majority of the oil would be on the
2 surface temporarily entrained. Particularly if you have
3 high turbulence, then you can expect some of it is going
4 to be temporarily entrained. But then once it enters
5 into the Columbia River where you can spread and you
6 have an overall slower current and slower turbulence,
7 then you'll see that refloating.

8 MR. LYNCH: Is it your understanding that --
9 I know you just might have an understanding about this,
10 but is it an understanding that migrating juvenile fish
11 tend to stay along the shoreline?

12 THE WITNESS: I know some species do. They
13 like the shoreline or they like the banks, midstream
14 banks.

15 MR. LYNCH: Okay. Thank you.

16 THE WITNESS: Sure.

17 JUDGE NOBLE: Any questions to my left?

18 Mr. Siemann? Is that you?

19 MR. SIEMANN: Yes. Good afternoon. Thanks
20 for being here today. So I have a few questions.

21 The first, given that you've worked on the
22 Exxon Valdez and the BP Deep Water Horizon spills, I'm
23 just curious, how does the oil in those spills compare
24 with the Bakken and dilbit in terms of API and potential
25 for OPA?

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1 THE WITNESS: Well, you have a medium crude
2 in the case of the Exxon Valdez. I can't tell you
3 exactly what the API is, but it's "innered" it's between
4 those two, and maybe a little bit towards the heavier
5 end than the oil that happened with the Deep Water
6 Horizon was a light crude. And so that's -- it's still
7 within the range between the dilbit and the Bakken, but
8 it's in the 30 area API, and the Exxon Valdez is in the
9 20-something range, upper 20s.

10 But the same processes happen that we're
11 talking about, spreading on water, some loss through
12 evaporation, contact with the shorelines. You know, one
13 interesting case is that even with the light crude that
14 we had on the Deep Water Horizon, we had some settling
15 into the near shore. That wave action picked up sand,
16 and that turbulence, with the oil, ended up forming a
17 mixture that was heavier than seawater and so it
18 deposited right near the shoreline and bars and stuff.

19 So even the light crude could, given the
20 right conditions, some of that could go -- now that,
21 again, this is a very small quantity relative to the
22 spill in general.

23 There are very little -- there are a few
24 studies that looked at potential sunken oil off the
25 beaches of Prince William Sound, and there, probably

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1 what happened is the same sort of aspect, where you had
2 once that oil had deposited on the beach, it got mixed
3 with maybe a little bit of sediment and then through
4 natural offshore transport maybe some of it made its way
5 just immediately off the beach. But again, these are
6 very, very small proportions of the spill itself. I
7 mean very small.

8 MR. SIEMANN: In terms of -- I want to ask a
9 completely different question about prebooming, which
10 was a long time ago in your testimony now.

11 THE WITNESS: Uh-huh.

12 MR. SIEMANN: We talked about conditions
13 that would make it unsafe for prebooming to occur based
14 on current and wind speed and other factors.

15 Do you have any sense of what the frequency
16 or the percent of time that those conditions are
17 present?

18 THE WITNESS: Well, I mean, frankly, that
19 has to be done every time that a transfer is going to
20 happen. You need to actually gauge the conditions at
21 the site.

22 I mean, I've done a ton of training of
23 people on how to deploy boom in rivers and currents.
24 The first thing I do, I say, okay, go pick a point. I'm
25 going to tell you to go a hundred meters down the

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1 shoreline. I want you to stand there, and when I give
2 you a signal, you drop this piece of wood into the water
3 and I'm going to time how long it takes it to come down
4 to me. And I can figure out, I've got length, time,
5 I've got speed. And I can tell you within minutes what
6 the actual current is.

7 So there's no reason why you wouldn't be
8 doing something like that or just simply have a current
9 meter, an actual instrument, you know, on the dock face
10 that's constantly measuring the current that tells you
11 exactly what the conditions are. So I wouldn't try to
12 venture.

13 I know from looking at the information that
14 is available through the NOAA river monitoring and
15 through the USGS flow stations that these averages are
16 at right around a knot. And so that's well within the
17 threshold that has been established at 1 1/2 knots.

18 So what I'm seeing is on average, in
19 general, you will be booming. And it would take --
20 require actually gauging and saying, well, no, we've got
21 currents that are clearly exceeding that velocity to
22 say, okay, well, the current's now exceed, we're not
23 going to preboom. We'll do everything else. We've got
24 all the staged equipment, we've got a boat in the water,
25 but we're not going to actually put the boom around the

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1 vessel.

2 And when that happens you make note of that
3 in your transfer operation and you notify Ecology.
4 We've got a transfer operation with these kind of
5 currents or any other condition that may have, as we're
6 talking about, that may have been exceeding a safe and
7 effective threshold.

8 MR. SIEMANN: What I'm trying to get at here
9 is what portion of time that oil transfer will occur
10 where there is not prebooming because the prebooming --
11 conditions for prebooming are not present. So that's
12 what I'm trying to get at exactly.

13 THE WITNESS: Yeah. Again, from looking at
14 the information on the currents and the prevailing
15 weather conditions, I don't think you're going to see
16 those exceedances that often. I think the vast majority
17 of the time you will preboom.

18 And it's my understanding even from I think
19 Mr. Haugstad's testimony the other day, from the
20 facility that's only a half a mile upriver, is that the
21 prebooming is generally the norm. And it's the rare
22 case where you can't preboom.

23 MR. SIEMANN: Right. So are there ways of
24 getting that information of the number of times where
25 conditions exceed safe and effective prebooming

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1 conditions? I understand that the average, and as you
2 described, is not that case, but is there a way of
3 actually getting that data?

4 THE WITNESS: Well, you could historically
5 go to sites on the river where prebooming -- or where
6 the transfer is happening, because they would be keeping
7 a record of that, ever since the prebooming regulations
8 came into effect. So there's going to be a record of
9 the number of times that a transfer did not entail
10 prebooming because, again, there's an obligation to have
11 that on file and file that with Ecology.

12 And you can put a weather station in and put
13 a current meter in at the facility itself to get very
14 specific site details, and you can measure those over
15 the course of a year and find out, well, in 2015 we had,
16 you know, X moments of exceedances. But that would
17 require doing instrumentation and then having its
18 monitoring at the site itself.

19 MR. SIEMANN: And you mentioned a current
20 monitor as opposed to throwing a piece of wood in the
21 water. Do you know if Vancouver Energy intends to have
22 a current monitor?

23 THE WITNESS: I know it's something that's
24 discussed. I don't know if they've committed to that.
25 But I know that is something that was certainly

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1 discussed.

2 MR. SIEMANN: I want to turn to the
3 tabletop -- well, I'm not sure if it's the tabletop
4 exercise, but the stochastic model that was mentioned
5 that used a hundred different examples of oil floating
6 down the river.

7 And do you recall what, in terms of the most
8 extreme case, how far the oil traveled downriver in
9 those hundred --

10 THE WITNESS: First of all, I was not part
11 of the tabletop exercise. That was done for a very
12 different purpose. But I can't recall per se what the
13 furthest extent was. They typically will limit the
14 model to observable oil on water, so that would be your
15 sheens. And I don't think the sheens exited the river.
16 It's all within the river itself. And but I'd have to
17 actually go back and look at a much better diagram than
18 I have from their report to be able to tell you just how
19 far that reached.

20 MR. SIEMANN: Okay. If I understand
21 correctly, booms in the cleanup does not capture
22 100 percent of the oil. Some is evaporated, and there's
23 been some number of 10 percent and so there is some
24 portion that is lost, which it's been suggested maybe as
25 much as 50 percent remains in the river.

TAYLOR

1 What happens to that oil?

2 THE WITNESS: Well, again, that 10 percent
3 number that's floating around, that was intended to look
4 at the waste stream, so let's just slide that over there
5 because that's not really what we think of when we think
6 about booming and particularly prebooming. Prebooming
7 means that we intend to capture everything. That's the
8 whole point of prebooming is that you will contain and
9 collect everything.

10 If you recall, I mentioned earlier that when
11 a lot of the modeling where we talked about evaporation
12 and everything, that's uncontained, so that's oil that's
13 spreading and naturally evaporating. That happens
14 faster when it's not contained.

15 When it's contained, it slows that process
16 down because the oil now has a certain thickness so you
17 don't have the quick evaporative loss that you have when
18 it spreads out. So right away your capability to
19 recover is going way up, not only because you've got it
20 contained, but also because you have even less of a loss
21 through the evaporation.

22 But I'll be the first one to tell you boom
23 is not 100 percent going to work every single time. You
24 put boom out, you can expect some oil is going to get
25 around the boom and it's going to leak in some places.

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1 So that's why you put a whole series of cascading set of
2 booms in place so that if something is getting
3 entrained, if something is moving past your boom, you
4 must have another set and another set. Each successive
5 set is adding to your success.

6 And then, of course, critically is that you
7 need to recover that oil. You don't just let it sit
8 there, but you actually are pumping it and removing it
9 off the water. So as soon as you start to set boom for
10 containment collection, you need to be skimming that oil
11 and collecting it. And now you are removing a
12 substantial portion of your spill.

13 What happens to the portion that perhaps is
14 just naturally dispersed in the water column, small
15 droplets that are in the water column? They'll get
16 transported downstream. If the turbulence starts to
17 subside, this is what re-floats to the surface. Same
18 thing with oil that's entrained. As it moves downstream
19 where the current's lessened, it will start to
20 resurface.

21 And then, of course, you've got shoreline
22 and river banks, and so if some of it touches the river
23 banks or shoreline, some of it is going to stick and
24 adhere to that surface or get into the pour spaces and
25 some of it will stay there. So there's a lot of

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1 different pathways.

2 Ultimately, your oil is getting biodegraded.
3 Ultimately, the things that are destroying the
4 hydrocarbons is biodegradation, photooxidation, which is
5 solar breakdown, is really what is happening over given
6 enough time, what's happening to the oil that's not
7 recovered.

8 MR. SIEMANN: So if oil does escape and ends
9 up in marshes or estuaries or wetlands, what is the
10 effect -- I don't know if you can answer this, but what
11 is the effect on that vegetation and on those
12 ecosystems?

13 THE WITNESS: Again, it's so wholly
14 dependent on the actual conditions and circumstances of
15 the oiling, the water levels in the marsh, the time of
16 year, the marsh use, the species that are present.
17 There are so many variables, I wouldn't even try to
18 really kind of get into that side of things.

19 I know a colleague of mine will be talking
20 about effects later, but one thing I will say about
21 marshes and vegetative shoreline, what we see very often
22 is what we call marginal oiling, so you get a fringe oil
23 event, and that vegetation is kind of -- it's a poor
24 boom, very poor, ineffective boom, but it ends up
25 collecting and really slowing down and retarding the

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1 oil. So very often what will happen is you end up with
2 some fringe oiling but you don't see oiling go way back
3 into a marsh. That's very, very unusual. And
4 particularly as the oil weathers. If it's a very light
5 oil, then it has the ability to move a little bit more
6 with the water. But once it starts to weather and
7 gets -- becomes more viscous, it really doesn't
8 penetrate into the marsh.

9 And oil on vegetation, typically it'll --
10 you might get a yellowing and some of the leaves and
11 some of the vegetation effect, but if the root system
12 hasn't been damaged and the root system is intact, then
13 you very often see regrowth within a year.

14 MR. SIEMANN: And so assuming that oil does
15 get into vegetation and marshes and ecosystems, is there
16 kind of a protocol for that cleanup, and does that
17 cleanup, what is the effect of the cleanup on those
18 systems?

19 THE WITNESS: Well, I wasn't going to
20 mention this other one that's in here, but there's
21 another exhibit in here which is actually the API guide
22 for cleanup of oil in marshes and wetlands. And again,
23 that was just issued last year as sort of an update to
24 previous guides and from lessons learned from Deep Water
25 Horizon.

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1 And the bottom line is, in marshes typically
2 you're going to limit your cleanup to just the real
3 heavy concentrations of oil. If there's anything from
4 sort of a moderate to light oiling, and this is very
5 standard terminology that we use when we characterize
6 oil stranded on shoreline, but if it's moderately or
7 less oil, typically we're going to let that weather in
8 place. We'll monitor it.

9 You may do some passive things like apply a
10 natural sorbent to it so it's not sticky and there will
11 be less contact risk for birds that are using the marsh.
12 But your focus is going to be just on those areas where
13 you have the heaviest oil. And here, the bottom line is
14 you're going to pull that out and take that out in a
15 very careful way without damaging, again, trying to
16 avoid any damage to the root system and allow it to
17 regrow. But the lessons learned in marshes is that we
18 have to be ginger with how aggressive you are with your
19 treatment.

