BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVALUATION COUNCIL

In The Matter Of: Application No. 2013-01 TESORO SAVAGE, LLC VANCOUVER ENERGY DISTRIBUTION TERMINAL	)))) Case No. 15-001)))

HEARING, Volume 5

Pages 923 to 1217

ADMINISTRATIVE LAW JUDGE CASSANDRA NOBLE

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June 30, 2016

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PROCEEDINGS

JUDGE NOBLE: Back on the record on the State of Washington Energy Facility Council, Case No. 15-001, in the Matter of Application No. 2013-01 Tesoro Savage LLC Vancouver Energy Distribution Terminal.

This morning -- it's 9:00, and we are -- council is not in the room yet and we are going to go through the exhibit list, and the parties have been successful in coming to agreement on many of the exhibits and I really commend the parties for their hard work on that. And so we're going to go through the exhibit list and get the agreed exhibits admitted.

After that I am going to rule on the objections to the prefiled testimony of the witnesses Holmes, Johnson and Millar and rule on whether or not those witnesses may testify with regard to the objections that have been made.

So first, on the exhibits, I want to make clear -- in my ruling, I said the draft EIS would be excluded from evidence as it is the council's product, and I want to make sure that it's clear that that is Exhibit No. 51 excluded, and No. 4, the PDEIS, preliminary draft EIS, is also excluded for the same reasons. And, again, that is the council's product.

But to the extent that various documents were responsive to data requests from EFSEC staff in the process of preparing the draft EIS or the PDEIS and it is strictly the product of Tesoro Savage or someone else, then that's appropriately in evidence, as it is not the council's product.

So we have several exhibits that fall into that category, starting at Exhibit 5, and from -- it's my understanding, there's no objection now to any of the exhibits in this range that I'm going to give you. From Exhibit 5 through Exhibit 66, with the exception, of course, of 51, I don't see any objection to those exhibits by the parties and all of those exhibits will be admitted.

MR. DERR: Thank you. Your Honor, I don't know how you want to deal with questions. Do you want to deal with them chunk by chunk or wait till the end?

JUDGE NOBLE: Let's just do chunk by chunk so that we can --

MR. DERR: So if I can ask one question on the PDEIS and I unfortunately realize my list -- the printer ran out of paper, so I'm missing the number. I think it's 4.

JUDGE NOBLE: That's 4.

MR. DERR: That document was prepared by the

applicant and submitted to EFSEC, and then EFSEC took whatever it wanted to of that document to work on the DEIS. So that was an applicant consultant prepared document. I just want to make sure you understood that before ruling that that's really an EFSEC document. It was a document prepared by the applicant.

JUDGE NOBLE: That is true. I understand that. And I understand the -- all the process is, but technically, all the EIS documents are the product of the council. I think we have a rule that says that, something like that. And that makes it -- that makes it not relevant to this process because the adequacy of the environmental review documents are not at issue.

But various submittals, as I've said, photographs and exhibits that were prepared and presented to EFSEC in preparation of the PDEIS or the DEIS or the FEIS can come in as they relate to your case. That's the nuancing part of this ruling. But the documents themselves are actually products of the council.

MR. DERR: And one more clarification. So those -- if our consultant prepared a document and used it to comment on the draft EIS or used it to submit with the PDEIS, our consultant can use that analysis to support their testimony?

JUDGE NOBLE: Yes. Yes, this is strictly your product.

MR. DERR: But if our consultant used an analysis that was in the DEIS that they did not prepare, then that's a reference to the DEIS analysis that they should not use. Is that -- is that the nuance? I'm just trying to think ahead for some witnesses I've got coming to get them right on how they do this.

JUDGE NOBLE: So you're talking about some kind of research or product that some expert prepared and your expert is using that as a basis for -- a starting basis for their analysis?

MR. DERR: Yeah, I'm speaking specifically about EFSEC's experts that they hired through the Cardno ENTRIX team to prepare the draft EIS. So they hired a series of consultants that none of the parties used. We couldn't. And so the question is, if a witness wishes to testify based on that analysis, which is DEIS analysis that none of us prepared, does that fall within the nuance of what we're --

JUDGE NOBLE: That does fall within that. However, just a reference to that as a context or a starting point for another analysis, just a mention of it would not be improper because there would -- you would not -- the analysis wouldn't make sense unless an

expert was able to say where they started.

MR. DERR: So they can say --

JUDGE NOBLE: Their analysis was with reference to what? It would hang in thin air and not be logical. Does that help?

MR. DERR: I think. I'm going to try one more example, because I think this may help everybody as we get ready. So let's say the DEIS -- I'm going to pick a random number, says, okay, the answer to this question is 55, and there's a whole analysis that's done by an EFSEC consultant to say it's 55. And then the witness says, I didn't do any analysis, but because it's 55, here's the consequences of 55. But it's really relying on the actual analysis, the work and the draft EIS, not just saying the EIS looked at this topic; it's saying, I'm taking the EIS analysis and I'm offering my testimony based on the conclusion of that analysis. I don't want to be argumentative. I'm just trying to get clear --

JUDGE NOBLE: No, you're not being argumentative. You're asking a legitimate question. The emphasis just cannot be on the product of the EFSEC -- of experts, and the testimony can't be strictly critiquing the EFSEC product. It has to be the -- your expert's testimony and conclusions. But they have -- I

understand that they have to start some place, and they're starting with a given analysis, and several of the expert -- several of the witnesses we've had so far have mentioned the DEIS, said they don't agree with it, but here's what they think, and that's what would be proper.

MR. DERR: Okay.

JUDGE NOBLE: Does that help?

MR. DERR: I think -- and if we end up with an example we're not clear, somebody will object or --

JUDGE NOBLE: They will.

MR. DERR: -- ask a question and then you can help us again.

JUDGE NOBLE: I know how hard it is. But it's just that I'm trying to make it clear that EFSEC's products, PDEIS, the draft EIS, the final EIS, are not relevant evidence because it's their product.

MR. DERR: Thank you.

MS. BOYLES: Your Honor, I have a question about the -- just the -- the versions of the application that came before the most recent application, which are PCE's 2 and 3, I believe, Exhibits 2 and 3.

JUDGE NOBLE: Yes.

MS. BOYLES: So of course, a lot of the expert testimony -- all of the expert testimony relies

on those versions because it came before the final version, which is Exhibit 1, and a lot of places they're the same, but there are some places where it's different, and so it's on the exhibit -- they're on the exhibit list. I don't think anybody has reproduced those documents because there're tens of thousands of pages to do. So I don't -- I just sort of functionally don't know what to do with that issue. Because it is in the witness testimony.

MR. JOHNSON: And just so you know, Your Honor, the way this went was -- because I think it's important you understand the background. We did work very closely to try to iron this out, and the position we took was, okay, we agreed to this list of common exhibits, and we -- what we said was, then the individual parties that want to put those into evidence can do so. So from the applicant's position, what we did is we said, look, we're going to only rely on the most current version, which we knew was coming because -- you know, but we didn't know when, and so we put a placeholder in for the May -- for the revised application and then kind of left it up to others if they wanted to put -- actually reproduce, put those prior versions into -- you know, into the record, to do that. So that's why we didn't reproduce everything in

those prior applications.

But Ms. Boyles is correct that just because -- with regard to those exhibits, while they are listed here, they aren't actually physically here, if that makes sense. The only application that you have in a binder or that Ms. Mastro has in her computer is the most current version, which is the May 2017 application.

MS. BOYLES: And let me be clear, I'm not faulting you-all for --

MR. JOHNSON: Yeah, I don't think -- I just wanted -- sorry. I just wanted you to understand how this all kind of came about. And also I think it is critical that you understand that just because some of these exhibits are listed here, they're not actually here.

JUDGE NOBLE: Well, the revised application isn't here either. In fact, I think the arrangement was that we wouldn't require another copy to be produced as one of the five we had as the record copy.

MR. JOHNSON: We reproduced it. We Bates stamped it and it -- Ms. Mastro has it and it comprises a number of the binders behind you that we gave you in hard copy. We provided both -- two copies. So the 2017 application is here.

JUDGE NOBLE: Well -- all right.

MR. JOHNSON: And I might add, it is -- it comprises much of what -- when we refer to Exhibit 1 and then the page number, which we've been doing --

JUDGE NOBLE: Yes.

MR. JOHNSON: -- that is the 2000 version of the 2017 -- or the May 2017 application that's in the record. And I moved for admission of that right away. So it's --

JUDGE NOBLE: Right.

MR. JOHNSON: You've already admitted it.

JUDGE NOBLE: Okay.

MR. JOHNSON: Sorry for that long explanation.

MS. BOYLES: All I want to make sure is that for the clarity of the record and for the witnesses' testimony that gets put in which is referring then to a document which does not exist in the record but does exist on the EFSEC website, that there's no issues there, especially if there's a difference between the one version -- the earlier version and the version which is admitted as Exhibit 1.

And because Tesoro Savage knew they were producing a new exhibit, it shouldn't be the burden of the parties who relied on the application that was available at the time to produce the exhibit again. I

mean, I'm just trying to do a production issue is all.

JUDGE NOBLE: Right.

MS. BOYLES: Nobody, frankly, has the wherewithal to get that exhibit produced again and it's on the website. So I just -- I just -- I know certain witnesses, all they talk about will be Exhibit 2 and 3. And if a year hence people look for Exhibit 2 and 3, there is no Exhibit 2 and 3. And so that's my only concern.

JUDGE NOBLE: As long as they're clear what they're referencing -- in addition to saying Exhibit 2 and 3, if they can be clear about what it is that they are talking about. I imagine -- there's lots of things that refers to things that are not in the record as a basis for their conclusions.

MS. BOYLES: I just want to make -- it's not really an objection. It's just -- I'm just worried about how we're going to think about this when we've all forgotten this morning.

JUDGE NOBLE: I think it's going to be a comment on the witnesses to be clear about exactly what they're referring to.

MS. BOYLES: I'm sort of channeling some other people here, so let me stop doing that.

JUDGE NOBLE: What I'm thinking about is

subsequent -- in a subsequent PO, if there's a reference to a document that has been replaced with a newer document. We know that now and so when the witness is testifying it seems like it would be a good time to make it clear what exactly they mean when they say "the application."

MR. HALLVIK: Taylor Hallvik for Clark County. Clark County has witnesses that have prepared testimony and reports and prefiled, one of which will not be testifying except for council questions at the -- during these proceedings, Dr. Peterson. And his report lists out the documents that he relied upon to inform his understanding of the scope of the project, among them, the DEIS, the PDEIS, which Clark County understands will not be an exhibit to these proceedings, but also lists the application that was operative at the time and prior to May 27th.

So for that reason, and because Clark County doesn't believe there'll necessarily be a prejudice to any party or the proceedings, we would ask that the -- we have listed the exhibit in our submissions; we would ask that it be admitted --

JUDGE NOBLE: That what be admitted?

MR. HALLVIK: Both the prior applications -- the prior versions of the application, and that they can

stand on their own as exhibits.

JUDGE NOBLE: You don't have to answer this now. Let me rule on that next week. And the reason I want to rule on it next week is because I would like you to be clearer about why you think that the entire previous applications need to be admitted, and what would be the lack of clarity specifically, that the witness is referring to something that was in the previous application that apparently is not in the current application? Is that what you're saying?

MR. HALLVIK: Yes, it is. My understanding is the application grew by several binders between 2014 and 2016. And because it wasn't available until after it was due --

JUDGE NOBLE: I understand that part. I'm just -- the witness' is apparently testifying with reference to something that's no longer in the current application.

MR. HALLVIK: I don't have examples like that. I have a general reference at the beginning where the expert in their report states all the documents that they reviewed to inform their understanding of the scope of the project. The document that is an exhibit, the May 27th, 2017, application, didn't exist at the time he wrote that. And so --

JUDGE NOBLE: I understand that. But what I'm saying is that I think the witness' testimony will be clear without having those previous applications in the record. A lot of experts and witnesses testify about the bases of their conclusions, and the bases for their conclusions are not always in the record, often not. They can just describe what they relied on and what they're testifying about, treatises and authorities and all that, and it doesn't necessarily have to come in as an exhibit.

MR. HALLVIK: I understand. Based upon prehearing briefing I -- I can get -- I can work on getting you that next week.

JUDGE NOBLE: And if you just give me some clear reason why you think that it's necessary for a -- the council and a reviewing court to have the entire previous document in the record to understand your witness' testimony, then why don't we hear that next week so that I can rule on it then. Give you a chance to --

MR. HALLVIK: That's fine.

JUDGE NOBLE: -- develop that.

MR. HALLVIK: Thank you, Your Honor.

JUDGE NOBLE: Okay. And please remind me. I'll try to make a note of it too. But remind me we

need to give you a ruling on that.

MR. HALLVIK: Thank you.

JUDGE NOBLE: Thanks. I didn't give the other parties a chance to respond to that, but we'll do that --

MR. JOHNSON: No, Your Honor, and I think we should -- is my mic on? I think we should move on. But just to be clear, we don't have any objection, if ultimately people feel they need those prior versions in and they want to go through the effort of reproducing all that, and that's a lot of paper, it's very costly, and so if they want it in, no problem, as long as they, you know, want to do that and you want that in the record.

JUDGE NOBLE: No, I understand that. But I'm also concerned about the record and that it be accurate and not confusing and not impossible to absorb by those that are making decisions based upon it. So possibly we can address the problem in another way.

MR. JOHNSON: Okay.