20 MR. SIEMANN: Two more questions.

21 One, so we talked a little bit about the
22 Mosier spill, and we talked -- we focused primarily on
23 the effect of the oil entering or almost entering the
24 Columbia River.

25 What about the creek; what was the effect of

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1 the oil on the creek? Do you have any knowledge of
2 that?

3 THE WITNESS: Only the sheen. I think most
4 of that oil ended up being caught up in the wastewater
5 treatment plant and so it was some of the outflow from
6 that is what led to the sheen in the creek.

7 No recoverable oil, no sort of skimming or
8 vacuuming or anything like that from the creek itself.
9 And I know that groundwater was monitored. There are
10 drawings, daily samples from groundwater, and then it
11 went to weekly and there were no effects in the
12 groundwater either.

13 MR. SIEMANN: And lastly, you mentioned that
14 the Canadian study heated the oil to 80 degrees Celsius;
15 right? And I recall that the Vancouver Energy Terminal
16 will heat the dilbit to support flow through the pipes.

17 Do you know what the temperature of that
18 heating is?

19 THE WITNESS: No, I don't. I know it was --
20 there were one or two lines, I think, that were going to
21 be heated for that transfer. The big difference is in
22 the lab studies you're heating it to evaporate, to cause
23 the loss of those volatiles.

24 In these lines where it's being heated to I
25 don't know what temperature, it's not to evaporate.

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1 There is no loss of any light ends, because it's
2 confined and contained. So all you're doing is reducing
3 viscosity. You don't actually -- you're not driving off
4 the light ends.

5 MR. SIEMANN: So it really wouldn't be
6 comparable?

7 THE WITNESS: Not comparable, no.

8 MR. SIEMANN: Thanks very much.

9 THE WITNESS: Sure.

10 JUDGE NOBLE: Any questions to my left?

11 Mr. Moss.

12 MR. MOSS: Don't want to prolong your stay
13 on the stand too much, Dr. Taylor, but one of the things
14 that's striking to me, you have 27 years of experience
15 in this field. Clearly, you seem well-versed in the
16 subject matter.

17 But turning to specifically to the subject
18 of dilbit, that's a fairly recent development, isn't it?
19 We haven't been studying that type of oil for very long,
20 have we?

21 THE WITNESS: Surprisingly, and many people
22 don't know this, but dilbit has been exported via
23 Vancouver Harbor for over 30 years.

24 MR. MOSS: Okay. So perhaps --

25 THE WITNESS: It's a commodity that's been

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1 in pipelines and in vessels for a long time. There's a
2 heightened awareness of it being a product now with
3 expansion projects and proposals, and so there has been
4 a lot of attention saying, okay, well, let's
5 characterize this. But there were a few studies done
6 back in even the late '70s with dilbit, and then there's
7 been a whole progression of studies even more recently
8 looking at it.

9 MR. MOSS: I'm noticing that looking at the
10 exhibits, a lot of them are dated in 2016. It seems
11 these studies seem to be a lot more focused on this
12 particular subject at this time than perhaps in the
13 past.

14 THE WITNESS: Yeah. I think -- well, I know
15 the work we did, because I've been involved in a couple
16 other hearings up in Canada on this subject, and so I've
17 been engaged and looking at this for a while, but we
18 conducted some of the tank tests ourselves up in
19 Alberta, and we put cold lake dilbit on tanks and we
20 applied wind and wave action, and then we did a whole
21 series of monitoring to look at the density changes and
22 hydrocarbons in the water column.

23 And that sort of was like -- that was in
24 2014, Environment Canada report was in 2014. And a lot
25 of that was -- the impetus for a lot of that were these

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1 applications that were happening up in Canada for the
2 proposed expansion projects up there. And then there's
3 been a whole slew of work looking not only at dilbit,
4 but also Bakken, because of the sort of the new volumes
5 and the new oils.

6 The biggest thing in my mind is these two
7 oils still fall within that range of hydrocarbons that
8 we work with anyway. So when I hear that this is
9 something unusual, something we don't know about, we've
10 been dealing with everything from asphalt to gasolines
11 for many, many years. And these are intermediate. So
12 nothing new.

13 MR. MOSS: I'm just trying to get my mind a
14 little better around how to evaluate things, such as the
15 National Academy of Sciences study that makes references
16 on a number of different subjects. Just happened to
17 turn to the page here on toxicity of diluted bitumen.

18 And it says, "A large fraction of diluted
19 bitumen consists of an array of currently
20 uncharacterized chemicals. This situation is not unique
21 to diluted bitumen and applies to other crude oils.
22 However, diluted bitumen has a larger number of unknown
23 polar compounds," and I don't know what those are. But
24 it goes on to talk about the uncertainties. And the
25 report has a number of different subject matters, it

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1 talks about that. So there's still a lot to learn, I
2 gather.

3 THE WITNESS: There's continued ongoing
4 characterization of the different products. You have
5 different sources of bitumen that is used for the oil
6 sand products. They come from different sources and
7 they have different hydrocarbon characteristics. And
8 then there's different blending approaches also for
9 creating and exporting grade crude.

10 So one of the things -- there's a Crude
11 Monitor is a website that has a lot of information about
12 those crudes and their characteristics. And what
13 they'll do is they'll get batches and samples and
14 they'll run them, and it's publicly available and you
15 can look it up. And they give that sort of basic
16 characteristics.

17 But when it goes to the detail of these --
18 some of the polar compounds or some of the unresolved
19 hydrocarbons, that applies to a lot of crudes, and
20 people are still trying to get to understanding these
21 mid-range and other range hydrocarbons and their
22 contents in crude oils.

23 MR. MOSS: Thank you for giving me that
24 context.

25 THE WITNESS: Sure.

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1 JUDGE NOBLE: Are there any other questions?

2 I know Mr. Lynch has a correction.

3 Mr. Lynch?

4 MR. LYNCH: Thank you.

5 This isn't a question, but in my earlier
6 question to Dr. Taylor, I mentioned the White River and
7 I meant to say the Klickitat River. So if you look at a
8 map, I was only off by 6 or 7 inches. (Laughter.)

9 MR. PAULSON: I have one point of
10 clarification.

11 JUDGE NOBLE: Mr. Paulson?

12 MR. PAULSON: Just quickly, just
13 clarification, Dr. Taylor.

14 When you say Vancouver Harbor, I assume you
15 mean Vancouver, British Columbia?

16 THE WITNESS: Yes, sir. Good point.

17 JUDGE NOBLE: This is time for counsel
18 questions based -- excuse me, questions based on council
19 questions, but our poor court reporter is falling off
20 her chair, I think. And so I would ask, are there going
21 to be a lot of questions based on council questions?

22 MS. BOYLES: I have two.

23 JUDGE NOBLE: And you, Mr. Kisielius? You
24 don't have many either, do you?

25 MR. KISIELIUS: Actually, it might depend on

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1 the questions forthcoming, but I don't anticipate having
2 any at all.

3 JUDGE NOBLE: Let's give it a try then.

4 RECROSS-EXAMINATION

5 BY MS. BOYLES:

6 Q. I want to nail down this 10 percent number that
7 Mr. Siemann talked about as far as what's recoverable,
8 because you told me earlier that the 10 percent was
9 referring to Tesoro Savage's own spill response
10 documents. And in those spill response documents, the
11 reference to 10 percent is as recovery.

12 So when you say storage capacity or waste
13 stream, where are you getting that number?

14 A. I'm not getting -- that number, the 10 percent,
15 is in that discussion about what would happen with the
16 waste stream.

17 So in that discussion, they're saying if we
18 assumed that 10 percent of the oil is recovered, then we
19 have X barrels of liquid waste that will have to be
20 processed through oil water separation and stored in
21 tanks. So that's where that discussion is.

22 I'm not saying that 10 percent is the target
23 recovery by any means. As a matter of fact, target
24 recovery should be well over that. They should be --
25 the target recovery should be almost 100 percent.

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1 That's almost impossible to achieve, but it should be
2 way up there.

3 **Q. So there's an additional amount of target**
4 **recovery that the planning documents don't identify?**

5 A. That particular section as written in that
6 contingency plan does not.

7 **Q. Thank you.**

8 A. But if you look at the storage capacity that we
9 identified from the worst-case spill exercise, that
10 certainly does address the total storage capacity.

11 **Q. And my last question, though that was two. I'm**
12 **sorry, three.**

13 **My last question is about the National Academy**
14 **report. Again, in contrast to the polar particulates**
15 **that Mr. Moss was talking about, is it correct that that**
16 **report also said that regulations and agency practices**
17 **writ large do not take into account the unique**
18 **properties of dilbit?**

19 A. Are you quoting?

20 **Q. I'm paraphrasing, but it's Page 4 if you want to**
21 **look at it.**

22 A. It has certain aspects that make it different,
23 behave in early stages of weathering because it has a
24 very quick loss of light ends. And I think that's about
25 it.

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1 MS. BOYLES: Thank you.

2 JUDGE NOBLE: Does that make you think up
3 any questions, Mr. Kisielius?

4 MR. KISIELIUS: It doesn't. I was just
5 going to point out for the council's reference that
6 Dr. Taylor referred to, in response to Mr. Siemann's
7 question, a report that is Exhibit 277, just for the
8 record.

9 But I don't have any questions for
10 Dr. Taylor.

11 JUDGE NOBLE: It's about time for our
12 afternoon recess.

13 Dr. Taylor, thank you very much for your
14 testimony. You are excused as a witness.

15 THE WITNESS: Thank you.

16 JUDGE NOBLE: We are off the record.

17 (Recess taken from 2:57 p.m. to 3:25 p.m.)

18 JUDGE NOBLE: Back on the record.

19 MR. JOHNSON: The applicant calls Greg
20 Challenger.

21 JUDGE NOBLE: Mr. Challenger, would you
22 raise your right hand, please.

23 GREG CHALLENGER,

24 having been first duly sworn, testified as follows:

25 JUDGE NOBLE: You may proceed, Mr. Johnson.

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DIRECT EXAMINATION

1
2 BY MR. JOHNSON:

3 Q. Mr. Challenger, can you state your full name for
4 the record and then spell it, please.

5 A. Yes. My name is Greg Challenger. G-r-e-g,
6 C-h-a-l-l-e-n-g-e-r.

7 Q. All right. Thank you.

8 And, Mr. Challenger, you provided prefiled
9 testimony in this case; is that right?

10 A. Yes.

11 Q. Okay. And just for your reference, there's a
12 large notebook in front of you that contains your
13 prefiled testimony, some other exhibits, testimony of
14 others in this case that we might be referring to
15 throughout your testimony today.

16 And a copy of your CV was attached to your
17 prefiled testimony; is that right?

18 A. Yes.

19 MR. JOHNSON: And for the council's
20 information, that is Exhibit 0296. That's a TSS
21 exhibit.

22 BY MR. JOHNSON:

23 Q. And can you just briefly describe what your role
24 in this -- the Tesoro Savage Vancouver Energy project
25 has been?

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1 A. Sure. I've been asked to look at potential
2 environmental natural resource impacts from a number of
3 scenarios; facility, rail, and vessel on the river, and
4 to evaluate some of the opinions and statements of
5 others in that regard as well. And I've reviewed some
6 other testimony in that regard.

7 Q. All right. Thank you.

8 And were you present in the hearing room today
9 when Dr. Taylor testified?

10 A. Yes, I was.

11 Q. And did you hear his testimony about generally
12 different types of oil that may be processed or
13 transferred at the Vancouver Energy Terminal?

14 A. Yes.

15 Q. And did you hear his general descriptions of the
16 fate and behavior of those types of oils?

17 A. Yes.

18 Q. And do you generally agree with Dr. Taylor's
19 explanation of the fate and behavior of those types of
20 oils?

21 A. I do.

22 Q. And I'm specifically referring to what's been
23 commonly referred to as dilbit and Bakken crude; is that
24 right?

25 A. Yes.

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1 Q. Okay. Now, you just said that your
2 responsibility is to assess the impacts of a spill event
3 related to the Vancouver Energy Terminal; is that
4 correct?

5 A. Yes.

6 Q. Okay. And when you assess the likely impact of
7 a spill, what is it you're assessing? What are you
8 looking at?

9 A. Well, you're looking at the, as you mentioned,
10 the fate and behavior aspects that Dr. Taylor discussed
11 and then the potential exposure to natural resources,
12 which could include things from human use to fish to
13 birds to mammals, and not only the exposure because,
14 exposure is not injury, but what might happen after,
15 following that exposure, which would be possible injury.

16 Q. In assessing those kinds of impacts, did you use
17 the same worst-case discharge scenario that Dr. Taylor
18 referred to?

19 A. Yes.

20 Q. Can you just generally describe from the
21 perspective of impacts, if that worst-case discharge
22 were to occur, what the general impacts on the river
23 would be in terms of oil impacts?

24 A. Well, that's a big question, but it's -- I think
25 others have described it and I have a lot agreement with

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1 a lot of what's out there. A worst-case discharge would
2 put a substantial quantity of oil in the river, and much
3 like the Mobil Oil spill, that oil moves downriver and a
4 lot of it might become unrecoverable. It might get out
5 to sea, it might widely disperse.

6 Now, typically how oil moves in a river, as
7 opposed to in the ocean, obviously it's moving
8 downstream. And I think all the experts agreed that
9 this pulse of water quality effects, et cetera, would be
10 short-term.

11 The other thing that is different about a river
12 as opposed to, say, Prince William Sound, for example,
13 is the sound has very high tidal range and that oil is
14 going back and forth, up into the cobble, down into the
15 cobble. In the river, it's headed out and it creates
16 more of a stripe; what we call a bathtub ring in the
17 industry. If you don't have a lot of water level
18 fluctuation, that could be a fairly narrow band of
19 oiling.

20 **Q. I'm sorry. I'm just going to interrupt for a**
21 **minute.**

22 MR. JOHNSON: Your Honor, I mean, the music
23 is getting louder.

24 JUDGE NOBLE: I have already asked them to
25 go and talk to somebody.

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1 MR. JOHNSON: Can everybody bear with that?
2 We'd like to keep moving but it's pretty distracting.

3 JUDGE NOBLE: We are trying to bear with it.
4 Anyone should let me know if they really can't hear.
5 And we'll see if we can get everybody to speak really
6 loud.

7 MR. JOHNSON: All right. Mr. Challenger,
8 yes, so I would ask go ahead and speak loud into your
9 mic. And also, just, we're working with the court
10 reporter, so keep the pace down because she's got to
11 transcribe everything you're saying. So I'm sorry, I
12 interrupted.

13 BY MR. JOHNSON:

14 **Q. You were talking about the flow of oil in a**
15 **river as opposed to, say, on the ocean.**

16 A. Sure. Obviously ocean has currents, et cetera,
17 but the tides will affect the oil differently. I
18 understand that the Lower Columbia River has tides, but
19 not quite like your large tides in something like the
20 Prince William Sound.

21 So the oil is moving sort of unidirectionally,
22 and generally things that travel in the current will
23 move with what's called the thalweg, t-h-a-l-w-e-g.
24 That's sort of the deep chunk of the river where most
25 the velocity is happening.

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1 Unless wind blows it ashore, et cetera, you'll
2 get a lot of the oil just moving down that thalweg.
3 There are depositional places where you find debris
4 collects. That's where we also look for oil as well.
5 And then there are places where it's just deflected or
6 refracted or keeps moving out the river.

7 So as in the Mobil Oil spill, which was
8 referenced earlier, and the NOAA report, the shorelines
9 were not reported to be oil throughout. They were
10 spotty and sparse, and that's kind of what you would
11 expect. There would be some heavy oiling, and that's a
12 term of art in oil spill.

13 After the Exxon Valdez, a systematic framework
14 of assessing oil on the shorelines was developed. It's
15 conducted with government -- federal personnel, state
16 personnel, biologists, responsible party scientists so
17 that we all agree on the same picture of the oil on
18 shorelines. And its main purpose is to give the
19 response and operations priorities, because obviously in
20 the Valdez, everybody came back and said it's really
21 heavy. And so where does operations begin?

22 So this is a -- the heavy, moderate, light, very
23 light, trace oiling are terms of art. And in general,
24 when you have an oil spill -- well, not in general,
25 almost universally when you have an oil spill, most of

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1 the oiling is very light.

2 There may be many miles oil could be very light
3 or light, but typically the categories with the least
4 miles would be heavy, and that includes in the big
5 spills like Deep Water Horizon. I was a SCAT
6 coordinator on that spill, that a very small percentage
7 of the shorelines end up with heavy classification. And
8 that would more than likely be the case even in a
9 worst-case discharge here. You might get exposure
10 throughout the river, a lot of which would be very
11 lightly oil, trace oiling, moderately oil, and some of
12 it would be heavy.

13 **Q. So given the variation of oiling from heavy to**
14 **light and the flow down the river, would there be oil**
15 **bank to bank, so to speak?**

16 A. No, there would not. Very unlikely you would
17 have oil bank to bank, both sides all the way down.
18 Certainly in a heavy category, no.

19 **Q. When you assess impacts related to oil spills on**
20 **the environment, do you consider or take into account**
21 **the response actions and containment that Dr. Taylor was**
22 **referencing during his testimony?**

23 A. I would say we consider it, but as always, plan
24 for the worst, hope for the best.

25 **Q. So when you were doing your work here that's**

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1 reflected in your prefiled testimony and your testimony
2 today, did you assume any capture as a result of those
3 processes?

4 A. I did not, generally.

5 Q. I'd like to turn your attention now to your
6 assessment of impacts of oil spills. And earlier you
7 alluded to having reviewed some testimony of some other
8 witnesses.

9 Did you have an opportunity to review testimony
10 of James Holmes and Eric English?

11 A. Yes, I did.

12 Q. Okay. And did you have an opportunity to review
13 the Abt report that was appended to Mr. Holmes's
14 testimony?

15 A. Yes, I did.

16 Q. Okay.

17 MR. JOHNSON: And for the council's
18 reference or for your reference, the Tab 31 includes
19 Mr. Holmes's testimony; in Tab 33, Mr. English's, if you
20 need to reference it.

21 And for the council's reference this Abt is
22 included in Exhibit 1503. That's an ENB exhibit.

23 BY MR. JOHNSON:

24 Q. Mr. Holmes assumes that the entire river
25 downstream from the terminal would be heavily oiled from

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1 the spill. Do you agree?

2 A. I don't agree with that, no.

3 **Q. And is that based on your prior description of**
4 **the variation of the oil in the river?**

5 A. Yes, my experience in many oil spills.

6 **Q. And in terms of impacts to habitats and**
7 **shoreline, again, would you expect those to be affected**
8 **greatly by a lightly oiled area or a heavily oiled area?**

9 A. The greatest impacts would be in the heavily
10 oiled area.

11 **Q. And again, in terms of heavy versus light, if**
12 **there were a spill, the worst-case scenario, what would**
13 **your expectation be?**

14 A. My expectation there would be a number of --
15 it's hard to hypothesize, but there would be a number of
16 river miles that would probably be heavily oiled and
17 would experience adverse effects for a period of time,
18 and there would be a number of river miles that would be
19 lightly oiled and would be difficult for scientists to
20 detect any measurable or observable changes in a lot of
21 those habitats.

22 **Q. There was also some testimony earlier about**
23 **dispersion and dissolution of oil. And Dr. Holmes**
24 **relays -- I'm sorry, relies on some of those principles.**

25 **Is that important as part of your impacts**

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1 analysis?

2 A. In terms of reviewing the Abt report, understand
3 that this was an assessment of damages which is dollars,
4 not ecological injury, damages just means dollars, but
5 also understanding that the report makes some very
6 simplifying assumptions, for instance, that all the
7 river banks would be oil from bank to bank and there
8 would be a service loss, fairly substantial, 90 percent
9 in the reach from shoreline to shoreline across the
10 bottom, we wouldn't -- I don't believe we would see
11 that. Also, I believe the report was being conservative
12 in its concentrations of oil that it predicted effects.

13 It says it looked at the dispersed quantity of
14 oil, assuming that was all dissolved, came up with a
15 concentration of dispersed oil and the volume of water.
16 A lot of that oil would be particulate. It would also
17 be distributed in a patchy way.

18 Understand the need for simplistic assumptions
19 and conservatism when you're estimating dollars, but
20 that likely wouldn't be a realistic scenario. There's a
21 lot of dispersed oil that's not dissolved.

22 **Q. Okay. In terms of shorelines and impact to**
23 **shorelines, do you have an opinion about the time it**
24 **takes for a shoreline to recover from a spill such as**
25 **the worst-case discharge?**

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1 A. In the literature and from our experience and
2 studying a lot of oil spills, there's a wide range of
3 how long impacts might last. In general, one to two
4 growing seasons is the predominant recovery for
5 vegetated shorelines, marsh.

6 There's a paper by Jackie Michel and Nicolle
7 Rutherford, 2014, that reviews -- (Court Reporter
8 interruption.) Michel and Rutherford, 2014, that
9 reviews oil spill recovery periods for vegetated
10 shorelines and marsh. The finding being, of course, if
11 oil spills that occurred like the Gulf War where there's
12 no response action or the Metula in 1970 in Chile where
13 the oil was left, those take a long time to recover.

14 In general, if the oil -- if there's a response
15 action being flushing the oil out or replanting the
16 vegetation in the most aggressive instances, these
17 wetlands typically recover in one to two growing seasons
18 on average or less than five years in that paper.

19 **Q. Okay. And there's also been some testimony and**
20 **questions about how far oil may spread down the river,**
21 **if you will.**

22 **Does that have a relationship to the impact on**
23 **the environment?**

24 A. It could. As oil currents are at a high
25 velocity when an incident might occur, you could get oil

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1 spreading great distances. Now, this does represent a
2 response challenge to pick it all up. But at the same
3 time it also -- and it also may expose a greater
4 geographical area to oil, but at much reduced
5 concentrations.

6 For instance, in 2011 Silvertip Pipeline spill
7 in the Yellowstone River, Billings, it was during spring
8 melt. Very high flow in the river, very sediment-laden
9 water. The oil, there was small bits of oil discovered
10 pretty far downstream, but very small bits. It was very
11 hard to come up with oil to clean in that instance.

12 So difficult to pick up the oil and remove it
13 from the environment, but when it's spreading out, which
14 is kind of a purpose of a dispersant, what happens is it
15 makes more of the surface area of the oil available to
16 the environment for weathering, photo-degradation,
17 biodegradation, sedimentation.

18 All of those things actually would reduce the
19 impacts, as opposed to a very concentrated bunch of oil.
20 There would be a smaller area, more impacts, greater
21 area, less severe.

22 **Q. And I'm going to move on to specifics species**
23 **like fish here in a moment, but since you referenced the**
24 **Yellowstone River event, what were the ecological**
25 **impacts there?**

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1 A. I don't believe that natural resource damage
2 assessment is complete, but I recall the water samples
3 were unable to detect PAHs because of the rapid flow and
4 the movement. And so I don't know how the assessment
5 came out, but I would venture to guess it would be
6 difficult to measure or observe adverse effects on any
7 kind of scale.

8 **Q. And that's based on your understanding of the**
9 **water sampling?**

10 A. Yes.

11 MR. JOHNSON: Ms. Mastro, can you pull up
12 Exhibit 108, please?

13 BY MR. JOHNSON:

14 **Q. A minute ago you were talking about recovery**
15 **time, and -- have to pull up an exhibit. Here we go.**
16 **Now, you're going to have to turn around, unfortunately,**
17 **to see this exhibit, I think. Probably easiest, unless**
18 **you can find it there in front of you. Do you have it**
19 **there?**

20 A. Yes.

21 **Q. Can you just describe what this shows?**

22 A. It just shows, it's a meta analysis, meaning the
23 researchers looked at all the research they could find
24 on recovery times of marsh and then they presented the
25 ranges of recovery time in here. And what it shows is

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1 the longest recoveries up at the top, like the Gulf War,
2 the Buzzard's Bay spill, that was a long time ago, where
3 the oil was very thick and left in the marsh, the Metula
4 down in the Patagonia, have some very long recovery
5 times.

6 In general, in a riverine environment, you have
7 a lot of sediment flow past the river. You don't have
8 that tidal exchange so you're more than likely to get a
9 narrower band, a stripe. If you have flood, if it's
10 going over a flood plain, that could spread out. But,
11 again, then you would not likely heavy oil, more likely
12 a light staining.

13 **Q. And Mr. Holmes states that he anticipates a**
14 **ten-year recovery for all affected habitats.**

15 **Can you use this as a tool to assess whether or**
16 **not you agree with that statement?**

17 A. I would say that that's probably a
18 conservatively long period. However, given that
19 Mr. Holmes estimates a lot of recovery, that it's, in
20 other words, it's curvilinear, a lot of recovery in the
21 first year, he's assuming 90 percent service loss with a
22 lot of that coming back in the first year and then a
23 tail, the last 10 percent, taking ten years.