JUDGE NOBLE: Okay. Here we are. So through Exhibit 66 are all admitted. Then the exhibits -- Tesoro's exhibits start with Exhibit 101, and I have from 101 to 112, with the exception of Exhibit 110 which I haven't had a chance to review yet.

It was -- that 110 was BNSF's comments in response to publication of draft EIS. TSDT is a title I have for that exhibit.

MR. JOHNSON: I'm sorry, Your Honor, did you say you don't have a copy of that exhibit?

JUDGE NOBLE: I do. I just haven't had a chance to read it.

MR. JOHNSON: Oh, I'm sorry. Okay. I see.

JUDGE NOBLE: So I don't want to admit that at this time before I --

MR. JOHNSON: So you're reserving a ruling on it?

JUDGE NOBLE: Yeah.

MR. DERR: Your Honor, the other plan, if this helps you as you figure it out, that's also attached to the prefiled testimony of Ms. Dava Kaitala from BNSF. So that's -- it has its own exhibit number because we gave numbers to the attachments, but it's in the --

JUDGE NOBLE: That's right. And we needed to do that, so I appreciate that. But I need to refresh my recollection about that. I think it's probably admissible, but I just want to be sure. I just made a note that I needed to reserve on that one.

Other than that, those exhibits from 66 --

excuse me, from 101 to 112 are all admitted.

I have an objection on Exhibit 113, and we'll -- I assume -- I assume that that's still a viable objection, so we'll hear oral argument on that later, once it's offered.

MS. REED: Yes, Your Honor, the City of Vancouver objects.

JUDGE NOBLE: All right. So we won't hear argument on that now. I'm just trying to get the agreed exhibits into the record.

From Exhibit No. 114 through 123, there's no objection on any of those exhibits and they will be admitted.

I have objections on Exhibits 124, 125. I'm reserving on those. They haven't been offered yet.

MS. BOYLES: Your Honor, those -- I believe those have -- that is what Mr. McDougal did the telephone foundation for yesterday. They have been admitted.

MR. JOHNSON: That's correct.

JUDGE NOBLE: Oh, I'm sorry, they have. But we don't have Exhibit 126 that's admitted yet, I don't think. And there's no argument about 126, no objection?

MS. BOYLES: No objection.

JUDGE NOBLE: That's admitted. Already

admitted now are the exhibits all the way through without exception to 146; those are already admitted. And then I have a series of objections on Exhibits 147 through 153, which we'll deal with later.

MR. JOHNSON: Can we just confirm with Clark County -- Taylor, did you --

MR. HALLVIK: Yeah, those were -- I think we communicated --

MR. JOHNSON: I think they've withdrawn their objection to both -- to that --

MR. HALLVIK: Well, yeah, 132 through 153.

JUDGE NOBLE: All right. 132 has already been admitted. I didn't realize there was an objection on that.

MR. HALLVIK: There was -- there was not. I communicated to counsel for the applicant that prior to the start of the hearing but after this joint list exhibit -- exhibit list had been filed, that we had reached an agreement -- or we -- Clark County would stipulate to 132 through 153, so that's probably why there wasn't a -- it was indicated that there was no objection when 132 was entered.

JUDGE NOBLE: Okay. Good. Then the Exhibits 147 through 153 are admitted. The other ones are already admitted.

I don't have an objection to Exhibit 154, but that looks like it is part of the DEIS appendix, and I'm going to reserve on that because I need to take a look at it again.

Exhibit 155 -- now, there are quite a few, all the way through -- the Tesoro Exhibits 155 through 185, all seem agreed and they'll be admitted.

And then I have objections noted on 186 and 187.

188 is agreed. That will be admitted.

There's an objection on 189 -- two objections.

And 190 will be admitted. That's agreed. Has not yet been admitted and it is now.

191's already been admitted.

There are objections on 192 and 193.

194 has already been admitted.

And then the Exhibits 195 through 204, there's no objection on any of those. They're all admitted.

There is an objection on 205, which we'll deal with later.

And Exhibits 206, 207, 208, no objection. They will be admitted.

209 is already admitted.

There's an objection to 210. Reserve on that.

And there are objections all the way through Exhibit 220, although three of those have been admitted. And my records show 216, 219 and 220, and also -- yeah, and 220, those, although there were objections, they've been admitted, and 221 and 222 were admitted. There was no objection.

Exhibits 223 through 227, no objection has been noted. Those will be admitted.

228 has already been admitted.

Exhibits 229 and 230, there's no objection. They will be admitted.

There are objections to 231 and 232.

There are no objections to 233 through 237. They will be admitted.

Exhibit 238, there are objections.

Exhibits 239 through 243 have no objections and will be admitted.

There is an objection to 244.

245 is already --

MS. CARTER: Your Honor, actually --

JUDGE NOBLE: You need to speak a little bit louder. The court reporter didn't get what you said.

MS. CARTER: Columbia Waterfront withdrew

its objection to 244. I think it was a typo.

JUDGE NOBLE: Thank you. 244 is admitted.

245 was admitted already.

Exhibits 246 through 248 have no objection and will be admitted.

There are objections to 249 through -- excuse me -- 249 and 250, so we'll deal with those later.

Exhibit 251, no objection; it will be admitted.

And there is an objection to 252.

MR. HALLVIK: Clark County withdraws its objection to 252.

JUDGE NOBLE: 252 will be admitted.

Exhibit 253 will be admitted. There is no objection.

There are objections to 254 and 255.

256 is not objected to; it will be admitted.

257, there are objections.

258, 259, there are no objections. They will be admitted.

260 has objections.

261 --

MR. DERR: Your Honor, I'm sorry, I'm backing up, if I can, for a minute. Because I thought

we addressed with Mr. Carrico's testimony 255. That's in his prefiled testimony -- that's a reference in his prefiled testimony. And the same with 254. He didn't -- he didn't --

JUDGE NOBLE: I thought we did too. Let me just check on that.

MS. BOYLES: I don't think they were moved.

MS. BRIMMER: They weren't moved.

MR. DERR: But he didn't speak to every document in his prefiled testimony. So I guess that may have been my error to move -- to move those exhibits. There was no objection to his prefiled testimony or its contents when we filed the expert witness objections.

MS. LARSON: Columbia Waterfront withdraws its objection.

JUDGE NOBLE: To 255?

MS. LARSON: 254 and 255.

MS. BOYLES: Same for Riverkeeper.

JUDGE NOBLE: All right. 255 and 254 will be admitted. Thank you.

Exhibit 256 has no objection. It will be admitted.

257, there are objections.

258 and 259 will be admitted. There are no objections.

There are objections to 260.

And then 261 through 269 have no objections. They will be admitted.

270 is just a blank placeholder number.

And there are -- there were objections, but 271 and 272 have already been admitted.

273 through 277 are admitted. No objections.

278 has been admitted already.

279 there is an objection -- two objections.

280, 281, 282 have no objections. They're admitted.

283 through 286 have already been admitted.

Is this going too fast?

MR. DERR: Your Honor, I'm sorry, I was checking something else.

JUDGE NOBLE: Okay.

MR. DERR: So 283 was previously admitted.

JUDGE NOBLE: Yes, as was 284, '85 and '86.

MR. DERR: That's what I missed. Thank you.

JUDGE NOBLE: There were objections, but they were --

MR. DERR: Thank you.

JUDGE NOBLE: 287 and 288, no objections. They will be admitted.

289, 290, 291 have previously been admitted.

292 is admitted. There were no objections.

And 293 and 295 -- I'll get to 294 in a minute. 293 and '95 are prefiled testimony, so they're not exhibits. They will be with the transcripts as testimony. So I am calling those withdrawn.

MR. DERR: That's fine.

JUDGE NOBLE: And then the CV of Kristin Wallace, 294, no objection. That will be admitted.

296, 297, 298, no objection. They will be admitted.

299 through -- through 306 are all admitted. There was no objection.

MR. DERR: Your Honor, the -- some of those are prefiled. Did you want to do the same thing?

JUDGE NOBLE: I'm sorry. Thank you. Yes. Yes, I do. 300, 301, 303, 304, 306 are withdrawn. Sorry. They are testimony and they will be part of the testimonial part of the record.

307 is one I have to reserve in order to study it a little bit more, as it appears to be part of the DEIS.

And there are several, now, exhibits that are actually testimony. And all of those that are testimony are withdrawn. And I just -- I'm going to be

skipping over some numbers. So I think that's just the easiest way to do it. Here are the testimonial exhibits that -- proposed exhibits that are going to be withdrawn: 308, 310, 312, 315, 317, 318, 320, 321, 323, 325, 327, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356 and 358 are all withdrawn.

And then going back to the other exhibits to be admitted. 309 -- there's been no objection to the following exhibits and they're admitted: 309, 311, 313.

I need to withhold -- excuse me, reserve my ruling on 314. I believe -- I don't think it will be a problem, but I need to look at it again.

316 admitted, 319, 322, 324, 326, 328, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357. And I don't know if I got to -- I think I said that 358 was withdrawn.

359 is already admitted.

And then 360 through 362 are admitted. No objections.

363 there are -- through 365, there were objections, although Vancouver was reserving its objection to 365.

Does Vancouver maintain an objection to 365?

MS. REED: Yes, Your Honor.

JUDGE NOBLE: 366 through 369, no objection.

They will be admitted.

MS. BOYLES: Your Honor, we actually have an objection to 366, but I think it's -- have you withdrawn it?

JUDGE NOBLE: I can just withhold ruling on that till you find out.

MR. DERR: Is that the models?

MR. JOHNSON: That was in -- related to the motion on the models which has now been resolved. It seems to me it doesn't need to be a declaration at this point because it was -- it was part of the motion, in response to a motion.

MS. BOYLES: It's just it was -- I'm not sure why it was an exhibit anyway.

MR. JOHNSON: I don't know either.

JUDGE NOBLE: We'll withdraw it.

MR. JOHNSON: Yeah, I think we can withdraw it. Let's just withdraw it.

JUDGE NOBLE: 366 is withdrawn.

And so 367, '68 and '69 are all admitted.

MR. DERR: Your Honor, can I ask a question about 364? I see you reserved it. That actually was a document that was included in response to the preemption motion because -- I can't even remember now which one -- but some party cited some of the preemption arguments

from Benicia, and we then offered the other arguments from Benicia, but it's really about the preemption motion, and maybe it's already a pleading and therefore it doesn't need to be an exhibit. No one is here testifying on that.

MS. REED: And, Your Honor, that was the basis of our objection, was that it was the subject of the motions.

JUDGE NOBLE: So do you want to withdraw 364?

MR. DERR: We can withdraw it. We'll withdraw it.

JUDGE NOBLE: All right. I think I said that 370 was already admitted. If I didn't, I'm saying it now.

Now we're into the -- we're into the Port's exhibits. There are no objections between 1001 through -- oh, there are only two Port exhibits, I see, 1001 and 1002, there's no objection. Those will be admitted.

And then we are back to Tesoro exhibits.

MS. BOYLES: No.

MR. JOHNSON: No, Your Honor.

JUDGE NOBLE: Do we have a problem with -- I think we have an extra page. Technical issues with the

printer. Sorry.

MR. DERR: That's all right. We were just saying we hope you didn't read the exhibit list twice to make your rulings.

JUDGE NOBLE: Really, really admitted.

Okay. We have Port exhibits now from 1001 through 1010. And there's been no objection to any of those. Those will all be admitted. '10 -- '11 has been admitted already, that is, 1011, and as have 1012 and '13. And there's been a withdrawal of 1014 and a withdrawal of 1016.

And 1015 has been admitted.

And 1017 through 1022 have already been admitted.

And then we are coming to 10,023 [sic] through 10,036 [sic] are all admitted. There's been no objection. Excuse me, did I say 10,000? It just feels that way.

MR. DERR: We're not going to get there. We promise.

JUDGE NOBLE: 1037, there's an objection.

1038 through 1042, no objection. They'll be admitted.

1501 through 1503 are admitted. There's been no objection.

2001 through 2011, no objection. Those are admitted.

2501 through 2505 are admitted. There's been no objection.

There are some more withdrawals of testimony. I assume they're withdrawals and I'll just say what those are. 3001 --

MS. REED: Your Honor --

JUDGE NOBLE: Am I losing somebody?

MS. REED: Your Honor, I -- is that on?

JUDGE NOBLE: Is it green?

MS. REED: No.

JUDGE NOBLE: I think we can hear you.

MS. REED: Oh, okay. Your Honor, I had a question about the withdrawal of the prefiled testimony for the City of Vancouver. Three of those, we attached the CV to the end of the testimony rather than making it a separate exhibit, not realizing that we were going to do it differently. So would Your Honor prefer that we introduce those as new exhibits at the end of our list, or just maintain that same exhibit but take the testimony part out and leave the resume in?

JUDGE NOBLE: I think the latter might be good. Just use that number that you have, but we probably need to be really clear on the record what that

exhibit is. So maybe we should skip over those numbers and do that later.

MS. REED: If we could. Thank you, Your Honor.

JUDGE NOBLE: So just tell me what -- it would just be all of Vancouver's testimony that we'll deal with later?

MS. REED: Yes. Thank you, Your Honor.

JUDGE NOBLE: So in between those testimonial proposed exhibits, we have Exhibit 3003, which will be admitted. There's no objection.

And I'm going to try to speed this up. I will admit everything that has no objection without saying that. Anyone should chime in if I'm wrong about that. So the following exhibits will be admitted: 3003, 3005, 3008, 3011, 3014 and 3015, 3017, 3018, 3019, 3020, 3021, 3022, all admitted.