24 We might not have the evidence or data to
25 support that, but I probably wouldn't argue vehemently

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1 against it given that it's a lot of recovery. It
2 happens quickly.

3 Q. I want to move on to fish impacts specifically,
4 and I think Council Member Lynch asked Dr. Taylor a
5 question about the Klickitat River and where it
6 intersects with the Columbia.

7 Can you address his question in terms of whether
8 or not species of fish might be more greatly impacted
9 there than maybe somewhere else along the river?

10 A. Well, where you have water and wave action and
11 density, gradients and sediment in the water, oil
12 absorbs very strongly onto sediment. It becomes less
13 bioavailable when it does so, but it absorbs strongly
14 and will go down.

15 And at the mouth of the river if you have a lot
16 of sediment load, you can get oil that absorbs on to it,
17 it's transported down to the sediments and could expose
18 salmon reds where they occur. Exposure, again, is not
19 injury, but there could be -- that can happen.

20 Q. And we're going to get to the distinction
21 between exposure and injury here in a minute, but I just
22 want to make sure we cover these questions.

23 And then the other question I think related to
24 migration of juvenile fish along a shoreline. Can you
25 discuss whether or not there would be impacts from a

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1 worst-case discharge that might more significantly
2 affect migration of the juvenile fish along a shoreline?

3 A. I don't know about whether it would affect
4 migration of fish along the shoreline, but it's possible
5 that some of those fish could be exposed, and
6 particulate oil can cause adverse effects to gills. But
7 again, the water quality pulse would be fairly quick and
8 so it would not be exposed, and it would be exposing the
9 number of fish that are in the river for that relatively
10 short period. Some of those may experience sublethal
11 injuries whereupon they recover and spawn, et cetera.
12 And it's possible -- it's possible you could get some
13 fish kills as well.

14 **Q. Okay. Let's back up more generally to fish**
15 **impacts.**

16 **What sources did you review for this case or**
17 **have you more generally reviewed to determine the**
18 **aquatic species in a river that might be impacted by a**
19 **spill?**

20 A. Generally one of the first things that the
21 environmental types do when they get to the spill is we
22 want a good handle on the resources that are out there
23 that are at risk.

24 So if this were an actual -- if there were an
25 actual incident, the first thing I would want to know is

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1 how many fish are in the river now? What species of
2 fish are in the river amongst the other resources at
3 risk? What birds are migrating through the area now?
4 What mammals are in the -- (Court Reporter
5 interruption.) What birds are present now? What
6 mammals might be present? Where are habitats alike?
7 Are the wetlands -- is it fall? Are the wetlands about
8 to go into senescence? That makes a difference on the
9 impact. (Court Reporter interruption.) Senescence
10 means they just -- are they about to die because it's
11 fall. Sorry.

12 So with the sources we look -- like for fish,
13 for instance, there are many good places with a lot of
14 records of fish in the Columbia River task force, NIMS
15 and NOAA, the fish count data. There's a lot of good
16 sources out there that you can look at what's likely to
17 be present in the river today.

18 **Q. Are those sources discussed in your prefiled**
19 **testimony?**

20 A. I believe -- I'm not sure exactly. Some of them
21 probably are.

22 **Q. Okay. Did you review data or information**
23 **regarding fish runs to define baseline to determine the**
24 **number of fish that might be in the river at the time of**
25 **the incident?**

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1 A. Yes, I did. Essentially I looked at data just
2 to familiarize myself with the numbers that the Abt
3 report was reporting and make sure they were what the
4 literature says.

5 **Q. Okay. And what was your conclusion?**

6 A. That their estimate of the fish that would be in
7 the river was reasonable.

8 **Q. So the Abt report, you don't take issue with**
9 **that part of the report?**

10 A. No.

11 **Q. Can you just describe as generally as possible**
12 **what the most susceptible life stage for an impact on**
13 **fish is?**

14 A. Generally, for all organisms, the juvenile early
15 life stages are more susceptible to toxic effects. In
16 this case, you're developing embryos in the reds and the
17 pre-emergent fry -- (Court Reporter interruption.)
18 Pre-emergent fry, the little guys that are still kind of
19 almost -- they're still down in the eggs.

20 **Q. And are those found in spawning grounds?**

21 A. Yes, they are.

22 **Q. And where does most of the spawning on the**
23 **Columbia River or its tributaries occur?**

24 A. Most of the salmonid species in the Columbia
25 River -- (Court Reporter interruption.) Salmonid. Most

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1 of the salmon species in the Columbia River are spawning
2 up in tributaries or upriver. There is some spawning in
3 the main stem lower river. It's not the majority of the
4 spawning for salmonids in the river but it does exist in
5 the area, near Sauvie Island I understand, down the
6 estuary. But most of the spawning occurs in the natal
7 streams, upriver.

8 **Q. Would that be upriver of the proposed Vancouver**
9 **Energy Terminal?**

10 A. Upriver, or up a natal stream if it's downriver.

11 **Q. And in terms of developing embryos, is that the**
12 **same thing in terms of impact as the fry?**

13 A. It's just a couple weeks later, a fry.

14 **Q. So are those located in the same spawning**
15 **grounds you just referenced?**

16 A. Yes.

17 **Q. Mr. Holmes states at Page 6 of his testimony**
18 **that "outmigrant fish will be exposed for five days and**
19 **adults for a month in the event of a spill."**

20 **Do you agree with that conclusion?**

21 A. I think the outmigrant fish, that's probably
22 fairly reasonable. I think the adults, a month. Given
23 that most of the assessment with the 3-knot current and
24 the pulse of short water quality, that might be a little
25 bit long, conservatively long. It simplifies things in

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1 the assessment because most of the counts are by month.

2 **Q. Can you tell us, how many fish are we talking**
3 **about?**

4 A. In the Abt report, they're talking about
5 exposure, I believe, of -- in the adult fish, somewhere
6 on the order of 35,000 to 130,000 adults, and of the
7 small outmigrants, smaller fish, over a million, I
8 believe.

9 **Q. Okay. And is that the total number of fish that**
10 **would be potentially impacted by the event or is that**
11 **the total number of fish in the river?**

12 A. That's the total number of fish potentially
13 exposed in the river.

14 **Q. And I noticed you're distinguishing between**
15 **terminology "exposure" and "impact."**

16 **Is there a reason for that?**

17 A. Exposure is not necessarily impacting, and the
18 Oil Pollution Act is specific to that regard, that
19 polycyclic aromatic hydrocarbons even in the tissues of
20 animals does not mean injury. There are enzymes that
21 get turned on in our body that are indicators of
22 exposure.

23 When we drink coffee, there are biomarkers that
24 get turned on. It doesn't necessarily mean we're
25 injured. But you drink enough, you can be injured

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1 physiologically.

2 **Q. Okay. So let's turn to impacts then.**

3 **Would a spill result in significant ecological**
4 **impacts on fish populations?**

5 A. There's very little evidence, if any, actually,
6 on the issue of the embryos and the low level effects.
7 First of all, in the scientific community, there's not
8 even agreement that they occur at those low levels.
9 There's some compelling arguments put out there by other
10 researchers. But if we assume they do, and for the sake
11 of this discussion I will assume they do occur, the
12 reported effects is that the return of fish, at least in
13 the Prince William Sound where approximately 99 percent
14 of those embryos don't return under normal
15 circumstances, so you get about a 1.1 to 1.3 percent
16 return rate, and in the oil streams they reported a
17 .8 to .9 percent return rate.

18 Now, if those represent a small area of the
19 overall exposed area, that there's really no way that
20 that could be a population effect, and it hasn't been.
21 There's been no conclusive evidence of any population
22 level effects. Effects to individuals, certainly. But
23 on a population level, no, none in the literature, none
24 reported.

25 **Q. Okay. And earlier you made reference to, I**

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1 think what you refer to as sublethal impacts. Can you
2 just define what you mean by that?

3 A. The sublethal impacts means it might impair you
4 in a number of ways. Maybe your growth is reproduced
5 or, in juvenile fish, swimming efficiency has been found
6 to be reduced. And oftentimes after a spill, if the
7 fishery is closed because there's a concern for human
8 consumption, those fish will -- we've sampled those fish
9 and we will find a signature of the oil in polycyclic
10 aromatic hydrocarbons in the oil, and those fish will do
11 what is called depurate, d-e-p-u-r-a-t-e. They
12 metabolize like we do. You may have changed your oil in
13 your car or got oil on your skin. I guarantee
14 analytically we can find that in your blood after that
15 happened. You're going to metabolize that and that's
16 going to be broken down and you will depurate.

17 And like in a closed fishery, those fish will
18 metabolize, depurate, they will be suitable for
19 consumption again. And there may or may not, there's
20 debate about whether that impairment lasts throughout
21 their life history, but again, there's no conclusive
22 evidence of population level effects.

23 **Q. So is it fair to say that some fish will die if**
24 **there's a spill?**

25 A. Worst-case discharge, yes.

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1 Q. And some fish will be harmed in some way?

2 A. Yes.

3 Q. Okay. But some of those fish who are harmed
4 will survive?

5 A. Yes.

6 Q. Okay. And can you distinguish between the
7 impacts, those impacts on the individual fish or numbers
8 of fish versus the species itself?

9 A. Sure. An effect may be locally meaningful. The
10 example I use is, like I say, a wetland. If you get a
11 wetland and the entire wetland gets oiled and the
12 vegetation dies, that's a major impact to that wetland.
13 But is it a major impact to wetlands or wetland species
14 that reside -- will it have a population effect on
15 wetland species on the Columbia River? Not likely, but
16 it is an effect. So, for instance, if you poured oil on
17 me, that would be a major effect to me but maybe not
18 locally to the people in the room or certainly to the
19 population of people.

20 So completely, I mean I agree if we assume that
21 the assumptions in the Holmes report are correct, I
22 would agree that those adult fish, that some of them
23 could be lost, et cetera, but the adult fish that are in
24 the river at that time during that pulse represent a
25 fairly small percentage of the overall population. In

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1 fact, they represent a fairly small percentage of the
2 number of fish that are removed by fishing every year.

3 Q. Okay. Thank you.

4 And by the way, did you have an opportunity to
5 review the testimony of Dr. Stanley Rice?

6 A. Yes.

7 Q. And Dr. Rice says a lot about low level impacts
8 on fish. And you've touched on this a bit, but I just
9 want to focus on his position.

10 Do you believe that low level early life stages
11 have a significant adverse effect on fish populations
12 and, therefore, on the broader species?

13 A. There's no evidence in the literature of that.

14 Q. Okay. Can you just briefly discuss in terms of
15 other types of impacts of what you have concluded? And
16 let's start with the mammal impacts.

17 A. Mammals are not as susceptible as birds.
18 Birds -- mammals have their protective blubber so they
19 can stay warm when they get oil on them, unlike a
20 bird -- (Court Reporter interruption.) The blubber,
21 their fat.

22 So mammal, the issue with mammals is
23 generally -- is the same issue with humans in the safety
24 risk after a spill, the inhalation, the volatile -- the
25 lung irritation. The same things that we as mammals

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1 would experience if we came into contact with oil.

2 Now, ingestion of contaminated prey is another
3 possible avenue of effect. In general, there's some
4 literature out there that reports that mammals are
5 pretty smart and avoid it when they can. And what we
6 see mostly in oil spills is not big mammal effects
7 because of that. Would there be some? Probably. In a
8 worst-case discharge, there might not be a lot of places
9 to avoid if they're close to an incident. But in
10 general, they're not widespread losses. We didn't see
11 it in the Cosco Busan and the -- (Court Reporter
12 interruption.) I'm sorry. We didn't see the large
13 mammal impacts in the Cosco Busan oil spill in San
14 Francisco Bay where a lot of sea lions down in
15 Fisherman's Wharf there that were potentially exposed.
16 We generally see mammals pretty good at avoiding it.

17 And there's some controversy in the Deep Water
18 Horizon. So that was of course difficult to avoid,
19 given that it was out there for months in very large
20 areas. So the likelihood of a mammal effect in that
21 spill I think would be much greater.

22 **Q. And you've briefly mentioned birds. Can you**
23 **just discuss bird impacts?**

24 A. Sure. Birds are fairly susceptible in that the
25 main avenue of injury typically with birds is that they

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1 get oil on their feathers and then they preen and
2 they'll either ingest the oil or the oil will allow the
3 water to reach their skin and they'll get hypothermia.
4 So either they stop feeding because they're preening on
5 the oil or they'll get hypothermia and succumb to that.

6 So birds, in the Mobil Oil spill there were over
7 400 birds captured for treatment. That's typically a
8 percentage of all the birds that may have been affected.
9 So birds in the area can be adversely affected. But
10 again, on a population level, I'm not aware of any
11 literature that reports a long-term permanent population
12 change to the bird populations from an oil spill, but
13 there would be adverse impacts.

14 **Q. And those impacts could be mitigated by the**
15 **response measures that Dr. Taylor discussed earlier?**

16 A. Hopefully to a large degree. Not only the
17 response measures that Dr. Taylor talks about, but the
18 wildlife contractors are part of the oil spill response
19 plan. In this part of the world, I think it's Focus
20 Wildlife or International Bird Research and Rescue,
21 they're part of the operation, and they will develop
22 hazing plans. They have randomly-fired propane cannons
23 and all kinds of silver whistle tape and all sorts of
24 fancy things to scare birds away from the oil. So we
25 try to keep them away from the oil, but there still will

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1 be impacts. You can't avoid them, you can't avoid
2 completely.

3 **Q. Okay. A few minutes ago you referenced natural**
4 **resource damages and the natural resource damages**
5 **assessment.**

6 **Can you just first of all define what natural**
7 **resource damages are?**

8 A. Yeah. Natural resource damages are defined
9 under -- originally defined under the CERCLA
10 legislation. And under the Oil Pollution Act they're
11 basically a measure of the cost to assess injuries, to
12 scale injuries to restoration, to effect restoration,
13 put it in the ground, and to cover the government's
14 expenses to participate in that. So those costs are
15 borne entirely by the responsible party, the goal of
16 which acquiring, replacing, or restoring the lost
17 services pending recovery.

18 This is unique in the United States. I should
19 mention that in most parts of the world there's
20 something called primary restoration. If you have an
21 oil spill, it's your job to take that environment to a
22 place where it will recover on its own as best as
23 possible. That's primary restoration, bringing the
24 affected environment back.

25 In the United States, the Oil Pollution Act

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1 includes compensatory restoration meaning that any
2 service that was lost pending that period of recovery,
3 you have to replace even though that's going to recover.
4 So, for instance, in the Abt report, I believe the
5 conclusion was over 1,000 acres of wetland restoration
6 would compensate for the assumed service losses in this
7 analysis. That 1,000 acres of wetlands restoration is
8 meant to replace the services that were affected pending
9 recovery.

10 At the end of the recovery period, you have
11 1,000 extra acres of wetland restoration. That's
12 discounted because that won't exist until the future.
13 So its present day value is discounted so that things
14 equal out. So in the final analysis at the end of the
15 day, there will be restoration projects above and beyond
16 the recovered habitat to replace those lost services in
17 the interim.

18 **Q. Can you just describe generally how -- or maybe**
19 **just define what a natural resource damage assessment**
20 **is?**

21 A. The damage assessment is the process where the
22 government basically invites the responsible party to
23 work cooperatively and collaboratively to both scale the
24 injury and then find restoration projects that can
25 equate with the injury.

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1 So that's the process. It's a legal process and
2 the government is required to invite the RP, and the
3 cooperative aspect tends to make things work much
4 better.

5 **Q. In the testimony on this issue, there's some**
6 **references to a habitat equivalency analysis or**
7 **sometimes referred to as an HEA.**

8 **Can you just describe what that is?**

9 A. Sure. Habitat equivalency analysis, basically
10 you're looking at a footprint of an impact on a habitat.
11 Let's say it's ten acres and it's impacted for ten
12 years. Well, then, you've lost ten acre-years. But if
13 that's recovering over time, it would be something less
14 than ten acre-years because next year you would be --
15 I'm sorry. If it's 100 percent service loss this year,
16 you've lost ten acre-years this year.

17 If that recovers to 50 percent next year, next
18 year you only lost five acre-years, and the following
19 year maybe it's fully recovered so that the total loss
20 would be 15 acre-years. So what you owe the government
21 is 15 years of service of a wetland -- of an acre of
22 wetland to replace the lost services.

23 So it's a way to equate injury with restoration.
24 And there's also resource equivalency analysis. Instead
25 of looking at a habitat footprint like a wetland, you

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1 look at number of birds, how many bird years, bird
2 colony years, things like that.

3 **Q. And so are those bird years, for instance, are**
4 **those representative of ecological impact?**

5 A. Well, under OPA, all injuries are compensable.
6 So I guess your question is they're representative of
7 ecological impact to individuals, but perhaps not to
8 population. In other words, under the Oil Pollution
9 Act, unlike the Superfund and CERCLA, if you injure one
10 bird in an oil spill, you have to compensate for one
11 bird even if that doesn't really have ecological meaning
12 on a broader scale to the population. So all injuries
13 are compensable under OPA even if they're not
14 statistically significant effects on the population of
15 organisms.

16 **Q. So that impact to that one animal is damage.**
17 **It's not necessarily representative of ecological --**

18 A. It's an injury to that -- (Court Reporter
19 interruption.)

20 **Q. So you're assessing damages, is that right, when**
21 **you're doing a natural resource damages assessment?**

22 A. Damages being the dollars that it would cost to
23 replace the injured individuals or whatever was injured.

24 **Q. Okay. Thank you.**

25 **And did the Abt report include a natural**

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1 resource damages assessment, projection of one?

2 A. They did include a projection.

3 **Q. Okay. And did they undertake an HEA analysis?**

4 A. Yes.

5 **Q. Okay. Mr. Holmes assumes that there will be a**
6 **90 percent loss of services. Is that ecological**
7 **services?**

8 A. It's a very -- it appears to me to be a
9 simplistic assessment where the authors included birds,
10 fish, kind of everything from bank to bank in the river
11 of a 90 percent loss. That's probably pretty high,
12 because it's unlikely that 90 percent of all those areas
13 would be exposed to a heavy oiling condition that would
14 result in a complete loss. So it's a simplistic
15 assumption for the purposes of maybe planning, but it's
16 doubtful that that would be the reality.

17 **Q. Okay. And moving to the assessment of specific**
18 **damages that Mr. Holmes refers to, do you have an**
19 **opinion about the overall damage value that he places on**
20 **the impact to the environment based on the worst-case**
21 **scenario?**

22 A. I would say it's probably within a range of
23 possible damages that could be pretty broad.

24 **Q. Okay. So, and that number was in the range of**
25 **\$171.3 million; is that right?**

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1 A. Yes, I believe so.

2 Q. So is it fair to say that while you may take
3 issue with the approach taken by Mr. Marsh [sic], that
4 you don't necessarily take issue with the result?

5 A. I don't think it's unreasonable. I looked at
6 other spills and the costs of NRDA settlements in those
7 other spills, and I think it could very well be within
8 the range.

9 Q. Okay. And then Eric English undertook an
10 analysis of impact on fisheries. Do you recall that?

11 A. Yes.

12 Q. Okay. And he concluded that there will be
13 dollar value impacts in three general areas. Do you
14 remember that?

15 A. Yes, I do.

16 Q. Okay. So I want to ask you about his
17 conclusions in that regard.

18 First of all, he concludes that there would be a
19 potential \$4.7 million loss in revenues from commercial
20 landings.

21 Do you have any opinion as to whether or not
22 that is a legitimate conclusion?

23 A. I don't really take issue with it. There would
24 more than likely be a commercial fishery closure; they
25 would not fish. They would have to file claims to be

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1 compensated for their loss.

2 **Q. And you mentioned a commercial fishery closure.**
3 **Is that common in the event of an oil spill?**

4 A. It's common in the event of some oil spills. If
5 you have a large spill in a commercially important area,
6 it would be fairly common to close the fishery and
7 assess the fish, for the health department to assess the
8 tissue burdens.

9 **Q. So that's a human health issue?**

10 A. Yes.

11 **Q. And does such a closure have any impact on the**
12 **recovery, if you will, of the impacted population?**

13 A. It certainly can. Obviously, a closure is not
14 good for fishermen, and -- recreational or commercial,
15 but I believe in the English report he talked about
16 2.4 million kilograms, perhaps, I think it was, of fish
17 commercially taken. I don't know how much fish for
18 recreational, but 350,000 trips a year, approximately
19 four people per trip, everybody catching a fish. In
20 other words, there's hundreds of thousands of fish that
21 would not be killed by fishermen that would swim upriver
22 and spawn.

23 I've looked at a lot of spills. After the Cosco
24 Busan in San Francisco, there was a prediction that
25 would be a big problem for herring because of the low

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1 level effects. They closed the fishery permanently
2 because the fishery was very much in jeopardy in the San
3 Francisco Bay prior to the spill, and the following
4 years were very good years for herring.

5 I looked at the Gulf of Mexico catch statistics
6 just last night -- (Court Reporter interruption.) -- on
7 the National Marine Fishery Service site data from
8 Louisiana, Mississippi, from 2007 to 2014. 2011 was the
9 highest catch year. An oil spill is not a good thing.
10 A fishery closure is a good thing. That's how a lot of
11 times fisheries are managed. If you don't kill a half
12 million fish and they don't swim upstream and spawn,
13 that's just more fish than were estimated affected as
14 adults in the Abt report.

15 The responsible party is not going to get credit
16 for that, by the way. That's not a plus to the natural
17 resource damage assessment. That's an aside. The
18 responsible party has to compensate for those fish that
19 if Abt report is correct, for those fish that were
20 assumed lost. You don't get a bonus.

21 Another good example, in the Athos I spill in
22 the Delaware River, it occurred during hunting season.
23 It's a big duck hunting part of the world there. There
24 were an estimate of 3,000 birds affected by the oil and
25 13,000 birds not shot by hunters because of the closed

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1 season. We don't get any credit for that, but that's
2 good for the birds. It's hard to deny that that's good
3 for the birds to not be shot.

4 Q. Okay. And back to Eric English's conclusions.
5 The second area he opined about was a decline in
6 expenditures by recreational anglers, and he valued that
7 at \$14.4 million, approximately.

8 Do you have any opinion about his conclusion?

9 A. I have no reason to doubt those numbers.
10 Fishing is extremely important to a great many people on
11 the Columbia River.

12 Q. Okay. And finally, he concluded that there
13 would be damages of approximately \$17.8 million relating
14 to the decline in the value of the recreational fishing.

15 Do you have any opinion about that conclusion?

16 A. That's possible.

17 Q. And are those factors that you would normally
18 take into account when assessing the overall impact of
19 an event like the worst-case spill scenario?

20 A. Yes. Yes.

21 Q. There have been some other witnesses who have
22 provided testimony. One is Roger Dick. Did you have an
23 opportunity to review his testimony?

24 A. I did.

25 Q. And Mr. Dick has stated that tribal fishers have

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1 reported that the Yakama Nation fisheries that after a
2 spill, presumably a crude oil spill, the catch of fish
3 declined significantly.

4 Is there anything in the work that you've done
5 that would suggest such a decline, I guess, other than
6 the closure of the fishery you just discussed?

7 A. Yeah. I'm not aware of what might cause that.

8 **Q. Okay. And did you review the testimony of**
9 **Stuart Ellis?**

10 A. Yes.

11 **Q. And Mr. Ellis testifies about a stigma that**
12 **would impact fisheries.**

13 **Do you have any opinion about whether or not**
14 **that's a legitimate concern?**

15 A. I think that's a legitimate concern. Consumers
16 that buy fish from the Columbia River might be worried.
17 Recreational fishers that catch fish and eat them, I
18 think stigma -- (Court Reporter interruption.) That
19 might normally capture and consume fish might be
20 concerned.

21 **Q. And how long would you expect any such stigma to**
22 **persist?**

23 A. Generally on oil spill cases, the natural
24 resource economists and those for NOAA that work on
25 those things generally assume about a year. In a really

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1 bad situation, maybe it would be two.

2 Q. Okay. And you discussed or you mentioned
3 earlier the compensation for lost revenue in the fishing
4 industry. Can you just expand on that a bit?

5 A. Sure. The fishermen would submit a claim based
6 on how much they normally earn, and they're afforded
7 that claim if they can produce a record of their
8 earnings from previous years. They wouldn't have to be
9 paid by the responsible party. It's a claims process
10 that the Coast Guard establishes and sets up to help
11 people through that process.