Exhibits 3023, 3024 and 3025 have objections.

3026 is admitted.

3027 and '28 have objections, as does 3029.

3030, 3031, 3032, 3033 has no objections. Will be admitted.

MR. BARTZ: Excuse me, Your Honor. This is David Bartz for the Port of Vancouver. Our objection to

3032 is withdrawn.

JUDGE NOBLE: There's also an objection by Tesoro to 3032. Is that --

MR. DERR: No, Your Honor.

JUDGE NOBLE: So you're -- if there was one, you're withdrawing it. 3032 is admitted.

MR. JOHNSON: We didn't have an objection to 3032, Your Honor.

JUDGE NOBLE: Okay. That's just an error. Okay. Thank you.

And there was 3033. Does the Port maintain its objection to '33?

MR. BARTZ: We didn't have one to '33, Your Honor.

JUDGE NOBLE: All right. That's in error. All right. 3033 is admitted.

And there are -- I have a Tesoro objection to 3034 through 3040. Is that still correct?

MR. JOHNSON: Yes, Your Honor.

JUDGE NOBLE: And 3041 through 3049, no objection. They will be admitted.

3050 looks like a part of the draft EIS. Looks like a scoping report for the draft EIS, which is an EFSEC product. I don't know if you want to make argument about that, but I'm not admitting it. But I

don't want to preclude your ability to argue about that.

MS. REED: Your Honor, could I reserve as to whether we want to argue that one?

JUDGE NOBLE: Yes.

MS. REED: Thank you.

JUDGE NOBLE: Okay. We will take up 3050. Don't let me forget to do that. Thank you.

3051 will be admitted.

And could I ask the City of Vancouver about 3052 -- I believe that is a City of Vancouver product -- it's just a letter in response to the scoping; is that right?

MS. REED: Yes, Your Honor.

JUDGE NOBLE: There's no objection to that. That will be admitted.

Exhibit 3053 is admitted.

3054 appears to be part of the draft EIS.

MS. REED: Yes, Your Honor, it is. We'll withdraw that.

JUDGE NOBLE: You're withdrawing it? Okay.

And then 3055 is admitted. There is no objection.

3056 appears to be a City of Vancouver product.

MS. REED: Yes, Your Honor.

JUDGE NOBLE: And there's no objection. That will be admitted.

MR. DERR: Your Honor, can I just add. Earlier there were other DEIS comments of BNSF, for example, that you said you needed to review. So are you admitting some of the DEIS comments of the parties but not of the witnesses? Is that --

JUDGE NOBLE: No, I just said I needed to take a look at it, that I couldn't recall if it was strictly a product of the party or the witness or if it was somehow part of the draft EIS. I just wanted to look at it.

MR. DERR: Okay. All right.

JUDGE NOBLE: That doesn't mean I'm not going to admit it. I just need to look at it again.

MR. DERR: All right. Thank you.

JUDGE NOBLE: 3057 through 3067 are all admitted.

Could we go off the record for a minute, please.

(Recess taken from 9:56 a.m. to 9:56 a.m.)

JUDGE NOBLE: We'll go back on. Thank you.

MR. BARTZ: Dave Bartz for the City of Vancouver, Your Honor. On Exhibit 3059 -- I'm sorry, Port of Vancouver. We're all one big happy family.

For the Port of Vancouver USA, on Exhibit 3059 if, I might, I would like to reserve our review of that. I just reread the title and it didn't click that we didn't object to that and I thought we had. So it says we haven't and I would like to reconfirm that.

JUDGE NOBLE: All right. We'll reserve.

MR. BARTZ: Thank you.

JUDGE NOBLE: Does everyone have that, 3059 reserved ruling?

Okay. Where was I?

I think we had -- I think we were at 3077 through 3079. Well, let's just be sure. 3076 is admitted. There were no objections. But there were objections to 3071 through '75 by the Port. And the Port maintains its objections?

MR. BARTZ: Yes, Your Honor.

JUDGE NOBLE: All right. So we'll reserve on that.

And then 3076 will be admitted.

MS. REED: Your Honor, perhaps I didn't hear, but did you admit Exhibit 3069?

JUDGE NOBLE: Well, I meant to, if I didn't. It's admitted.

MS. REED: Okay. Thank you, Your Honor.

JUDGE NOBLE: And I think I just admitted '77 through '78, 3077 through 3079.

And then there are objections on 3080 and 3081.

3082 through 3108 are all admitted. There's no objection.

3109, there's an objection by the Port.

MR. BARTZ: Your Honor, we'll withdraw that objection on 3109.

JUDGE NOBLE: Thank you. 3109 will be admitted.

3110 is admitted.

And 3111 was a Vancouver Municipal Code, but I already -- we already took judicial notice of that. It doesn't need to be an exhibit.

MS. REED: That will be withdrawn, Your Honor.

JUDGE NOBLE: There's an objection to 3112 by Tesoro?

MR. JOHNSON: Yes, Your Honor.

JUDGE NOBLE: Exhibit No. 3113 is admitted. No objection.

32 -- 3114, 3115, objections.

3116, '117 are admitted. There's no objections.

There's an objection on 3118.

And 3119 through 3121 are admitted. There's been no objection.

MR. DERR: Your Honor, at least one of those is prefiled testimony again. 3119. So we're going to swap that out, I think is the plan.

JUDGE NOBLE: Yes, that's the plan. Thank you. I missed that.

There's an objection to 3122.

And then we have -- 3501 is a declaration of Einberger. Is that connected to prefiled testimony?

MR. DERR: That's the City of Washougal. I'm not sure they're here.

MS. BOYLES: That is a prefiled testimony, though? It says it is.

JUDGE NOBLE: Anyone speaking on their behalf today? Let's just reserve on that one.

And the other Washougal exhibits we have not been -- there has been no objection to 3502 through 3506. So those will be admitted.

And we'll deal with 3507, as it is prefiled testimony, the same way we have the other testimony; it will be redesignated and withdrawn. Although we don't have Washougal here to actually withdraw it, I'll withdraw it on their behalf, as the testimony will still

be part of the record.

And then 3508 will be admitted.

It appears to me that 4001 is part of the draft EIS, so it will be not admitted.

MS. LARSON: Excuse me, Your Honor. That is a Tesoro product. It was submitted with their application and again with their admitted application, but it was also reproduced in its entirety as Appendix O to the DEIS. It's all the same document.

JUDGE NOBLE: Okay. So it's an entirely Tesoro product?

MR. DERR: No, Your Honor, it's also -- the same report's got -- I think it's 156.

JUDGE NOBLE: It's a duplicate of 156?

MR. DERR: Yeah. Because we attached the three reports prepared by Mr. Schatzki as exhibits, and so then it looks like Columbia Waterfront wanted to use probably what's -- you might want to take a look, but I think it's exactly the same document.

MS. LARSON: It's the same report that he did in July 2014, right? It's all the same.

MR. DERR: Is that the primary one? 156. Yeah, Primary Impact Report, July 28th.

JUDGE NOBLE: 156 was admitted, so I don't think we need 4001.

MS. LARSON: Okay. We can withdraw it, then.

JUDGE NOBLE: Okay.

MS. LARSON: Although, Your Honor --

JUDGE NOBLE: If you want to look at it --

MS. LARSON: No, it's just that Mr. Johnson's prefiled testimony refers to it as Appendix O, so we'll just have to be really clear what we're referring to when he's testifying.

JUDGE NOBLE: All right.

4002 through 4010 are all admitted. No objection.

There's an objection to 4011.

4012 through 4014 are all admitted. No objections.

4015, there is an objection from the Port.

4016 through 4028 are admitted now -- are all admitted. I do notice that 4028 is an ordinance from the City of Vancouver, but it might be handy to have an actual copy of it in the record.

And then 4501 is testimony. That will be withdrawn.

4502 through 4507 are admitted.

MR. JOHNSON: Your Honor, could we stop for a minute. What was the testimony you just referred to?

I see 4028 is the ordinance.

JUDGE NOBLE: 4501 I have as direct testimony of Timothy Walsh.

MR. JOHNSON: It looks like we're missing that on our exhibit list.

JUDGE NOBLE: DNR exhibit.

MR. KERNUTT: Mr. Pruit is not -- I'm sorry. Matt Kernutt, for Counsel for the Environment. Mr. Pruit wasn't here. He did, previously when we prepared this, withdraw his prefiled testimony. So he's fine with that being withdrawn. It's withdrawn.

JUDGE NOBLE: So I think I said 4502 through 4507 are admitted. If I didn't, then I'm saying it now.

And then we have another testimony which would be a DNR, and that's Robert Johnson.

MR. KERNUTT: And when the parties prepared their list, that was withdrawn already as well.

JUDGE NOBLE: Withdrawn?

MR. KERNUTT: Yes.

JUDGE NOBLE: 4509, 4510 are admitted.

And then the Port has told me this morning that they have withdrawn their objections on exhibit -- and I want to make sure, Mr. Bartz, that I got the numbers right, 5001 through -- what I have is 5001 through 5099.

MR. BARTZ: I can make this simple for the record, I think.

JUDGE NOBLE: Excellent.

MR. BARTZ: Connie Sue Martin will make sure I'm right here too. The Port is withdrawing its objections, which we state as the double asterisk, for 5001 through 5099, and also withdrawing the double asterisk concerns expressed at 5105, 5110, 5181, 5182 and 5183.

JUDGE NOBLE: What about 518- -- you said 5180 as well?

MR. BARTZ: No.

JUDGE NOBLE: For 5180 --

MR. BARTZ: I thought I got organized.

JUDGE NOBLE: While you look at that, Mr. Bartz, I'll just admit Exhibits 5001 through 5099.

And then there are no objections to 5100 through 5104. Those will be admitted.

And 5105, the Port has withdrawn its objection. That will be admitted.

5106 I need to look at again.

MS. CARTER: They're comments on the DEIS.

JUDGE NOBLE: Right. That would be in the nature of a critique of the draft EIS and so --

MS. CARTER: Can I -- there's been several

DEIS comments that you have admitted back in here.

JUDGE NOBLE: And can you tell me whether they -- the comments are stand-alone comments or whether they repeat text from the draft EIS?

MS. CARTER: No, they're stand-alone. They were reviewed by several of our witnesses and technical folks.

JUDGE NOBLE: Okay. Well, then, we'll admit that. Thank you. Thank you for clarification.

Exhibits 5108 and 5109 are admitted.

5111 --

MS. CARTER: So 5110, what is the status of that?

JUDGE NOBLE: 5110 -- excuse me, 5110 had an objection from the Port.

MR. BARTZ: The Port's withdrawn that objection.

JUDGE NOBLE: And you have withdrawn that, so it's admitted.

And 5111 through 5160 are admitted. And now we come to 5180.

MR. BARTZ: That objection is withdrawn also.

JUDGE NOBLE: Is that the same, Mr. Bartz, with 5181?

MR. BARTZ: 5181, 5182 and 5183, the Port withdraws, no objection.

MS. CARTER: I noticed that we're beginning with our prefiled draft that we filed, and we can withdraw them. So beginning with 5200, we can withdraw those.

JUDGE NOBLE: Does the Port withdraw the objection to 5201?

MR. BARTZ: No, Your Honor. The asterisks there are about those testimony objections we haven't dealt with yet.

MS. CARTER: Right. And that's testimony. So we'll withdraw 5200 and 5201.

JUDGE NOBLE: All right. Those are testimony. Those exhibits will be withdrawn, as will 5202.

MS. CARTER: Correct.

JUDGE NOBLE: And 5205.

MS. CARTER: Yes.

JUDGE NOBLE: And I'll go back now. Sorry. 5202 is also testimony.

5205, 5206, 5207, 5210, 5213, 5217, 5220 are all testimony and they're withdrawn.

MS. CARTER: Correct.

JUDGE NOBLE: Going back to 5203, 5204, no

objection. They will be admitted.

And if that's the case, also admitting 5208, 5209, 5211, 5212, 5214, 5215, 5216, 5218, 5219 and 5221 -- I'm sorry. 5220 is testimony. That's withdrawn. But I still see an objection to 5221.

MR. JOHNSON: Your Honor, we're reserving on that objection but to -- and it will pend on the outcome of the rulings on the --

JUDGE NOBLE: That's fine. I'll reserve my ruling on that pending the arguments -- or withdrawal of the objection. And if I said '221 is admitted, I'm changing that now. It's not admitted at this time.

Then we have several where we have Tesoro and Port objections from 5222 through 5251 and we -- I will not be ruling on those today.

5252 is admitted. There's been no objection.

And then this series of 5300 to 5306 is admitted. All these are no objections.

5301 through 5322, admitted.

5501 through 5515 are admitted.

And 5516, I don't remember if we dealt with that in connection with testimony.

MR. DERR: Her testimony hasn't come up yet.

JUDGE NOBLE: I know. But with the -- dealt

with it in connection with the discussion of her testimony.

MS. BOYLES: No, we haven't dealt with it yet. It is like the others. It is her comments on the DEIS. It is wholly a work product of her, Ms. Harvey.

JUDGE NOBLE: All right. We'll deal consistently with that and that will be admitted.

MS. BOYLES: That is the same for 5520, which are the comments of Dr. Sahu.

JUDGE NOBLE: All right. 5520 is admitted.

5517 is already admitted, as is 5521.

5522 is admitted.

5523 is already admitted.

5524 through 5541 --

MR. JOHNSON: Your Honor, the applicant has an objection to 5525. We can reserve argument on that in the event that it's offered.