12 Q. Okay.

13 MR. JOHNSON: Nothing further, Your Honor.

14 JUDGE NOBLE: Cross-examination?

CROSS-EXAMINATION

16 BY MR. KERNUTT:

17 Q. Mr. Challenger, good afternoon. I know it's
18 late in the day for everybody and the room is a little
19 hot, so I will attempt to not to take too much time.

20 My name is Matt Kernutt. I'm the statutory
21 counsel for the environment in the proceedings for
22 EFSEC. And I have a few questions for you based mostly
23 on your prefiled direct testimony, but a little bit in
24 relation to your live testimony today.

25 One thing that struck me in your prefiled direct

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1 testimony, and this is located on Page 6 of your
2 prefiled direct testimony, it's Paragraph 12, you talk
3 about a large seismic event. In your testimony, you
4 testify that you expect very little oil to be found in
5 the aftermath of a large seismic event.

6 Do you see that portion of your testimony?

7 A. Yes, I do.

8 **Q. Why is it that you expect there to be little oil**
9 **found in the aftermath of a massive seismic event?**

10 A. I say little oil may be found.

11 **Q. Fair enough.**

12 A. But why I would expect that is I'm not an
13 earthquake expert. I have worked after big disasters.
14 I worked on the Murphy oil spill in Hurricane Katrina
15 where it was very difficult to find the missing
16 3.8 million gallons.

17 I did some research. I looked at the Hokkaido
18 earthquake in Japan and the Chile earthquakes and
19 liquefaction, and there were 90 tanks that lost oil in
20 the Japanese earthquake and I could find no record of
21 spill response. You get a liquefaction, you get this
22 sort of a mud flow. If you think about, say, the Mount
23 St. Helen's eruption and sort of the pyroclastic flow
24 and the ash, if there were oil in that ash, it probably
25 wouldn't have made much of a difference on burying all

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1 the salmon redds in the entire river. If you have
2 liquefaction of the shorelines and you get a big mud
3 flow, you're probably going to get effects to the --
4 again, I'm not an earthquake expert, but what I've seen
5 in Chile and Japan, there could be bigger problems.

6 Q. So in a large seismic event, for example, the
7 worst-case discharge here I believe is over
8 350,000 barrels of oil released into the Columbia in
9 relation to a massive earthquake. Let's assume for the
10 purposes of this discussion that that oil does reach the
11 river.

12 Would it be -- what kind of response time -- do
13 you have any experience in relation to would response
14 times be delayed for oil recovery, would you assume, in
15 a massive seismic event?

16 A. I would say so.

17 Q. On Tab 18, this is Paragraph 47 of your prefilled
18 testimony, you state that "large spills" -- I assume oil
19 spills in rivers -- "do not always result in major and
20 wetland impacts."

21 Is that an accurate characterization?

22 A. Yes.

23 Q. And you cite to a couple of spills as support
24 for that. I'd like to sort of explore those spills that
25 you cite.

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1 A. Sure.

2 Q. The first one that you cite to is the
3 M/V WESTCHESTER spill; is that correct?

4 A. Yes.

5 Q. Do you know what volume of oil was spilled in
6 that event?

7 A. I believe it was about a half a million gallons.

8 Q. And in barrels that would be? I'm not great at
9 math.

10 A. It would be about --

11 Q. Around 14,000?

12 A. Somewhere in there, yeah.

13 Q. So this is a substantially smaller spill than,
14 say, the worst-case discharge from the facility or a
15 vessel spill for this case; correct?

16 A. Yes.

17 Q. What type of oil was spilled in the WESTCHESTER
18 spill, do you recall?

19 A. I believe it was a bunker. It was black oil,
20 though, it was intermediate.

21 Q. Like a Nigerian crude? Would that be --

22 A. Are you reading -- I'll take your word for it.
23 I'm not sure exactly.

24 Q. Okay. Do you know what the recovery rate was
25 for the oil spilled in that spill?

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1 A. I don't know what -- sure what the recovery was
2 assessed at, but I know that the damages were fairly low
3 for a spill, because there was -- again, damages, the
4 cost of replacing resources can sometimes be inexpensive
5 so it's not necessarily a reflection on the ecological
6 loss.

7 In other words, we created -- in that instance
8 we created marsh on the lower Mississippi River just by
9 breaching the levy in one location, so the cost was very
10 low and the benefit was very high. So the damages would
11 be low even if the ecological injury may have been
12 higher, and vice versa. Sometimes projects are very
13 expensive even if the ecological injury might be low,
14 but it's very expensive to build a -- to restore loons,
15 for instance, because you have to buy a lake in Maine
16 and tear down a million-dollar home so that they can
17 have a nesting ground. So the damages necessarily don't
18 equate with the ecological injury.

19 **Q. So in the M/V WESTCHESTER spill, would you**
20 **characterize the ecological injury as high as opposed to**
21 **the damages?**

22 A. I would not. I would characterize the
23 ecological injury as relatively low in a spill of that
24 size.

25 **Q. In a spill of that size. Okay.**

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1 Let's move to the second spill you cite in that
2 paragraph, and I'm probably going to butcher this name,
3 but that is the EAGLE OTOME spill in the Sabine River?
4 Am I saying that anywhere near correctly?

5 A. No.

6 **Q. Why don't you correct me on my pronunciation.**

7 A. EAGLE OTOME, and Sabine.

8 **Q. Thank you.**

9 **What year did that spill occur, do you recall?**

10 A. It was 2010.

11 **Q. Do you know what caused that spill to occur?**

12 A. It was a collision ship and a barge in a very
13 narrow waterway right in front of Port Arthur.

14 **Q. What volume of oil was spilled in that event?**

15 A. I believe, again, that was in the order of
16 14,000 barrels, half a million gallons.

17 **Q. Are you aware of what the recovery rate was for
18 that oil?**

19 A. The cleanup was over in 22 days, and we haven't
20 finished the natural resource damage assessment on that,
21 but the -- I believe the agencies and ourselves are in
22 agreement that the impacts were not substantial for the
23 size of the spill.

24 **Q. Was the recovery rate greater than 50 percent?**

25 A. You mean oil recovery --

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1 Q. Oil recovery, not --

2 A. -- I don't know what the -- (Court Reporter
3 interruption.) Don't know what the oil recovery rate
4 is.

5 Q. He doesn't know what the oil recovery rate is.
6 In your experience what would be for a spill
7 like this the oil recovery rate?

8 A. A good recovery rate I'd say is anything over
9 50 percent is very good, more than likely.

10 Q. Okay. So that would leave some oil still
11 existing in the environment?

12 A. Sure.

13 Q. Okay. Tab 18, Paragraph 48 of your prefiled
14 testimony, you reference the Enbridge pipeline spill?

15 A. Yes.

16 Q. Do you recall what kind of oil was spilled in
17 that spill?

18 A. I believe that was a dilbit.

19 Q. At Paragraph 48 you refer to that spill as
20 requiring 5 to 15 years of recovery time for in-stream
21 habitats; is that accurate?

22 A. That's what the agencies used to develop a
23 restoration plan.

24 Q. That 5 from 15 years of recovery time, what is
25 that date calculated from, the date of the spill?

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1 A. The date of the spill.

2 Q. And how much oil was spilled in that spill, do
3 you recall?

4 A. I don't have the exact number.

5 Q. In your testimony you also refer to the Kinder
6 Morgan Inlet spill. Do you recall that portion of your
7 testimony?

8 A. Yes.

9 Q. And unfortunately, I did not write for the
10 benefit of the council the paragraph that is located in,
11 in your testimony.

12 Do you recall what kind of oil was spilled in
13 that spill?

14 A. Yes. That was a dilbit.

15 Q. Do you recall how much oil was spilled?

16 A. I believe it was on the order of 130,000 liters.
17 I'm not sure exactly.

18 Q. You note in your testimony -- I'm sorry, this is
19 Paragraph 66 on Page 27 for the benefit of the council.
20 That's wrong. I'm sorry. I'm getting incorrect
21 information on that, counsel. I apologize. It's 51.
22 Thank you.

23 Do you know, from -- do you recall how many
24 meters of shoreline that spill affected? We were
25 talking about the Kinder Morgan spill.

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1 A. It was roughly 10 miles. 15,000.

2 Q. 15,000? Thank you.

3 Are the conditions in this inlet similar to the
4 Columbia River in any way?

5 A. In that they're in a similar climate.

6 Q. So this would be, you referred previously to
7 tidal. This would be more tidal impacts?

8 A. Yes.

9 Q. Okay. You referenced a little bit earlier
10 that -- let me back up. Strike that.

11 For the purposes of a natural resource damage
12 assessment, how long do those typically take to
13 complete?

14 A. Very variable. Sometimes early restoration is
15 affected during the spill response, and sometimes they
16 go on for ten years.

17 Q. And so in your experience, for example, let's
18 say a claim, a fisherman claim for damages associated
19 with a spill, would that need to be -- would that wait
20 until the assessment is complete before payment would
21 occur?

22 A. No. Typically, if a fisherman is not fishing
23 because of a closure, he's getting paid for what he
24 would normally earn. Now, if there's a claim in the
25 long-term that the fishermen in the future aren't going

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1 to catch as many fish, that could take a while to sort
2 out.

3 **Q. So the Deep Water Horizon spill, what year did**
4 **that occur in again?**

5 A. 2010.

6 **Q. Have we completed the damage assessment for that**
7 **spill yet?**

8 A. The consent decree has been issued.

9 **Q. Issued? Okay. And how long did that take?**

10 A. That was last summer, last June, so five years.
11 There were also a lot of early restoration actions taken
12 during the spill.

13 It's very -- I'm not going to say popular, but
14 during a spill response, it's an emergency and a lot of
15 the permitting is waived. And you have the gentleman
16 with the captain of the Port that can say go do things.
17 And a lot like starting in the NEW CARISSA, during the
18 spill we had heavy equipment on the beach, so while we
19 had it we enhanced plover habitat.

20 In the Gulf of Mexico they built barrier
21 islands. They did lots of early restoration things just
22 knowing they were going to need that in the bank down
23 the road. So starting early is always recommended
24 nowadays.

25 MR. KERNUTT: I have no further questions at

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1 this time.

2 JUDGE NOBLE: Any other cross-examination?
3 Redirect?

4 REDIRECT EXAMINATION

5 BY MR. JOHNSON:

6 Q. Mr. Challenger, can you just clarify the size of
7 the Deep Water Horizon event as it compares to the
8 worst-case scenario that you were assessing here?

9 A. I couldn't give you the factor, but a lot
10 bigger.

11 Q. By an order of magnitude?

12 A. I would say so, yes.

13 MR. JOHNSON: Thank you.

14 JUDGE NOBLE: Council questions?

15 How about Mr. Stohr?

16 MR. STOHR: Good afternoon, Mr. Challenger.

17 I'm curious how you have or if you have
18 considered spill impacts in terms of the Endangered
19 Species Act and the potential for take. And the reason
20 I bring that up, you made a statement around fisheries
21 closures being a good thing, and I don't know if you're
22 aware that a lot of our fisheries are based on hatchery
23 fish, and hatchery fish are regulated in terms of their
24 returns by hatchery genetic management plans.

25 That's a federally-required process that

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1 focuses on making sure those hatchery fish don't return
2 to native spawning beds because of the genetic
3 intermixing that occurs there. And so there's a
4 potential for some real impacts on the long term to
5 fisheries if you violate those HGMPs.

6 Did you look at that when you looked at the
7 impacts?

8 THE WITNESS: I did not look at that
9 specifically. And I don't want to make the opinion that
10 it's all a good thing. It's a good thing to the fish
11 that wasn't killed, I would say. And in some instances,
12 you will get a lot of survival that you normally
13 wouldn't have had.

14 But no, I didn't look at the hatchery fish
15 and the fact that not removing them from the population
16 could present some challenges.

17 MR. STOHR: How about tribal treaty rights
18 and ceremonial subsistence take in terms of a loss of
19 access to a fishery?

20 THE WITNESS: They would all be impacted,
21 absolutely, during fishery closures, and the stigma and
22 the same things that affect the recreational and
23 commercial. Absolutely.

24 MR. STOHR: I guess the last question, at
25 one point you mentioned 30,000 -- I might not have these

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1 numbers right, but 30,000, 100,000 and a million in
2 terms of the -- I think the question had to do with the
3 number of fish that were present.

4 THE WITNESS: In the Abt report, I
5 believe -- and I don't have those numbers exact, but in
6 the Abt report, he talked about the fish estimated
7 present that could be exposed at the time if there was a
8 five-day period or a month period for adults. And it
9 was by reach, Reach 1, Reach 2, and I believe those
10 totals were several -- a million or two smolts and then
11 30- or 40- to 130,000 adults or something like that.

12 MR. STOHR: That's the point I wanted to
13 make. I think those are salmonids, right?

14 THE WITNESS: Right.

15 MR. STOHR: We've got sturgeon --

16 THE WITNESS: Right.

17 MR. STOHR: We've got chad --

18 THE WITNESS: Right.

19 MR. STOHR: -- we've got lamprey. (Court
20 Reporter interruption.) All types of other fish there.
21 So I just wanted the council to be aware that those
22 numbers referred specifically to salmon.

23 THE WITNESS: They did, correct.

24 MR. STOHR: Thank you.

25 JUDGE NOBLE: Mr. Stone?

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1 MR. STONE: Good afternoon.

2 With respect to your testimony regarding
3 sublethal effects on fish, is it possible that sublethal
4 effects can affect the behavior of a fish such that they
5 become prey to predator fish?

6 THE WITNESS: Yes, it is.

7 MR. STONE: So in fact, sublethal effects,
8 although it doesn't create directly mortality, in the
9 end it creates mortality by becoming prey?

10 THE WITNESS: It's possible.

11 MR. STONE: Thank you.

12 JUDGE NOBLE: Mr. Snodgrass?

13 MR. SNODGRASS: Just one question.

14 You had mentioned in your research that not
15 finding oil in, I believe, the Japan example that you
16 cited, is that the Fukushima earthquake or --

17 THE WITNESS: Hokkaido. I think there was a
18 tank farm in 2003.

19 MR. SNODGRASS: I think you mentioned
20 90 tanks failed?

21 THE WITNESS: There was a report of 90 tanks
22 of oil that leaked, and I don't know if that was all of
23 it or I don't know what it was. And I can't say that
24 there was no oil, I just could find no reports of a
25 spill response or a spill -- I could find lots of

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1 reports of other stuff.

2 MR. SNODGRASS: Well, do you have that
3 report? Is that in the record?

4 THE WITNESS: Just last night I was looking
5 online for liquefaction effects. I found some in Chile
6 and Japan.

7 MR. SNODGRASS: Could you enter into the
8 record what that source of information was in Chile and
9 Japan?

10 THE WITNESS: If I can find it again,
11 absolutely. I'll find it.

12 JUDGE NOBLE: Anyone else to my right?
13 Mr. Lynch?

14 MR. LYNCH: Thank you, Mr. Challenger.

15 This is with respect to you testified
16 earlier about the pulse effect on fish that can happen,
17 just some fish that just happen to be there at the time
18 might be impacted.

19 Are you familiar that hatcheries tend to
20 spawn fish over a range of time? They don't just spawn
21 the first fish that come back, but they spawn early
22 returners, regular returners, and late returners?

23 THE WITNESS: Yes.

24 MR. LYNCH: Can you state the reason why
25 they do that?

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1 THE WITNESS: I'm not exactly sure.

2 MR. LYNCH: Let me just say -- I'll just say
3 what my thought is and you can disagree with me.

4 Part of the reason they do that is to make
5 sure that you have fish that are coming back under
6 different conditions that might exist for habitat. So
7 in other words, if there was something blocking a stream
8 at one point in time, you have all the fish coming back.
9 If they all came back at the same time, you'd have a
10 devastating impact. But if you have different fish from
11 that run coming back at other times, you're still
12 allowing them to come back and spawn.

13 Does that make sense to you?

14 THE WITNESS: Makes sense. Withstanding
15 environmental variability population.

16 MR. LYNCH: And I guess that's what I'm
17 getting at, is that if you have a pulse that you just
18 hit a bunch of late returning fish or early returning
19 fish, do you think in the long term you might affect the
20 viability of that particular run?

21 THE WITNESS: I haven't seen evidence of
22 that. I mean, the pulse is not likely to result in
23 mortality to all of them to begin with. And so there
24 will be spawners. It's just, again, there's certainly
25 evidence of adverse -- a variety of adverse effects from

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1 oil and fish. What we just don't see is conclusive
2 evidence of a population effect in any of these
3 incidents on the future catch or future numbers. It's
4 not discernible.

5 MR. LYNCH: Okay. Thank you.

6 JUDGE NOBLE: Mr. Moss?

7 MR. MOSS: Mr. Challenger, in Paragraph 61
8 of your prefiled testimony, the last two sentences there
9 you say, "Impacts from rail spills are not likely to be
10 'closed.'" And then the next sentence you say,
11 "conclusions of major surface water and aquatic resource
12 impacts from rail relative to vessel scenarios are not
13 warranted."

14 Would this be true along all stretches of
15 the rail line through the Columbia River valley, or
16 would you make a different statement perhaps with
17 respect to those parts of that rail line where the
18 railroad is on a narrow spit of land immediately
19 adjacent to the river assuming a derailment there?

20 THE WITNESS: I would say that there would
21 be -- a rail spill of the same size could have variable
22 impacts depending on where it occurs, but my main point
23 there is that there seems to be some confusion. There
24 doesn't seem to be a lot of consistency in defining
25 minor, moderate, major.

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1 In some instances, it's used as, if this
2 wetland is oil, that will be a major impact to the
3 wetland. It was kind of confusing to me in reading that
4 that to me there's -- if a small spill results in a
5 major impact, then we need a new adjective for the
6 worst-case discharge.

7 So that's basically my point is that
8 relative to a worst-case discharge from a vessel no
9 matter where it spills, it's not likely to have the same
10 level of impacts. So calling them both major doesn't
11 really give me an idea of the relative difference
12 between them.

13 MR. MOSS: So maybe we can have a
14 major-major.

15 THE WITNESS: Major -- super major.

16 MR. MOSS: Something like that. Sounds like
17 Catch-22.

18 The reason I asked is because I was
19 wondering when you talk about significant portions of
20 the rail corridor, I wasn't sure whether you were
21 referring to the fact that it's a very long corridor or
22 referring to its characteristics such as I described.
23 It occurred to me that that's -- that could be
24 significant or perhaps we could even say major impacts
25 in the event the derailment happened in the wrong spot.

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1 Would you agree with that?

2 THE WITNESS: Relative to other rail spills.

3 MR. MOSS: Yes. Thank you.

4 JUDGE NOBLE: Anything else, Mr. Moss?

5 MR. MOSS: No.

6 JUDGE NOBLE: Mr. Stephenson?

7 MR. STEPHENSON: Thank you, Mr. Taylor. Two
8 issues. I think they are both -- I'm sorry,
9 Mr. Challenger. I'm talking about one of them is
10 related to Taylor.

11 But the first one you said, and I wrote the
12 note and I don't have the whole thing, but there were no
13 bank to bank and then I have dot-dot-dot because I
14 didn't finish that.

15 What does "bank to bank" mean?

16 THE WITNESS: In the Holmes report, in the
17 Abt report, there's an assumption of a 90 percent
18 service loss in the corridor, which is the river bottom,
19 both banks, that a 90 percent service loss pretty much
20 means all ecological services are gone. That would not
21 likely occur bank to bank, all habitats for that entire
22 reach. The oil trajectory just wouldn't hit a lot of
23 those places. Some of the places it would very heavily
24 and other places it would hit lightly and some places it
25 would -- like in the Mobil Oil spill, it missed a lot

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1 and sent tar balls out to the estuary.

2 So it's a simple assumption for, if it were
3 correct the damages might be this, which is fine for
4 planning purposes, but I don't think it's realistic.

5 MR. STEPHENSON: As the river winds down in
6 a curved channel, a spill or just the current would go
7 potentially from one bank across to the other bank,
8 right? That's not what you're talking about?

9 THE WITNESS: No. I mean you would have --
10 you could -- in a worst-case discharge, you'd have oil
11 on both banks and in locations. It just wouldn't be
12 smothering both banks from bank to bank the entire
13 100 percent downriver. That's a very unlikely scenario.

14 MR. STEPHENSON: Thank you.

15 And then the second issue, it's on Page 11,
16 Paragraph 29, you talk about -- and I'm just trying to
17 clarify your testimony versus Dr. Taylor's. And sorry
18 for calling you Dr. Taylor earlier.

19 You say that "an estimated 15 to 18 percent
20 of the spilled oil" -- this is dilbit -- "that entered
21 the Kalamazoo River ended up estimated to become
22 submerged."

23 And it sounds like, and I can't understand
24 what that means. It sounds like it refloats. And I'm
25 trying to figure out, did it submerge, did it refloat?

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1 How long did that take? Would it have been boomed?

2 THE WITNESS: This was a spill I didn't work
3 on, so I'm reading this from another report. But I
4 believe that the government estimated that 15 to
5 18 percent sunk. And through agitation, it's one of the
6 API recommended cleanup methods is can you get it -- can
7 you agitate it, bring it back up and collect it. And so
8 they believe that a significant portion was re-released
9 through agitation. It's going to stay down there if you
10 don't do it where it caused -- or some of it at least
11 was contained and collected.

12 MR. STEPHENSON: Thank you.

13 JUDGE NOBLE: Mr. Rossman?

14 MR. ROSSMAN: Thanks for your testimony. I
15 have a couple different types of questions I want to
16 ask.

17 The first is about sort of the literature
18 review. You've responded a number of times to questions
19 that you didn't see any evidence of something in the
20 literature. And I guess I'm hoping to understand a
21 little better what implications we should take from
22 that.

23 Is absence of evidence evidence of absence
24 in this case? Is there enough of a body of literature
25 for us to conclude that there are not population impacts

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1 of this diffuse oil exposure?

2 THE WITNESS: In my opinion, I think there
3 are many years of data post-spill, certainly from the
4 Valdez, of fish populations. Like for the herring, I
5 think that issue is by and large in the scientific
6 community, that that was not a result of a spill.
7 There's still some disagreement, but there's certainly
8 no clear evidence the pink salmon populations did not
9 crash. I mentioned in the Cosco Busan, the herring
10 populations went up.

11 I think there's a lot of studies out there,
12 actually, that would provide evidence that if there's a
13 population effect, it's not easily discernible, because
14 populations are variable naturally and it's very
15 difficult to detect. And, you know, for that reason,
16 say, Washington State Department of Ecology has their
17 Natural Resource Damage Assessment Compensation
18 Schedule. The Resource Damage Assessment Committee gets
19 together when there are -- in any spill they get
20 together and they have to answer a certain number of
21 questions, and one of them is are we likely to find a
22 definitive result if we do studies? And when that is
23 answered no, which it is, frankly, most of the time,
24 they go to the compensation schedule. So there's a
25 recognition that it is not easy to always go out and get

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1 a definitive result in the environment and see an
2 impact.

3 And does that mean there's not one? No.
4 But that might raise a question of how major it is if
5 you can't discern it from the data.

6 MR. ROSSMAN: That answer makes sense to me.
7 I'm not a biologist, but I have some statistical
8 background. And I guess I wonder, in your opinion are
9 there conclusions that we can draw from Exxon Valdez and
10 the San Francisco Bay applicable to the Columbia River?
11 It just seems like a very different environment.

12 THE WITNESS: It does. I think the
13 conclusions say, for instance, the Exxon Valdez would be
14 conservative for us, for this case, because you have, in
15 the Exxon Valdez you have these king tides, 20-foot, and
16 you have a shoreline that's very porous. So you have
17 this oil leading back and forth, going very deep into
18 the shoreline where it will persist for many years, as
19 it has in some locations.

20 I don't think you have the same situation in
21 the Columbia River. You would more likely get a band of
22 oiling. I don't -- I've not heard of any of the Mobil
23 Oil persisting for long periods of time. We don't see
24 it in the Mississippi River and things like that.

25 I think the persistence in a situation like

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1 where you have that porosity and that oil that can leach
2 down into there, you get longer persistence. It's a
3 colder environment too. The oil tends to weather faster
4 in warmer environments by biodegradation and
5 photo-oxidation, et cetera.

6 MR. ROSSMAN: I appreciated the point you
7 made about where there's a fishery closure there's a
8 large number of fish not taken, and was sort of tempted
9 to draw the conclusion from that that you were
10 testifying that there would be a net benefit potentially
11 to a large spill, but then I heard you say things that
12 seemed to pull back from that conclusion. And I guess
13 I'm hoping you can clarify.

14 THE WITNESS: I'm not going to stand in
15 front of anybody and say an oil spill is a good thing.

16 MR. ROSSMAN: Why not, I guess is my
17 question.

18 THE WITNESS: Because it's not. But for the
19 spill, like on that example in the Athos I, 13,000
20 waterfowl were not shot. That is a plus.