JUDGE NOBLE: I didn't have a Tesoro objection noted, but I will note that. So you said that you maintain that objection?

MR. JOHNSON: Yes, Your Honor.

JUDGE NOBLE: All right. 5525 is not admitted.

I don't remember where I started in my --

MS. BOYLES: Your Honor, you're on 5542 --

JUDGE NOBLE: Thank you.

MS. BOYLES: -- which we will withdraw for the same reason as Tesoro.

JUDGE NOBLE: You're withdrawing 5542?

MS. BOYLES: Yes.

JUDGE NOBLE: So 5543 through 5549 are admitted.

MR. DERR: Your Honor, 5543 is the same issue as the previous one.

MS. BOYLES: Yes. And we will withdraw that as well.

JUDGE NOBLE: Withdrawn. That's withdrawn.

5544 through 5549 are admitted.

And then there are objections to 5550 and 5551.

5552 and 5553 are admitted.

There are objections to 5554 and 5555 -- my apologies to the court reporter on that -- there are objections.

5556 is admitted.

5557, there's an objection from the Port. Is the Port maintaining that objection? I guess so. Is the Port maintaining its objection?

MR. BARTZ: Yes, we are, Your Honor.

JUDGE NOBLE: All right.

MR. BARTZ: Your Honor, I was trying to -- Fred Millar CV, I just didn't -- you haven't ruled on the objections to that testimony yet. I didn't know if --

JUDGE NOBLE: No, I was going to try to get to that this morning, but now I think we're going to go to testimony after this, which I don't want to have maybe some impatient council members waiting upstairs too long.

So you're maintaining your objection to 5557?

MR. BARTZ: We're maintaining the objection, Your Honor.

JUDGE NOBLE: All right.

MR. BARTZ: Your Honor, on this Fred Millar, it's not really my dog in the fight. I didn't know if we admit the CV while we're having dealt with the objection and testimony in order --

JUDGE NOBLE: I thought I just -- well, the objection, as I recall, to Millar's testimony was to certain portions of it, and so the CV would still be relevant and admissible.

MR. DERR: That's right.

MR. JOHNSON: We agree, Your Honor.

JUDGE NOBLE: So 5556 is admitted, if I

didn't say that already.

And now 5560 through 5580 are admitted.

5581 and 5582, the Port has objections.

5583 through 5600 are admitted. There are no objections.

5610, the Port has an objection.

And also 5611 through 5615, there are objections.

5620 through 5908 are all admitted.

5909 is not admitted at this time. There are objection -- there's an objection from the Port.

MR. BARTZ: Your Honor, the Port will withdraw its objections to 5909 and 5913.

JUDGE NOBLE: 5909 will be admitted.

5910 and 5911 will be admitted.

5912 has already been admitted.

The Port withdraws its objection to 5913. It will be admitted.

5914 through 5922 are admitted.

5923 has an objection from the Port. Do you maintain your objection to 5923?

MR. BARTZ: We'll withdraw that objection, Your Honor.

JUDGE NOBLE: It's withdrawn. 5923 will be admitted.

5924 through 5928 will be admitted. And I don't have any more numbers.

MR. JOHNSON: Your Honor, there is one issue to clarify. The City of Vancouver's Exhibit 3068 is a copy of the ground lease between the Port and the applicant, and I moved for admission of that the other day. You admitted it. Yesterday, when we were -- it was brought to our attention that some of the parties thought that the entire lease was included in the site application. Turns out it is not, and we went back and looked and it turns out that the lease that is Exhibit 3068 is also not a complete copy of the lease.

So what we would like to do would be to work with the City of Vancouver to substitute the entire lease so that it's -- every page of the lease is included in Exhibit 3068. So you've admitted the exhibit, but it doesn't include all the pages.

JUDGE NOBLE: Right. Well, it seems appropriate that it include the entire text of the lease, but I don't want to say that without hearing argument on that point. I don't know whether the City has any argument.

MS. REED: The City agrees.

JUDGE NOBLE: All right. So we'll just substitute -- make sure we get that substitute in on the

record.

MR. JOHNSON: We will do that, Your Honor. Thank you.

JUDGE NOBLE: Thank you.

Are there other exhibits that are -- other than those that come in the course of the testimony, that have -- that I've missed anything that hasn't been listed so far that we need to deal with at this time? All right, then.

And, again, I will -- the staff here is ready to compare its -- our list to yours at any time, and then we won't close the record until everyone is on the same page about these exhibits and is in agreement as to their status. I see people sitting at the table as if argument is about to come.

MS. LARSON: Oh, no. I was wondering if you were going to rule on the prefiled direct testimony of Jerry Johnson, which is relevant to --

JUDGE NOBLE: I was going to rule on that, and I'm thinking maybe we need to go get the council, but maybe we can just do it.

MS. LARSON: Okay.

JUDGE NOBLE: I think I'll just rule on the prefiled testimony of all three of the witnesses that I had planned on doing, just get it done.

With regard to Mr. Johnson, I -- it's my understanding that the objection to his testimony is that he has no experience assessing the crude oil market and that his sample risk analysis calculations were speculative and they were designated as explanatory purposes only, which was unclear and argue to be speculative, and opposing parties moved to -- Tesoro moved to strike several paragraphs of Mr. Johnson's testimony. And so I'm going to allow his testimony, but I'm going to require a little bit more in the way of foundation for certain portions of the testimony.

With regard to paragraph 13, the objection is sustained.

With regard to paragraph 14, I, on my own authority -- I don't -- paragraph 14 is not objected to, but I'm objecting to it. But I will allow Mr. Johnson to rephrase that paragraph with only his own analysis.

And that is the same for paragraph 15. And that relates to my earlier ruling concerning the draft EIS.

MS. LARSON: Excuse me, Your Honor, that's the same Exhibit 155 which is, in fact, the socioeconomic study that was submitted with the applicant's application. It's that reference to Appendix O that's, in fact, Exhibit 155.

JUDGE NOBLE: I'm getting his -- the paragraph I was referring to. The two -- what I'm suggesting to you, is that he rephrased that testimony in terms of just his own analysis instead of it being just a critique of the draft EIS.

MS. LARSON: And my point is, it's not a critique of the draft EIS. It's a critique of the socioeconomic study submitted by the applicant with its application. It's Exhibit 155. It was then reproduced in the DEIS in its entirety.

So if you go back to paragraph 8, we explain that what we're referring to as Appendix O is the analysis group's economic report prepared for the applicant, and then we go to the -- the cite refers to the application. I'm sorry that it's confusing and I can certainly rerun this prefiled now just referring to Exhibit 155, which has been admitted.

JUDGE NOBLE: Well, what I'll do, then, is make note when he does testify to ask him some questions about it, to make sure that those paragraphs express his professional views.

MS. LARSON: Thank you, Your Honor.

JUDGE NOBLE: All right. With regard to paragraph 16, the testimony will be allowed if the witness can support it with additional testimony

regarding the authorities he relied upon and also his own professional experience.

And that is the same with paragraphs 28 through 35. That testimony will also be allowed if it can be further supported as I just expressed about paragraph 16.

Paragraph 45 is speculative. It will be stricken.

Paragraph 49 will be allowed.

Paragraph 50, testimony, and also 51 and 52, will be allowed if the source and the basis of his analysis can be identified.

Paragraph 53 will be allowed except for the last sentence, which is speculative.

MR. DERR: I'm sorry, Your Honor, which paragraph is that?

JUDGE NOBLE: Fifty-three. That was one of the ones objected to. And I will allow it, except for the last sentence which I find speculative.

Paragraph 54 will be allowed.

Paragraph 55 will be allowed.

Paragraph 56 through 64 will be not allowed and stricken unless the witness can establish some qualifications regarding expertise in the oil market.

And now if you're ready, we'll move on to

the Holmes' testimony. The objection to Eric Holmes' testimony was that he did not claim any special expertise as to rail and traffic safety and that he summarizes the testimony of others.

I find that Mr. Holmes is merely agreeing with other testimony and that Mr. Holmes has been working as a city -- with the City of Vancouver since 2007 in economic development, as director and city manager since May 2010, the very city where this project is to be located. Can't be a city public official without thinking daily about traffic of all sorts. And I think Mr. Holmes is eminently qualified to testify about the City of Vancouver's issues with regard to this project, and so the objection to his testimony is overruled as to all portions of it.

MS. LARSON: Thank you, Your Honor.

JUDGE NOBLE: And then with regard to expert Fred Millar's testimony, the objection is that he is not qualified to assess risks of rail transportation. And overall, I find that he is an appropriate witness, but there needs to be more testimony as to his qualifications.

I understand that his actual degree is not -- was taken many years ago and that his experience is essentially the basis for his expertise.

Evidence 702 tells us that -- Evidence Rule 702 tells us that a witness can be qualified as an expert by, of course, knowledge, skill, experience, training and education, but -- and the case law's told us that it need not be formal education and it can be obtained through experience.

My standard from the EPA about admission of evidence in general is that it has to be the kind of evidence on which reasonably prudent persons are accustomed to rely in the conduct of their affairs, and I think that his experience is -- does meet that test.

And the only hesitation about his experience is the basis of it. And as I say, I think it's largely experiential from his different jobs that he's had over the years, but I do think it is of the type required by ER 703, reasonably relied upon by experts in a particular field in forming their opinions or inference upon a subject.

That said, I would like to see a little bit more testimony on his qualifications and, in general, testimony just filling in the length of time he has had working in the field. I realize it's many, many years of analyzing rail transportation specifically with regard to oil transport.

So I would like to hear more testimony from

Mr. Millar specific to state -- the state and safety of rail infrastructure, economics of the railroad industry and relative risks posed by specific industry operations and the preparedness of first responders and methods of response to incidents. I would like to hear him testify about his qualifications a little bit more. He will be allowed to testify, though.

MS. BRIMMER: May I ask a question, Your Honor? Janette Brimmer with Earthjustice on behalf of CRK parties. Would it be acceptable for us to submit that in advance, maybe as early as next week, because Mr. Millar does have to travel quite a distance and if, in fact, that additional submission would still not be adequate in the court's opinion, then we would prefer to save the resources that would be involved in bringing Mr. Millar in to testify? Would that be an acceptable procedure?

JUDGE NOBLE: I think that -- yes, you could do that. I'm still allowing him to testify because there are portions of his testimony that have not been objected to and that you'll have to judge for yourself whether -- whether it would be worth him coming up, because a large portion of his testimony has been objected to. I don't agree that those entire swaths should be stricken from his testimony, but I may not

allow him to testify to quite -- to those subjects in quite as much detail as he has, given that level of experience that he has expressed so far. His resume, as I recall, is rather a narrative form. And so I just think, in order to testify about those subjects, he has to be more specific.

So it's up to you whether you feel that the testimony that he's given that hasn't been objected to is sufficient to bring him out here. But I'm going to allow him to testify. I find him qualified under the evidence rules, but just as to those subjects that's the foundation for his testimony, on that, it's a little thin.

MS. BRIMMER: Thank you for the clarification. That helps.

JUDGE NOBLE: Thank you. So I think we've gotten through all the witnesses I'm able to rule on today and all of the preliminaries. And my goodness, it's 10:30 already. Time for the court reporter's break. So we'll be off the record for the -- let's say till a quarter of 11. Thank you.

(Recess taken from 10:37 a.m. to 10:54 a.m.)

JUDGE NOBLE: We're back on the record. I understand the parties were asking me about the paragraph that was stricken in Mr. Johnson's testimony.

That was number -- paragraph 48, not 45. Sorry if I said 45. I meant 48.

We're back on the record and ready for the next witness.

MR. DERR: Thank you, Your Honor. The applicant would like to call Mr. Todd Schatzki.

JUDGE NOBLE: Mr. Schatzki, would you raise your right hand, please.

(Witness sworn.)

MR. DERR: And, Your Honor, if I may, I would like to give Mr. Schatzki copies of prefiled testimony, since I'm at least learning it's hard to see it on the screen.

JUDGE NOBLE: Yes.

MR. DERR: And one other preliminary, Your Honor. I also have for the benefit of council, because I'm still not clear who has prefile of what or not, we'll be speaking to a table in Mr. Johnson's prefiled testimony and, again, when it gets up on the screen, I'm not able to see it. So I have hard copies of a page of Mr. Johnson's prefiled testimony that we'll be speaking to a little later. If I can offer that for council.

JUDGE NOBLE: Yes, you can. Thank you. You told me about that earlier, and I said it was fine to give council a copy. Thank you.

MR. DERR: Thank you. And I've also provided copies of that same page to counsel for the parties and intervenors.

JUDGE NOBLE: Before you get started, swearing in Mr. Schatzki reminded me that there was an issue about whether or not the prefiled testimony was adequately sworn. And the witnesses are all being sworn when they come in about the testimony they're about to give. Is there still an objection about the status of the prefiled testimony?

MR. JOHNSON: No, Your Honor. We just noted that because we went to extraordinary effort to ensure they were sworn before a notary -- notary public in accordance with the RCWs and you had emphasized the need to do that. So if they're being sworn now, we don't have any objection.

JUDGE NOBLE: That can be cured: All the witnesses could be sworn both to the testimony they're about to give and they have already given. So I'll do that.

MR. DERR: Thank you: I think we're ready.