21 I'm not going to give the responsible party
22 or a spiller a gold star or anything for that and
23 neither would the government. That doesn't count as
24 part of your merit of compensation, but it is a reality.

25 MR. ROSSMAN: Well, sure. From an economic

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1 perspective, there was loss to people who didn't get to
2 take those birds, absolutely. But I guess from an
3 ecological perspective.

4 THE WITNESS: Not likely population effect
5 from the oil on the birds. If you have a bird
6 population like, say, in the NEW CARISSA oil spill, you
7 have plovers that are threatened or endangered in Oregon
8 because they're on the northern end of their range.
9 Now, that's a case where you have a risk to a local
10 population. They exist all the way down to California
11 and Mexico where there are a lot of them. But the
12 local, state, little population could be at risk and is
13 a concern during the oil spill for them to be protected.

14 But on a larger scale, the population
15 effects to birds are -- would be difficult to detect.
16 There are large populations, and even though the numbers
17 in a spill that are affected seem like a big number,
18 they're not a big number in terms of the populations of
19 many species out there.

20 MR. ROSSMAN: Thank you.

21 Shifting gears a little bit in regard to
22 sort of the conclusion of the Abt study, total dollar
23 impact of somewhere around 175 million, you testified
24 you thought that was reasonably within a range of what
25 impacts might be. I have two questions about that.

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1 One is, given the number of places that
2 you've assumed that the impact would be less than
3 described in that report, for example, not 90 percent
4 impacts, what are the -- that would make me assume that
5 there are places where you would think that the impact
6 or the estimates would be higher such that you could get
7 to an equation that gives you a similar number.

8 Is that the case?

9 THE WITNESS: I think it's possible, yeah.
10 I think that the Abt report looked at wetland
11 restoration. There's other costs in there; the cost of
12 the assessment, the cost to the government. There might
13 be separate settlement with -- for cultural resources,
14 if that isn't captured. Or oftentimes bird injuries,
15 fish injuries, habitat injuries that create wetland are
16 all looked at separately.

17 So, you know, and in this day and age, and
18 there's a lot of awareness in the public and these costs
19 tend to be rising. So even though I might not agree
20 completely with the assumptions of ecological injury,
21 the costs can be fairly high.

22 MR. ROSSMAN: What would you think that that
23 range of costs could be, that the 175 falls within?

24 THE WITNESS: I don't know. It's nearly
25 impossible to predict. I think in the Holmes report he

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1 looked at other spills and costs per gallon. That's
2 probably a good way to go. I don't know what the
3 conclusion was, but that's probably a fairly reasonable
4 way to go about it. Not every spill is different, but
5 that could help bracket a range.

6 MR. ROSSMAN: I'm not familiar with the
7 details of some of the regulatory requirements that
8 require the restoration that you've talked about, but I
9 guess I'm wondering, it seems to be that all of us
10 assume that the responsible parties has the capacity to
11 pay those costs.

12 We've heard testimony earlier today that
13 there would be a minimum of \$25 million of environmental
14 insurance and some amount more than that, but not a
15 defined amount. So we don't know what amount of
16 financial assurance the responsible party would
17 potentially have for a spill.

18 Are there other sources of funding that
19 would pay for that recovery work or would it not happen
20 if the responsible parties' financial reserves were
21 depleted?

22 THE WITNESS: There's the Oil Spill
23 Liability Trust Fund that the Coast Guard administers
24 that is paid for by a tax on fuel coming and going, so
25 much per barrel. When there's an orphan spill, say

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1 where the government finds somebody spilled oil and we
2 don't know who did it, the liability trust fund is
3 opened up when that happens. But I'm not aware of any
4 sort of financial issues with the funding.

5 MR. ROSSMAN: So you think that trust fund
6 would be available in this case or in a spill in the
7 Columbia?

8 THE WITNESS: Oh, yeah. That's exactly what
9 it's for, any oil spill that there's no responsible
10 party or no funds to cover for it.

11 Same thing for claims. If there's an orphan
12 oil spill and fishermen are affected, they can split a
13 claim to the Oil Spill Liability Trust Fund. And that's
14 not taxpayer money, that's oil industry.

15 MR. ROSSMAN: Do you happen to know at what
16 level that's capitalized?

17 THE WITNESS: After the Deep Water Horizon,
18 at a very high level. I don't know what it is, but
19 there's a -- I don't know. Probably starts with a B.

20 MR. ROSSMAN: Thank you.

21 JUDGE NOBLE: Are there any other council
22 questions?

23 Mr. Siemann.

24 MR. SIEMANN: Good afternoon. Thanks for
25 being here. A couple of questions.

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1 First, are you familiar with the National
2 Heritage Program?

3 THE WITNESS: I am.

4 MR. SIEMANN: And do you know if -- so the
5 National Heritage Program, of course, manages rare and
6 unique species in the State of Washington and each state
7 has its own.

8 Are you aware whether your assessment or the
9 Abt assessment considered whether species in the
10 National Heritage Program would be -- that are attracted
11 to the National Heritage Program that are unique and
12 rare would be affected by an oil spill?

13 THE WITNESS: You know, we did a search of
14 the National Heritage Program for just to see if
15 anything turned up, and there are a number of species
16 that are rare or that are along the corridor, but
17 they're affected like all other species. They generally
18 don't suffer from different effects of toxicology, et
19 cetera. And, but it is a concern when you have a
20 localized unit or species that's very rare and to
21 protect like the snowy plover example. But I'm not
22 aware in an oil spill of the loss or of species like
23 that.

24 It's a risk, if you have a rare species and
25 along the water. But I don't believe we found any sort

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1 of, you know, right-along-the-water's-edge-type species
2 that were that rare. But I'd have to look again. But
3 the risk is there.

4 MR. SIEMANN: But you're not aware of any
5 species that perhaps could -- any specific species for
6 which there could be a population effect as opposed to
7 just a specific individualized --

8 THE WITNESS: I'm not aware. I'm not aware,
9 and as always, never say never, but I'm also not aware
10 in the literature of any reports of those things
11 happening.

12 There was a spill, the ANITRA in New Jersey.
13 It was a plover issue again on this case, the East Coast
14 plovers, they seem to be rare everywhere. And there was
15 concern because the population was so small that they
16 would be extirpated, but that was not the case. In
17 fact, the actions of the spill to address the sort of
18 restoration and protection of their habitat, there's
19 plovers in New Jersey more today than there were when
20 the spill happened.

21 MR. SIEMANN: One other question reflects in
22 regards to tribes.

23 How do you calculate natural resource damage
24 from the point of view of tribes?

25 THE WITNESS: Well, I'm certainly not an

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1 expert, but cultural and spiritually important things,
2 to my view, they're culturally and spiritually
3 important, and those services flow from the ecology to
4 some extent. And if the ecology is made whole, and in
5 working with First Nations in Canada and tribes down
6 here, that that is at least part of it. If you can make
7 the environment whole, that's where those cultural
8 resources flow from, then that addresses at least some
9 of that. The stigma, the loss, the long term, there's
10 certain things that are sort of personal.

11 But from at least from a habitat
12 perspective, a lot of those I think -- a lot of those
13 cultural resources flow from the ecology and a healthy
14 ecology.

15 MR. SIEMANN: Is there any unique sort of
16 mitigation or compensation that could or should flow to
17 the tribes because of their unique relationship with
18 ecology?

19 THE WITNESS: I think so. I think in like
20 the Portland Harbor NRDA there's lamprey projects and
21 things. I don't know if there was evidence of injury
22 found in lamprey, but there was certainly some
23 mitigation projects developed for that purpose. I think
24 that's reasonable.

25 MR. SIEMANN: Thank you.

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1 JUDGE NOBLE: Any other council questions?
2 Questions based upon council questions?

3 MR. KERNUTT: I just have a short follow-up.

4 RECROSS-EXAMINATION

5 BY MR. KERNUTT:

6 Q. You referenced the literature in regards to
7 studies of long-term impacts to population, fish
8 population.

9 What about -- do those studies include studies
10 of resident fish like bass, for example, to your
11 knowledge?

12 A. I can't think of any offhand, but I know in the
13 Patuxent River spill -- (Court Reporter interruption.)
14 Patuxent, P-a-t-u-x-e-n-t, there's a lot of resident
15 fish in there in the Chesapeake system. Typically when
16 you're looking at all the resources that are there, the
17 resident fish are very important components because
18 they're not just swimming through the pulse. If there's
19 residual oil, they're living in it.

20 Your sturgeon would be a big concern because
21 they're bottom feeders, and in the Mobil Oil spill
22 there's evidence of PAHs in sturgeon.

23 Q. Do you believe there's enough studies in the
24 literature to determine or conclude that there is no
25 impact to populations to resident fish in relation to

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1 oil spills?

2 A. I think there's reasonable certainty that the
3 evidence is pretty limited, if there is any. Again,
4 never say never, but I've worked on over 70 oil spills
5 and I just haven't seen long-term population effects for
6 fish. I could be wrong, but for the most part, I
7 typically don't see it.

8 MR. KERNUTT: Thank you. Those are all the
9 questions I have.

10 JUDGE NOBLE: Any other questions based upon
11 council questions?

12 REDIRECT EXAMINATION

13 BY MR. JOHNSON:

14 Q. Mr. Challenger, in your experience working in
15 the natural resource damages area, are tribes generally
16 actively involved?

17 A. Yes.

18 Q. And are they not trustees?

19 A. Yes, they are.

20 Q. So they're natural resource trustees?

21 A. Yes.

22 Q. Does that give them any special voice in the
23 process?

24 A. Absolutely. It gives them an equal voice.

25 MR. JOHNSON: Thank you.

1 JUDGE NOBLE: Is that it, Mr. Johnson?

2 MR. JOHNSON: Yes, Your Honor.

3 JUDGE NOBLE: All right. Well, thank you
4 very much for your testimony, Mr. Challenger. You are
5 excused as a witness.

6 We're at the end of the day, and
7 Mr. Johnson, we have one more witness that was on your
8 list, but I'm assuming that you would be wanting to call
9 that witness at a later time? No pressure. (Laughter.)

10 MR. JOHNSON: I was going to say yes, but
11 only if you turn the music back on. (Laughter.)

12 No, Your Honor, we'll schedule the witness
13 for Monday.

14 JUDGE NOBLE: So that means we should talk
15 about the Monday witnesses. You said Keith Casey will
16 be on at 9:00 a.m. on Monday?

17 MR. JOHNSON: That's right, Your Honor.
18 Mr. Casey is coming out from San Antonio, and you'll
19 recall that he didn't prepare any prefiled testimony.
20 He is a witness we're presenting -- a fact witness we're
21 presenting based on council questions related to
22 financial assurances, the management committee, the
23 joint venture, and other corporate type issues. So he
24 will present testimony.

25 Then Greg Rhoads will testify. Mr. Rhoads

1 is testifying -- he did provide prefiled testimony.
2 He's testifying regarding rail incident response and oil
3 characteristic issues. And we'll work on the primary
4 rebuttal piece of this.

5 And then Brian Dunn, same witness we had
6 scheduled for today, to discuss rail crossings. We
7 don't anticipate that testimony to take a long time, but
8 we will have to take Mr. Casey at a minimum first.

9 That's all we have scheduled, Your Honor,
10 and we anticipate at that point that we will conclude
11 our case-in-chief. We will be reserving -- well, with
12 the exception of Mr. Barkan who you will recall is
13 coming in at the end of the case, and then we'll be
14 reserving the remainder of our time for
15 cross-examination and our rebuttal case, any witnesses
16 we have to put up in strict reply.

17 So that's where we think we're headed.

18 JUDGE NOBLE: And could I ask if the
19 opponents will be presenting some testimony if we get
20 done with that?

21 MS. REED: Your Honor, we discussed that if
22 we have time on Monday afternoon we might -- no?

23 MS. BOYLES: We had discussed whether or not
24 we could get somebody here for Monday afternoon or play
25 the prerecorded testimony on Monday afternoon. That is

1 a little bit up in the air now because I want to be able
2 to get Ms. Harvey on the phone at the same time as her
3 testimony. So right now, I would prefer to say that
4 we're starting Tuesday morning. We're still pushing
5 people forward as we speak.

6 JUDGE NOBLE: All right, good. We'll plan
7 for that then. Thank you.

8 Is there anything else we need to do either
9 on or off the record before we adjourn for today until
10 Monday morning at 9:00? There being nothing, we are
11 adjourned. Thank you.

12 (Proceedings adjourned at 5:02 p.m.)
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