TODD SCHATZKI,

having been first duly sworn,

testified as follows:

DIRECT EXAMINATION

BY MR. DERR:

Q. Mr. Schatzki, can you first state your name and spell it for the record.

A. Todd Schatzki, T-o-d-d S-c-h-a-t-z-k-i.

Q. Thank you, Mr. Schatzki. And the preliminaries on all the exhibits we'll be talking about have already been dealt with this morning, so we don't need to go through the various exhibits that we'll be talking about. They've been admitted.

So, Mr. Schatzki, did you prepare three reports regarding this project?

A. Yes, I did.

Q. And for the council's information, that would be Exhibit 156, called "Primary Impacts Report." Did you prepare that document?

A. Yes, I did.

Q. Exhibit 157, "Secondary Impacts Report." Did you prepare that document?

A. Yes, I did.

Q. And Exhibit 158, "Statistical Analysis of Property Values." The same?

A. Yes, I did.

Q. And what additional documents have you reviewed since your prefiled testimony to prepare for testimony

today?

A. I have reviewed the prefiled testimony of several witnesses, one, a Mr. Johnson; a second from Mr. Goodman. I have reviewed a number of the exhibits or attachments that were included with their testimony.

In reviewing their testimony and thinking about some of the issues they raised, I've gone and done some additional research and done -- you know, reviewed some additional studies that were, you know, publicly available.

Q. And just for -- again, for council's benefit, did you review the scoping letter from Jerry Johnson dated December 9, 2013?

A. The scoping letter being what was submitted as a comment to --

Q. As a comment, correct.

A. Yes, I have reviewed that.

Q. So that's Exhibit 5913. And then secondly, Exhibit 5909, "Predicted Impacts on Development and Redevelopment in Downtown Vancouver."

A. Yes, I have reviewed that.

Q. You mentioned already the prefiled of Mr. Johnson. And then Exhibit 4003, Columbia Waterfront, is a January 20, 2016, technical review by Mr. Johnson of the draft EIS. Did you review that

document?

A. I have, yes.

Q. And you mentioned the prefiled testimony of Mr. Ian Goodman. You reviewed that document?

A. I have, yes.

Q. Thank you. So I want to ask you first a couple of questions about Exhibit 156, your primary impacts report. Can you briefly describe the purpose and key conclusions in that report.

A. Right. So the purpose of that study was to evaluate the -- what we refer to as the primary economic impacts of the Vancouver Energy facility. What it's done is basically looking at the direct impacts of the facility in terms of the, you know, jobs it creates, the services and goods it purchases from the region and look at the kinds of economic impacts it has to the region as a whole.

It was performed with a model called IMPLAN, which is a very standard tool used for performing these sorts of impacts. It is based upon federal government data, largely from the Bureau of Economic Analysis, but also from a number of other agencies. It's a very standard appropriate tool that gives both geographically specific impacts, given the local economies, but also very -- has a lot of sectoral detail.

The key conclusions we came out of that study with was that the facility over an assumed lifetime of 16 years, so one year for construction and then an overlapping 15-year period of operations, would lead to some substantial benefits from an economic standpoint to the region.

The study area in this case is a ten-county study area that extends about a one-hour commute from the -- from the facility itself and that I understand is consistent with EFSEC guidelines about the kind of study area to look at.

The kinds of economic benefits, as I've said, are substantial; well, what does that mean? From a job standpoint during the construction period, that would lead to about 1400, 1500 jobs in terms of full-time equivalent jobs over that one-and-a-half-year period. On an annual basis thereafter, once the facility was at an assumed level of full operations, that would be about an additional thousand jobs, reflecting both direct activity at the facility, direct activity that is a result of, you know, the operations at the facility, and then a lot of what are referred to as indirect and induced effects, as that -- as those immediate direct impacts kind of ripple throughout the regional economy.

Looked at -- outside of jobs, in terms of

dollars, one way to look at that is a metric that's called value added, which is basically similar to -- you've probably heard a lot about gross national product. Well, that is kind of a regional measure of gross national product.

We found that on a nominal basis, it would produce about $2 billion, and in present value terms about $1.2 billion. And then about 80 percent of this would go towards labor income; the other remaining parts going to government revenues and to some extent to kind of, you know, business profits, local business profits.

Q. Thank you. I'm going to do a speed check with the court reporter. Sounds like we're doing okay. We want to be sure that the court reporter can catch everything you're saying.

THE WITNESS: Am I doing okay or too fast? Got it.

BY MR. DERR:

Q. I do the same thing, probably faster than you.

A. Yeah.

Q. Okay. Referring to Mr. Johnson's prefiled testimony, did Mr. Johnson comment on your evaluation of the primary economic impacts?

A. He made a number of comments in his prefiled testimony, yes.

Q. And can you respond to his critique?

A. Sure. Mr. Johnson, in response to -- you know, the primary impacts report has been put out, first, for a couple of years now. In his prefiled testimony, he identified what I'm going to summarize as four key conclusions. We reviewed them and found that I think they all -- I think originate from Mr. Johnson's misunderstanding of what we're doing and none of them affected our -- you know, my conclusions about what are the appropriate estimates and ways to do this.

So one of these was he raised issues that the 16-year period that we assumed for impacts was inappropriate. I think as I just said, that is clearly, from our standpoint, an appropriate conclusion. It reflects a ten-year initial period for the initial, you know, lease on the site. Understand Vancouver Energy has two five-year options. We assumed one of those five-year options would be acted on but not the second, so kind of a balance between the shortest operating period of ten years and the longest of 20. We also then, you know, in addition to that, there's one year of construction before any operations could begin. So a 16-year operations period seemed completely valid.

A second issue was he raised questions about the ways in which we modeled the economic impacts of

payments that go from Vancouver Energy to the Port of Vancouver. He suggested that there was a double counting in doing that.

There is clearly not a double counting. There may have been some confusion because the revenues to the port are listed with other expenditures that were going to be made by Vancouver Energy over time. There was then a reference to see the text for how that was modeled, and the text describes a process and I think Mr. Johnson kind of -- may have read the text in the -- you know, the text portion and read the table and thought that these were two separate accountings. They're, in fact, just one and it's only accounted for once.

The third issue relates to -- he indicated that we have overstated benefits because we've assumed that all of the jobs in the construction phase would originate from Clark County. Now, I'm going to remind you that our study area is looking at a ten-county area and we, somewhat just for convenience sake, assumed that they would all reside in Clark County. We could've assumed that they still would've resided in any mix of counties throughout that ten-county area. The impacts would not have meaningfully changed at all. And so that's not really, you know, in terms of the assumptions

we've made and the reliability of the estimates, that's a perfectly reasonable assumption.

The last issue he raised is he suggests that somehow that, you know, we have modeled the direct -- the so-called direct and indirect effects of -- inappropriately because we have confounded on-site jobs with off-site jobs. In his view that off-site jobs should be indirect.

In fact, that's not the case. All of the direct impacts of Vancouver Energy reflect both the jobs and the activity that it is doing on site and the business -- you know, the extent to which, you know, it uses businesses, goods and services in the community, and so therefore those are also direct impacts as well and those have been consistently modeled with the way implant studies are performed all the time.

Q. Mr. Schatzki, do you recall whether the -- you mentioned a one-hour radius for your study area. Do you recall whether that's specified anywhere as a requirement for the study area?

A. This is digging back. This may be related to -- so when we first started this project, there have been and may have been an environmental impact requirement or may have been an EFSEC requirement, but the idea that the study area should look at a one-hour

radius, I believe, is deriving from one of the regulatory requirements.

Q. Thank you. Mr. Schatzki, do you recall Mr. Johnson's statements in his prefiled testimony that the economic benefit of alternative use of the property should have been factored into your primary impact analysis?

A. I do.

Q. And in this regard I have a couple of questions.

First, in your experience, using the IMPLAN model -- and that's I-M-P-L-A-N, all capitals, as I understand it.

A. Correct.

Q. -- for evaluating economic impacts, is it typical to subtract calculations for potential benefits of an alternative use of the site?

A. Right. Well, not in the way that Mr. Johnson has proposed. What we've done in our analysis is basically looked at the benefits that the Vancouver Energy facility would create from the standpoint of comparing it to the status quo or kind of the business as usual state where that -- where the parcels there are basically going underutilized. And so the Vancouver Energy comes along and creates additional economic benefits. That framework seems appropriate given the

context here.

There may be circumstances when a given entity is comparing different alternatives to achieving an end, such as a government policymaker choosing between different policies or the port thinking about different uses of the port land. In that case, one might look at the impacts created by both. So in this case, you might go, oh, there's 1.2 billion in benefits from Vancouver Energy, an alternative gives you 500 million; you might in that context take the difference between those two to identify that, in fact, you know, one project, Vancouver Energy, produces more benefits than an alternative. But that's really in a situation where you're choosing amongst alternatives as being the criteria, which my understanding is not really the objective of what's going on here, which is to more focus upon what are the incremental benefits compared to a -- kind of the status quo. And so that's how we proceeded.

Q. Thank you. And I'm going to refer you to paragraph 10 of Mr. Johnson's prefile, but I'll read you just a sentence. So this is not the paper that I handed out, which we'll come to later. Mr. Johnson states, "While Tesoro claims the facility will support 176 on-site jobs when fully operational, the development will preclude alternative uses of the site which could

have a greater employment density and make more substantial contributions to the local economy."

So I'm going to ask you a couple of questions about that characterization. First, have you -- since reviewing his testimony, have you explored alternative uses of the property with the Port?

A. Well, I would say in the past, and more recently, I've had discussions with the port, for example, when I came and visited the Port several years ago, and recently talked with Alastair Smith, have discussed kind of the options and alternatives that might be available for use of those parcels.

Q. And did you review -- Mr. Smith testified a couple of days ago. Did you review the transcript of his testimony?

A. Yes, I did.

Q. So based on your conversations with the Port and your review of Mr. Smith's testimony, can you comment on potential alternative uses of property at the port and what you see to be alternative potential economic benefit?

A. Sure. And just to be clear, I -- you know, Mr. Smith is kind of more of the expert and more of a knowledgeable person in terms of the actual opportunities in the world and given the parcels.

There's a couple of things that came out of my conversations with him, and these actually came out of when I had visited the site several years ago, is that the port itself and the parcels that are being used there are -- in some sense, the Vancouver Energy opportunity represents kind of a unique use of what are three separate parcels that otherwise wouldn't have the greatest potential uses. And so just given there's kind of a synergy there between the offloading area, the area where the tanks are and the marine terminal, that, you know, kind of make -- is a unique way of using those parcels in a way that, you know, it basically provides a higher and better use than they otherwise would be put to.

It seems that the Port kind of also came to that conclusion, and one of the things that they also concluded, and Mr. Smith I know testified about this the other day, is that at the end of the day, the revenue streams that would come to the port for this option compared to other uses, and these could be, you know, other kinds of laydown projects or, you know, other kinds of uses of the port, would provide much higher revenues than those alternatives. And to the extent that those revenues which come to the port then basically get plowed back into the region in terms of

economic development, that then would also be greater economic benefits. And that does show up in the analysis that we did, because those revenues, those payments are part of the -- that 1.2 billion in value added that we looked at.

The other thing that jumped out, to me at least, was that Mr. Smith pointed out that, you know, these opportunities -- you know, this alternative is not a certainty. That is, you know we can hypothesize that there's another option that we would look at if Vancouver Energy didn't come; but the reality is we're not certain that would actually emerge and we're not certain that the other option that would emerge would provide such a large and long, you know, sustained kind of economic presence. You know, in particular, you know, the past efforts of the port to develop a Potash facility with BHP Billiton, and while I understand that's still a viable option, it seems that the efforts to bring in BHP Billiton as a particular entity has, you know, come close but not quite, you know, at this point, at least, it doesn't look like it's going to come to fruition. So, again, there's uncertainty in this that one needs to factor into that kind of economic prospects of alternatives.

The other thing I will note is that -- and I

think we'll come to this in a minute when we look at that exhibit, is that even when you look at what Mr. Johnson assumes for the magnitude of benefits from an alternative, he seems to also agree that that alternative would lead to lower benefits than what would come from Vancouver Energy.

Q. Thank you. So, Mr. Schatzki, I am now going to draw your attention to page 8 of Mr. Johnson's prefiled testimony, which is a separate paper I handed out, or you can look at it in that volume.

MR. DERR: If you could pull up -- it's prefiled testimony. I think everybody has the paper, but if there's anyone in the audience that wants to see it, it would be page 8 of the Jerry Johnson prefile; there's more than one Johnson, I believe.

BY MR. DERR:

Q. What basically I'd like you to do, Mr. Schatzki, is to sort of walk the council through the subtractions that Mr. Johnson proposed in his testimony and explain your thoughts on the appropriateness of those subtractions.

A. Sure. Happy to. And I'm going to start with the construction impacts and work my way down through the operations. I'm going to start with just the places where he's made numerical adjustments.

So the first adjustment is this adjustment for overstatement. One can look down at the note below, but basically this seems to be an adjustment that he's made for the fact that we've assumed during the construction phase that half of the -- that all the construction employees would come from Clark County, as opposed to them being spread throughout the study area.

As I said earlier, that really -- that assumption is pretty immaterial to the results. Regardless, he makes an adjustment basically diminishing employment and income, labor income by half, which is, from my standpoint at least, just a completely arbitrary assumption. There's no foundation for that half adjustment. And as I said earlier, there's no validity for even making an adjustment to begin with.

The next two relate to impacts associated with changes in property value as a result of changes in rail traffic because of the facility. So I think we're going to talk about this more momentarily, but, basically, I think -- I find that those estimates he has to be overstated. And in the context of the Spokane County estimate, those are actually outside of the study area, the ten-county area, and so it seems imbalanced to me to include them on -- as a reduction, while the fact that the study area only includes ten counties. Had we

expanded that study area to look at all of Washington state or, you know, to include portions of Oregon state, those numbers would have been larger as well.

The next estimate is this impact of alternative uses of the property. And this -- we were just talking about that. I just note that here, whereas we find economic benefits on the construction phase of about 124.8 million in value added, he, in terms of the amount to net off for this alternative, finds benefits of, I guess, 49.9 million. So he seems to suggest that that alternative benefit itself would be lower than the benefits that would come from Vancouver Energy.

Again, he doesn't -- I'll make this one comment in general. He doesn't provide much backup or substantiation for his assumptions, so I'm not quite sure what went into his calculations in doing that.

Moving down now to the operations phase, we have an adjustment for overstatement again. In this case this seems to be based upon this idea that somehow employees' work that is generated by Tesoro Savage is a result of off-site workers is not somehow -- has somehow a different or much lesser impact than workers who work on site. As I said momentarily -- you know, earlier, that is just not a valid criticism.

The other thing I'll note is that the adjustment

he makes for that is quite large and not substantiated. It's about more than three-quarters of an adjustment in terms of the annual operating benefits.

Moving down, impact on Clark County and Spokane; this seems to be a carryover of the property value adjustments that were identified above. He doesn't provide much explanation, but these seem to me to be a bit of a double count in the sense that up above, the property value impacts, as I understand them and as they're done in the literature, really are one-time impacts to the value of a property, to then kind of carry over and identify there to be an additional annual benefit going forward, you know, just, you know, without a substantiation, strikes me as a double count. If one thought about this as a commercial property, you know, if you -- you either derive benefits from the commercial property by rental payments, or you derive that value by selling that property; to kind of assume that there's impacts in both cases is kind of, you know, taking from both hands.

And the last feature, again, is the alternative uses, which, as we discussed earlier, not a valid reason in this context if we're looking at the status quo difference.

The one thing I will note, that to the extent

that, you know, you do think, well, it might be reasonable to look at the world -- you know, a world in which that alternative does go on, it's important to remember that if we -- if we had a world where you looked at that alternative and you then compared it to the Vancouver Energy alternative, that would lead to a negative benefit. So as much as you might look at 133 million and think, oh, we want to take off 20, remember that then you're in a world where you're kind of not asking, are we going to do something or nothing; you're asking are we going to do A or B? And in this case, you know, Vancouver Energy would lead to larger benefits than this alternative.

Q. Thank you. Mr. Schatzki, you've undertaken a couple of analyses to evaluate potential impacts to property values from the proposed Vancouver Energy terminal.

A. Correct.

Q. Can you briefly describe what you did?

A. Sure. And before we do -- so we've done a couple of analyses, and those analyses both focused upon this notion that as there's increased rail traffic, there's a disamenity associated with it and that leads to a reduction in property values, and there's been a lot of literature focused on that.

Before I dive into that, though, I do want to just point out to the council that an important dimension of -- an important impact, it's getting much less attention here, is the fact that when there is new economic activity in a region, that tends, all else equal, to increase and raise property values. So if we have -- you know, compare major cities, like San Francisco, against, you know, places that are facing depressed economic conditions, we see a big difference in property values there that are largely driven by the demand in the economic activities and what it does to raise property values. And to some extent you would see that here as well, and that's, you know, confirmed by a lot of economic analysis and statistical work.

So before we dive in and focus on the one narrow question about the disamenity that's associated with more trains going by, I think it's important to remember that there is this overall economic benefit to the region and that, all else equal, will tend to raise property values across a wider region than simply in -- proximate to the rail corridor.

Q. So, Mr. Schatzki, let me just stop you. So I want to see if I can connect the dots. So you earlier mentioned, I believe, as you summarized your IMPLAN work, practically $1.2 billion of valued added to the

local economy from this project?

A. Correct.

Q. So is that what you're saying, that's the -- the prospect of bringing $1.2 billion to the community, is that what you're referring to as having a potential positive effect on property values?

A. That's exactly it. I mean, if you think about it, that 1.2 billion -- or 2 million over 15 years, you know, 80 percent of that is going to labor. Labor then has more money to plow into housing, and you basically are raising demand for housing services. All else equal, that will raise property values.

In fact, often in these -- in the context of these hearings, one of the concerns is that you have -- in smaller towns where you have big projects, you have to worry that, in fact, you're going to have a lot of workers come and they're going to raise rental rates so much that, you know, there's going to be hardship in terms of access to a reasonable and affordable housing. And that's not a concern here, given the nature of the size of Vancouver as a community and the size of Vancouver Energy. But nonetheless, that same effect, that same relationship is there and important to think about.

Q. So did you add anything to your positive side of

the ledger for potential increased property values from that economic activity?

A. No. No, we have not attempted to quantify that fact.

Q. Do you recall, did Mr. Johnson add any positive property value benefit from that economic activity in his analysis?

A. I do not remember him doing that, no.

Q. Thank you. Let's turn to what you call the disamenity effect.

A. Yeah.

Q. Can you talk about the work that you did to try to evaluate the potential disamenity effect on property values?

A. We did two things, basically. So one is we went and looked at the existing economic literature to see if there were studies out there that we could do -- what I'll call just a value or benefit transfer, so to take the values that were estimated in another context and kind of transport them to Vancouver Energy -- I'm sorry, to Vancouver, to see if -- what the impacts would be like here. And in doing that, what one needs to do is go out and look for studies that really identify an impact that is comparable to what you're studying here. So it needs to be comparable in terms of the kinds of

communities and the nature of the impacts.

And so what we really looked for, because the rail is existing here, we looked for studies that could inform us about the change of an increase in rail traffic and how much an increase would affect property values, as opposed to just the question of whether or not being near to a rail line affects property values. Because the rail line's there, and what we're really talking about are incremental changes above an existing level of rail traffic and how that would affect property values.

The other thing we did was a statistical study of actual property values in Vancouver going back to about 2007 and going over the period of time when the announcement was made about the Vancouver Energy facility to see whether or not the relationship between being near to the facility changed after the Vancouver Energy project was announced, to see whether or not there was kind of a shock about, oh, my God, this facility's coming, we want to move, let's, you know, see if -- you know, let's sell the properties, and whether or not we saw a drop in property values.

Q. And I'm going to pause you just a second. For council's benefit for later review, Exhibit 157 is called the Secondary Impacts Report, and I believe that

one contains your literature review?

A. Correct.

Q. And then Exhibit 158, is this statistical analysis of property values. And was that the one that contained this actual analysis that you did of the Vancouver market?

A. That's correct.

Q. So I'm going to make you stick with the secondary impacts first.

A. Okay.

Q. We'll talk about that a little bit, and then we'll move from there.

So tell me a little bit more about the literature search that you did and what you found.

A. So we looked at the economic literature. It's called a hedonic literature. It's a very standard economic approach, statistical approach. We identified a lot of studies that looked at rail impacts, but only two that provided information on the kind of marginal impact of increases in rail traffic on property values. This is one study in Los Angeles near the Alameda rail corridor. It's a big rail corridor that goes through the center of Alameda County. And the second one is one in Cleveland. And basically we looked at those studies, we looked at the statistical results and we then, you

know, looked at the rail traffic that was going to be here and we then, given the expected level of rail traffic and those kind of what are called marginal effects, identified what would be the likely marginal effects, assuming those values are accurate, to -- in Vancouver Energy, given potential increases in rail traffic.

Q. So just to make sure I'm clear, the studies -- the two studies you mentioned were studies that looked at increases of rail traffic as distinguished from rail traffic generally?

A. One -- so they provided information on -- what they did was, they identified how property values changed depending upon the level of rail traffic. So they make that -- they do draw that distinction. Most only look at the value of being near to -- or the impact of value on being very close to a rail line as opposed to being far away from it. So it's kind of an either/or in most of the studies.

Q. And do you recall, for council's benefit, roughly the range of property value impact you identified in those two studies?

A. So taking those values from the studies, you know, thinking about potential increases in traffic of four trains a day, we came to a range of zero; in other

words, in some cases these studies found no statistical relationship between increases in rail traffic or changes and the value of properties, and on the other hand at the high end, up to 1.5 percent, given the assumed four trains per day.

Q. And to clarify, were those studies looking at rail transport of hazardous materials specifically or rail traffic generally?

A. They were looking at general rail traffic, so this included probably some mix of hazardous and nonhazardous. It probably varied depending upon, you know, time and location.

Q. Did you find any studies that addressed crude by rail traffic specifically?

A. None, no.

Q. Any other studies you identified that addressed hazardous material transport?

A. There was one study we identified that looked at transport of spent nuclear waste in South Carolina. This was a situation where you had -- there was some Atoms for Peace program that had resulted in a proliferation of energy -- nuclear energy across the world, and this is a program that we had an obligation -- "we," the US, had an obligation to bring all that waste back to the US. And it was a

circumstance where all that waste was going to be brought to the Savannah River on a nuclear facility and brought through Charleston in South Carolina. So there's one study that looked at that.

We ended up not relying upon that study, for a number of reasons. One is that this was such a unique and very politically contentious situation in South Carolina. You had a situation where people were, you know, discussing this being the nuclear dump of the world, and, you know, there was a lot of upset and worry about it. So for that reason, we -- and, you know, just in general, I think our view is that, you know, the kinds of fears and anxieties associated with nuclear waste really weren't comparable to what is kind of the incremental hazard from moving, you know, an additional four trains a day compared to 28 trains a day and some of them being a mix of existing crude by rail, some of them being other hazards. It just seemed to be kind of apples and oranges to us. And so on that basis we didn't look at that.

The one thing we did note, though, was the study actually found different effects depending upon the location. So the train would go through a couple of communities and one it only went through a port -- a couple of trains, and in those cases the property values

counterintuitively actually went up. In another city of Charleston, which is the major city, that the property impacts did go down, they found. In another city closer to where the actual Savannah River facility was, in that county, the property values actually -- there was no statistically significant impact. So one thing the author -- the study authors did was speculate that as you get closer to where the actual, you know, economic activity is that's associated with the -- you know, where the waste is going, that there can be potentially a positive amenity associated with that, as in there's economic, you know, activity jobs associated with that. And so, you know, that was another factor that basically, I think, led us to kind of not -- you know, not be quite sure what to do with the study but also to recognize that the implications of having something that was perceived as hazardous coming through the city varied a lot, depending upon both the nature of the waste and the location.

Q. Thank you.

MR. DERR: And, Your Honor, I believe you already admitted it, just for reference, that's Exhibit 4015. My recollection was those got admitted with the big swath this morning. And they're actually Columbia Waterfront's exhibits.

MS. LARSON: I believe the Port has an objection to that exhibit.

MR. DERR: Oh, excuse me. Then I will not -- I will not offer the exhibit, and I'll rather offer the witness' testimony that he looked at it, and you can decide if you want to -- I thought the Port withdrew their objection to that this morning, but I may be misremembering.

JUDGE NOBLE: No, they maintained their objection is my note.

MR. DERR: All right. My apologizes.

BY MR. DERR:

Q. So I want to move on to your statistical analysis of property values, Exhibit 158. And that one I do believe we admitted this morning. Can you describe sort of the purpose of that study and briefly what you did there.

A. I don't want to repeat what I said earlier, but basically the goal was to -- after having looked at this and recognized there was some concern by some people involved in the proceeding about property value impacts, we realized that people knew that the potential that the facility would be developed had -- was coming, it was in the past. And so we just naturally asked ourselves the question, well, why don't we go look at the data and see

what the data is saying about the extent to which we see any kind of change in property values as a consequence of the fact that there's a potential that this facility is coming and that, you know, there's an alleged, you know, disamenity associated with it.

So what we did was, I think I said earlier, went and collected data on property values that were -- came out of basically property transactions. We also collected the kind of data you do in the statistical analysis, you have to control for all the characteristics of the house, both the neighborhoods where it is, the number of square feet, the number of bedrooms and bathrooms and things like that, because those can cause variation in housing values.

What we did that was kind of unique to this study but similar to some of this other literature, is we looked also at and identified how far each property was from the rail line, and we then, you know, when we went to look at the time in which the property transaction was made, took special note of whether or not it happened before or after the announcement.

And in the statistical analysis, we basically looked at that, what is often kind of thought of as a discount for the property for being close to the rail line, and saw if that changed after the facility was

announced.

So, for example, say that there is on average, all else equal, a 10 percent reduction in a property value if you're very nearby to the rail line and that is a kind of baseline level before the facility's announced. We then look after the facility's announced to see what's happened to that discount; is it the same or has it changed? So if it was still at 10 percent, we would look at that and go, well, nothing seems to have changed and so the announcement of the facility doesn't seem to have an adverse impact on the property values.

If, however, that discount went up to 15 percent, you would say, you know, aha, that means that we maybe can associate that change in property values with the announcement and we might have some causation that we could attribute.

In fact, when we did the study, what we found was that there was really no statistical change in that premium or discount to living in proximity of the study, and we did that both assuming that that discount -- that change in discount looked -- you know, was uniform over the 24 months of data we had after the project's announcement. We also kind of looked quarter by quarter to see if there was any trend in it. In other words, there might have been a big impact initially but then

people changed their minds; there might have been a small impact and as inflation grew, you know, you might have seen, you know, more concern. In fact, we kind of saw nothing. And in the recent period, if anything, those -- that premium has been positive in the sense that the premium or the discount to living nearby to the rail line has gotten smaller.

Q. So, Mr. Schatzki, have you -- I believe you testified earlier that you have reviewed various analysis and comments from Mr. Johnson going all the way back to December of 2013, as the project got started and the EIS was being scoped, through his prefiled testimony. And I would like to start with Exhibit 5913, which is an early scoping comment that Mr. Johnson submitted. Do you recall that comment and what Mr. Johnson stated as the expected percent decline in property values from this project?

A. So I just want to be sure I'm referring to the first one. There were two -- referring to the correct study. He did two studies around the same time. One looked at the waterfront specifically and one looked at downtown development -- you know, kind of change in growth in development downtown. Are you referring to the former?

Q. The first one that referred to the Columbia

Waterfront development specifically.

A. Got it. Okay. And I'm sorry, what was the question again?

Q. Do you recall what Mr. Johnson stated as the expected adverse impact on property values at --

A. Yeah. So at that time, Mr. Johnson put together a study where he looked at the change in what he called in development yield of the waterfront project as a result of the Vancouver Energy project getting developed, and he, in his analysis, assumed a 30 percent reduction in development yield as a result of the project.

Q. And what was the explanation for that assumption?

A. There was no explanation. It was simply an assumption. There was no support for it.

Q. Based on what you know of this project and the work you've done, do you see any basis, in your opinion, for a 30 percent reduction in property values?

A. I haven't seen any evidence that would support a 30 percent reduction.

Q. Does Mr. Johnson continue to rely on this value in any of his subsequent analysis or comments?

A. So in his comments to -- hoping I get my chronology right. So there were comments submitted in

response to the DEIS. In that, he provided a table, similar to the one that we just referred to that was handed out to everyone. In that prior table, he included a line in which he included an adjustment for the waterfront project based upon that study.

MS. LARSON: Objection, Your Honor. They're testifying to a document submitted on the EIS which goes to the adequacy of the EIS, which we have not offered as an exhibit.

MR. DERR: Your Honor, I'll refer you to Exhibit 4003 --

MS. LARSON: Well, okay, maybe we've offered it as an exhibit. But in accordance with your -- what my understanding of your ruling on what this adjudication is about, that it is not about the adequacy of DEIS.

MR. DERR: You want me to respond?

JUDGE NOBLE: You can if you want to.

MR. DERR: I assume she's objecting to the question. The exhibit, as I understand it, was admitted.

JUDGE NOBLE: Yes.

MR. DERR: So this is a statement in that exhibit. It is -- my question relates to whether Mr. Johnson carries forward what the witness has

testified to as unsupported assumptions throughout the rest of his analysis. That's the purpose. I'm not asking for commentary on the EIS analysis at all. I'm asking for accuracy of Mr. Johnson's commentary on the EIS, which was admitted.

JUDGE NOBLE: Is there any response to that?

MS. LARSON: Yes. That exhibit was offered but not referred to in his prefiled direct testimony and, in fact, the 30 percent number is not referred to at all in his prefiled direct testimony. So this would be beyond the scope of his prefiled direct testimony.

MR. DERR: But within the scope of Mr. Schatzki's expertise to comment on expected property value impacts in this area.

MS. LARSON: But it has not been offered as testimony in this adjudication.

JUDGE NOBLE: You mean this testimony he's about to give hasn't -- is not properly part of his direct examination?

MS. LARSON: Mr. Johnson, in his prefiled direct testimony in the adjudication, does not refer to a 30 percent property reduction number. And, in fact, he looks at a range of property reductions from 1.5 percent to 7 percent. The only person who has talked about the 30 percent number is Mr. Schatzki.

MR. DERR: Your Honor, this goes -- in part goes to credibility of their witness, who keeps changing his number as the process --

JUDGE NOBLE: I don't want to go there.

MR. DERR: The exhibit's been admitted, and I would ask that the witness be able to comment on the exhibit.

JUDGE NOBLE: I am going to allow the testimony because he is allowed to comment on -- for his own conclusions on other research that he has seen and make an analysis. And also that exhibit was admitted. And so I think the thrust of this is this witness' analysis, as opposed to the content of the direct testimony.

MS. LARSON: Thank you, Your Honor.

MR. DERR: We're moving off that exhibit and that point to the next question.

BY MR. DERR:

Q. So, Mr. Schatzki, now I would like to refer you to Mr. Johnson's prefiled testimony, particularly paragraphs 36 through 47, where he talks about what he believes will be adverse impact on property values from the project at the time of that testimony. What approach does Mr. Johnson use in that prefiled testimony to estimate property value impacts?

A. So in this case, he uses, in principle, an approach similar to what the literature review approach that I referred to earlier. He goes out and looks at the literature to identify -- try and identify values that are comparable to the circumstances that are at issue here.

In this case, what he does is he actually -- it seems honestly that we've looked at many of the same studies, but instead of just focusing on studies for which there is a change -- for which the studies provide information on the change in property values associated with a change in rail traffic, he focuses on studies that provide information on the change in property value associated with being near to the rail line or being very far away from the rail line. And that simply just doesn't seem to be what's at issue here.

The houses -- you know, the Vancouver Energy facility is not creating a rail line; it's not moving the rail line; it's just going to be incremental traffic on top of the existing rail line. And so those aren't the right studies to be looking at and aren't the right values to be taking to the issue here.

Q. Do you recall approximately the values that Mr. Johnson used as compared to the values that you identified in your secondary impacts report?

A. Right. So he uses values from 1.5 percent to 7 percent. As I said earlier, the values I found, based upon our research, were zero percent to 1.5 percent, as a maximum.

Q. Actually, I just want to take you finally down to Mr. Ian Goodman's prefiled testimony. Did you review his testimony?

A. Yes, I did.

MR. DERR: And in particular, for council's benefit, a lot of Mr. Goodman's testimony is about, sort of, oil market issues. I asked Mr. Schatzki, there's a section about sort of impact -- socioeconomic impacts on local communities from projects.

BY MR. DERR:

Q. And to be clear, Mr. Schatzki, is that the portion of his testimony that you reviewed?

A. Correct.

Q. So Mr. Goodman, in his prefiled testimony, makes a statement in paragraph 32 that says, "Technical analyses in many jurisdictions have shown that the cost and risk of hosting such facilities exceed and often greatly exceed their economic benefits."

Can you -- have you reviewed the studies that he mentions and can you comment on that statement?

A. I have reviewed the studies. I'm not sure if

it's that statement that you read or others, but I was struck at by how Mr. Goodman was identifying that all the studies -- it points -- makes statements that suggests that all the studies uniformly come to the conclusion that the costs were very large and the benefits were very small. And that struck me as surprising, so what I did was I looked out in the literature, and for three of the projects, the Energy East project -- and these are all pipeline projects, by the way, they're not crude-by-rail projects. So the Energy East Project, the Trans Mountain Expansion Project and the Northern Gateway Project, they're all Canadian pipelines. And actually, we found there were many other studies that came to the opposite conclusion. They concluded that the benefits were greater than the costs. These included analyses that were performed by the National Energy Board, which in -- for two of the three cases -- only two of the three projects have actually been ruled on. In both cases, the Natural Energy Board ruled positively that -- and gave approval of the project.

So you kind of get a very different impression about the scope of the -- you know, of the different analyses that are out there and the extent to which they come to one conclusion or another when you kind of look

at the full scope of the literature and the studies that have been done, as compared to when you look at Mr. Goodman's, which conveys the impression and points strongly that says all the studies come to the conclusion that the benefits are far smaller than the costs.

Q. So, Mr. Schatzki, I want to make sure I wasn't referring you to a paragraph that you didn't have in mind. So let me ask you that -- Mr. Goodman's prefiled testimony is there in the notebook.

MR. DERR: If we could pull up Mr. Ian Goodman's prefiled testimony, paragraph 231.

BY MR. DERR:

Q. Sounds like that's the paragraph or that's the comment that you were explaining. And I want this to be your explanation, not mine.

A. Yes. So actually I may just have misheard you. It's the point where he says, "Technical amounts each regarding economic benefits and costs of energy logistics facilities," and then he says, "consistently conclude." And it's the "consistently conclude" that I guess I take objection to. I don't think they consistently conclude. When I went out and looked, I found many other studies that came to the exact opposite conclusion. And so I just want to be sure the council

is aware that there's a very -- you know, there's a -- out there, you know, for these three studies that he looks at, that there are other studies that come to different conclusions, The National Regulator has come to a different conclusion, the Congress Board of Canada has come to a different conclusion. And so Mr. Goodman's really kind of being rather selective in the studies that he's presenting in his testimony compared to what's out there.

BY MR. DERR:

Q. And, again, so I'm clear, the other studies you're referring to are other studies for the same projects that Mr. Goodman was referring to?

A. For the same three projects that I mentioned earlier, yes.

Q. Thank you. Finally, I don't believe I asked you this at the beginning, did I ask you to review, at least briefly, a natural resource damage report that was prepared by ABT and submitted in the prefiled testimony by Counsel for the Environment?

A. Yes, you did.

Q. And for the council's benefit, that's Exhibit 1503, which was admitted; pretty sure I got that one right this morning.

So do you -- and I'm not going to ask you to

comment on the calculation of the damages, but I would -- I did ask you to review the estimate -- the total estimates that were contained in that report. Did you do that?

A. Yes, I have.

Q. And do you recall approximately the amount of damages to both the fisheries and the natural resource damages that were identified in that report?

A. Right. So I remember for the -- for an accident of a large tanker, there's going to be about 200 million in total, reflecting, I think it was 37 million in impacts to commercial and recreational fisheries, and I think about 171 for natural resource damages. There's also another number, somewhat smaller, for the rail car accident. I don't remember the particulars in terms of the national resource damages associated with that.

Q. Do you -- so now I'm going to flip you back to Mr. Johnson's commentary. He had in his table a -- sort of an unquantified subtraction for potential risks or impact, and that's on that separate single page that I handed out, page 8. Do you agree with -- first, do you agree with his argument that these -- if these natural resource damage and fisheries damage numbers from ABT -- let's take them for purposes of argument as a reasonable number to assume; do you agree that those totals should

be subtracted from the benefit numbers?

A. Not as this table's represented here.

Q. And why is that?

A. Well, as it says here, it's an environmental risk hazard. So the question is, if you have a certain impact, you need to think about what's the likelihood that that happens, and that's an important dimension of any kind of risk analysis, is to not only think about the impacts that happen should an accident occur, but to think about the likelihood of those accidents. That's kind of a standard approach to risk analysis.

Q. Okay. And then just lastly, for sake of argument, if you were to subtract those numbers from your estimate of local economic benefit, how would -- or would that change your conclusion about the overall net economic benefit to the community?

A. That in and of itself would not change. I mean, I think actually the best way to look at it would be to look at Table 4, where you kind of are comparing that impact against, say, the $1.2 billion in value added. You don't quite see that here in this table because we have an annual benefit which happens over 15 years and a kind of year-and-a-half benefit from construction impact. So it doesn't -- that contrast doesn't kind of quite pop out at you the way it does when you compare

the kind of -- the present value of that stream of benefits that's going to happen over the project's lifetime. That caveat aside, yes.

Q. So that -- to clarify, if you look at your total estimated project benefit of 1.2 billion and if hypothetically you were to subtract this number, you would still come out with -- what would you come out with as a net economic benefit?

A. You could come up with about -- well, at least a billion dollars, though if that benefit -- if that accident happened many years into the future, you need to discount it, so it would be a bit smaller. So at least a billion dollars in benefits still.

MR. DERR: Thank you. No further questions, Your Honor.

JUDGE NOBLE: Cross-examination?

CROSS-EXAMINATION

BY MS. LARSON:

Q. Good morning, Mr. Schatzki.

A. Good morning.

Q. Linda Larson, counsel for Columbia Waterfront LLC. I'm going to walk you through the same three studies that Mr. Derr walked you through. I've got some additional questions.

Let's start with the geographic area that you

studied. You studied a ten-county area, one-hour drive. My question is, are any of those ten counties in Oregon?

A. Yes, some of them are.

Q. Did you attempt to analyze only counties in Washington?

A. That was not an analysis we did.

Q. Okay. So your analysis does not -- your overall analysis does not include Washington-state-only impacts?

A. Right. The values in the primary impacts analysis are -- reflect a combination of benefits to Oregon and to Washington.

Q. In your prefiled testimony at paragraph 13 -- and feel free to look at it if you need to, although I think my question's pretty simple -- you state that economic impacts are evaluated through comparison between a policy case in which the project is developed and a base case in which it is not; is that correct?

A. That is what it says, yeah.

Q. So your analysis assumes that either the site is empty or that the Vancouver Energy project is built; is that correct?

A. So in the primary impacts analysis, what we've assumed is that -- we just look at the benefits relative to a state in which Vancouver Energy is not there and there's no other -- nothing new is happening at -- other

than what's happening in the present day.

Q. Okay. So maybe you can clarify this for me. I read your prefiled testimony to assume that there was zero income from the project site at the moment. Is that correct?

A. So at the project site, one could assume -- so to the extent -- and this is something I don't know the answer to. To the extent Vancouver Energy coming in would change revenues to the port, that might have a change that wouldn't be accounted for.

My understanding is that the Vancouver Energy project is -- because we did ask this question, is coming in and would not currently affect any existing operations -- or any existing planned operations, such as the Potash facility that was discussed earlier.

Q. Okay. So bear with me in my layperson's understanding of what you did. So if, for example, the port was currently using the proposed Tesoro site to store large parts from wind turbines and wind turbine engines and receiving revenue from that, you would not have deducted that from your base case, right? Your base case is zero?

A. Well, I -- so I think the right question is less about specifically what's going on with it -- with the specific parcels as opposed to what the change in the

economic activity would have been had the project come in. And so they may be -- happen to be storing wind turbines in that spot, but there may be other places where they could move those wind turbines, that would mean that they can still continue to put -- serve both of those clients.

Q. But your analysis in your primary impact study assumes that there is zero income from that property and therefore any income that the port would derive from the Tesoro Savage project is credited at 100 percent, correct? You're not discounting it for any revenue that's currently being earned for that site?

A. And I just want to be clear. We're not --

Q. Well, first let's answer "yes or no" to my question.

A. Can you repeat the question? I think the question is, it depends. So I think that's why.

Q. Okay.

A. So it depends on whether or not that the Vancouver Energy coming in actually changes any current services that the port is providing. If it does not, then -- which my understanding is the case, then what we've accounted for is the fact that there's no lost revenues associated with having Vancouver Energy come in.

To the extent that there is such an effect, that's not something that would have been accounted for.

Q. But if there were such an effect, you would have subtracted that incremental effect from your 100 percent causative net impact? And correct me if I'm messing up the terminology.

A. To the extent that that economic activity goes elsewhere as a result of -- so say it's a turbine laydown. To the extent that economic activity goes elsewhere outside of the region, that would be something that we would appropriately account for -- or should -- or would want to appropriately account for. To the extent that --

MS. LARSON: Are you-all able to hear him?

JUDGE NOBLE: I can hear him.

BY MS. LARSON:

Q. Sorry.

JUDGE NOBLE: The council's not shy about speaking up. The court reporter appears to be able to hear him.

MR. DERR: This is where we coach the witness, that you can be rude and look at the council even when you're crossed.

BY MS. LARSON:

Q. All right. Proceed.

JUDGE NOBLE: We want to get the answer to this question, but I'm looking at the clock.

MS. LARSON: Excuse me?

JUDGE NOBLE: Probably would have been a good place to break before you got involved in your cross-examination. I do apologize for that. We're almost at 12:00, but the witness hasn't answered this question yet. So let's get that at least before lunch.

A. So I think I've answered it, which is to say that to the extent that there is -- the real question is Vancouver Energy comes, does it have an adverse impact on existing business within the ten-study area? And my understanding is, not in any meaningful way. My understanding is that these are kind of underutilized parcels at the port and to the extent there are activities going on there, that they can be shifted. And so my understanding is that this is not a meaningful effect.

But to the extent that, say, there was -- you know, Vancouver Energy was coming, it was kicking out some business that then went off up to Tacoma, that would be something that would be appropriate to account for. But that is not accounted for in the work I've done.

JUDGE NOBLE: Is this a place where it's

okay to -- from your point of view, to break, or do you -- I assume you have several more questions?

MS. LARSON: I do have several more questions.

JUDGE NOBLE: All right. Then I apologize for interrupting your cross-examination, but this is noontime and we need to break for the sake of everyone. We'll be in recess for one hour until 1:00.

(Recess taken from 11:59 a.m. to 1:02 p.m.)

JUDGE NOBLE: We're back on the record. Mr. Schatzki, welcome back.

THE WITNESS: Thank you.

JUDGE NOBLE: Mr. Derr, please proceed.

MR. DERR: I think we were doing cross, as I recall. We were doing cross, as I recall, so I'll defer.

JUDGE NOBLE: We were.

BY MS. LARSON:

Q. All right. Mr. Schatzki, before the break, we were talking about your primary economic impact analysis, Exhibit 156, and I have a couple more questions about that. In paragraph 14 of your prefiled testimony, get to that, you point out that you did not consider alternative uses of the site; is that correct?

A. That's correct, we did not perform any

quantitative analysis of alternative uses of the site.

Q. All right. So your analysis in Exhibit 156 basically assumes that the site will either be empty or that the Vancouver Energy project will be built; those are the two options?

A. That's more or less correct.

Q. All right. Then turning to paragraph 18 of your prefiled testimony, you state that the information on the project's construction and operations in the primary impacts analysis were provided to you by Tesoro Savage; is that correct?

A. That is for the most part correct. In some cases, we used wages that were the -- based on data from one of the Washington State Department of Employment Agency, or something to that effect.

Q. All right. But your assumptions on employment, construction costs and annual operation costs, schedules for the timing of construction and schedules for plant operations, including assumptions about throughput levels over time, were based on information provided to you by Tesoro Savage; is that correct?

A. That is correct.

Q. Was that information as of July 2014?

A. That information was as of the date of the Primary Impacts Report.

Q. I believe that's July 2014. My real question is, did you update any of your analysis based on applicant's revised application that it submitted in May 2016?

A. No, we have not done the updates of them.

Q. Okay. So the inputs in your IMPLAN model analysis on those topics were based on information from the applicant as of July 2014?

A. Yeah. I mean, I will say over time, we -- I have -- we have -- as the process has gone on, we have at points in time asked, oh, you know, when -- including certain things in reports and such, asked, have these assumptions changed, and we have never been given the answer to that, yes, these assumptions have changed. We should revise the analysis accordingly. So nothing like -- you know, so my understanding is more or less, particularly in terms of the employment numbers, those have all stayed the same.

Q. Thank you. Okay. So now I would like to turn to Exhibit 158, which is your statistical analysis of property values. Did you visit the neighborhoods along the rail line before you prepared that analysis?

A. So as part of the -- yeah, so back a couple of years ago when we first started getting involved in this work, we spent a day in Vancouver driving around places

like the port. We actually drove down the -- down the rail line and through -- I know there are a number of bridges. We went down under kind of underpasses in some of these small neighborhoods. So we -- so, yes, I have driven through some of these neighborhoods.

Q. Okay. But the only studies that you looked at were from Cleveland and Los Angeles; is that correct?

A. The only studies that provided information on the kind of incremental impact of increased rail traffic were from Cleveland and Los Angeles, yes.

Q. And those were the only two studies that you looked at, correct?

A. Those are the only two I'm aware of that exist.

Q. So would you agree with me that people will pay a premium for a view of something like the Columbia River?

A. That seems like a reasonable expectation.

Q. Okay. So in your statistical analysis, did you attempt to account for that? Because we're in a situation where many of the homes along the rail line are either on the waterfront or have a view of the Columbia River.

A. Yeah. It's a great question and it certainly crossed our mind. So one of the things we did, if one looks at the results, one actually gets some

counterintuitive results, at least compared to all the literature, where some of the properties "nearby," at least to the distances we looked at to the rail line, are, in fact, somewhat higher valued than otherwise comparable properties elsewhere. One might ask, well, why is that the case? And it could be you're nearby to the Columbia River; that's a very -- that's a nice amenity to live by, maybe that offsets or more than offsets the amenity or the disamenity, to the extent there is any, of being near a rail line. You may actually also be near to the freeways. There may be many other factors. So that certainly crossed our mind in the analysis.

I think the question is whether or not the timing in our analysis when you look at the change in value over time, that there's no reason to think that the value people place on having a nice view of the river has changed meaningfully over the last ten years that we looked at data, or has changed before and after, given the information about the facility. So there's nothing to suggest that that timing of people suddenly valuing, you know, seeing the river has changed meaningfully over time or any timing was coincident with the announcement of the project.

Q. So you basically treated it as a neutral value

and didn't -- because it was constant over time?

A. Yes. It's embedded in those distant -- those variables that reflect the distance to the rail to the extent they're proximate. Now, we also did some analysis, because there's a -- part of the rail goes north of the city towards Seattle. That is not right on the -- on the Columbia the way the southern rail is. We did some runs where we kind of separately looked at that southern rail versus the northern rail, and it didn't meaningfully change our results at all. So that's another way we tried to control for that amenity effect.

Q. That northern rail, my understanding is, is not proposed to be the primary method of bringing the crude by rail into the Tesoro facility; in fact, the Tesoro facility rail line ends at the western terminus -- or the western edge of the property, correct? So wouldn't it be true that the rail lines going to the north either don't have crude-by-rail or are empty?

A. Well, just so we're -- so my understanding is the -- is that the crude-by-rail will be brought here along BNSF rail lines by BNSF trains and they are then brought into the port. So you kind of mentioned there was Tesoro Savage property there, so I just wanted to clarify.

My understanding is that the routes of the crude

to the rail would come along the southerly route. That was another reason for trying to look separately at the southerly route versus the northerly route, just to be sure if we really concentrated our focus on the line where we thought there would be greater impacts, if we would see something that you might not see because you're looking at both lines and you're kind of diluting the effect to the extent there is one. So that was part of the rationale for us actually looking separately at that southern portion of the line.

Q. So did you include areas along the rail line where there would be empty crude-by-rail trains passing?

A. Can you repeat the question?

Q. Does your study area include properties along a rail line where there would not be full crude-by-rail tanks going by but only empty crude-by-rail cars going by?

A. So we don't know which -- exactly where the crude-by-rail trains are going to go. I don't think that's something we know ahead of time. As I said, we did an analysis where we looked separately at the two segments; those that extend, you know, to the east of the port and those that extend to the north, just to see if there was any differential effect, to see if there was some positive effect after the announcement that

maybe happened north of the city but not -- but not south. I mean, we were kind of being agnostic when we looked at the data about what we were looking for. We were just trying to disentangle the various effects such as we did expect different levels of traffic along one line -- one of those lines versus another.

And so, you know, again, we didn't -- you know, we tried to identify both of those effects, given that there is an expectation along the southerly line, that there will be more crude-by-rail trains than there will be along the northerly lines, or at least they would be loaded along that line. And again, we didn't see any effect there.

Q. Would you agree that there would be a difference in the perception of risk on those areas along the rail line where empty trains are passing as opposed to those areas where loaded trains with crude oil are passing?

A. I guess I will take my kind of social scientist perspective and say -- I would say differences in perspective of risk. I would want to survey and identify and let people -- and let -- and, you know, do a survey and identify if, in fact, people perceive those risks differently. I don't want to presume what people in general within the Vancouver area kind of --

Q. So you don't know if there would be a difference

in risk? Is that your testimony?

A. I don't know if there would be a difference in people's perceptions of risks of those two things.

MS. LARSON: Let's turn to Exhibit 155. Can we get Table 13?

BY MS. LARSON:

Q. Table 13 shows estimated real market value and annual tax impact based on three different studies; is that correct?

A. That's correct.

Q. And as part of that table, you looked at estimates based on a 2011 study entitled "Examining the Spatial Distribution of Externalities of Freight Rail Traffic and Home Values in Los Angeles," correct?

A. That's correct.

Q. And based on that study, you calculated up to a $66 million negative impact on property values within Clark County associated with increased rail traffic associated with this project, correct?

A. So just to clarify, what I did was I took values that had been put in -- developed by Mr. Johnson about the real magnitude of the properties that are within one mile. So I --

Q. That's actually not my question. I asked you if you ended up with a value of $66 million for real market

value based on that study, impact in Clark County. And I would refer you to paragraph 66 of your direct testimony.

A. Right. And there I identify that, based upon estimates of real market value that were developed by Mr. Johnson, I -- and based upon the --

Q. Again, I just asked you, did you arrive at a $66 million figure, yes or no?

A. That $66 million figure is there in my testimony, yes.

Q. All right. Do you consider that $66 million impact on Clark County property values to be insignificant?

A. Yeah, I would say in the context of the total market value of property values within the Vancouver area, I would say in the context of fluctuations in property values over time, I would say in the context of other changes in property values that would be happening as a consequence of the Vancouver Energy policy, I would say that those are not significant changes in property values.

Q. Okay. So time variant effects, such as years and months, do account for the seasonality of sales, and I believe that you looked at a number of different time periods to try to account for that; is that correct?

A. I'm sorry, can you repeat that?

Q. Time variant effects, such as looking at different periods of time and different seasons, can account for fluctuations in the hotness of the real estate market; is that correct?

A. There can be cycles in economic markets.

Q. Okay. Would you agree with me that it is fair to say that the Portland-Vancouver area has been one of the hottest real estate markets in the country over the last couple of years?

A. I'm not in a position to make an opinion on that.

Q. Okay. Did you consider using a housing index variable, such as the Case-Shiller Index for Portland, or the monthly medium house sales for Vancouver as a trend over time as a way to account for the hotness of the real estate market?

A. So I actually in my testimony did include the Case-Shiller Index and the changes in it. I don't honestly, as I sit here, remember if it's in my prefiled testimony or other reports, but that is actually an index I used to show the variation that has occurred over time in the -- in property markets here recently in the -- and try to put it into context what a one -- something in the ballpark of a 1 percent change in

property values, what that kind of means.

Q. I would like to turn now to the secondary impact study, Exhibit 157, and specifically to paragraph 37 of your prefiled testimony -- prefiled testimony. And in paragraph 37, you state that based on comments provided by BNSF, there is not anticipated to be any meaningful change in rail traffic as a consequence of the Vancouver Energy project; is that correct?

A. Let me just get to the testimony. I opened up to the secondary --

Q. It was paragraph 37.

A. Paragraph 37. That's correct. That's in my testimony.

Q. Did you attempt to independently verify that there would not be any meaningful change in rail traffic as a consequence of the project?

A. No, I did not.

Q. All right. In paragraph 69 of your testimony, you predict that business impacts are relatively limited due to delays at rail crossings; is that correct?

A. That's correct.

Q. Did you consider impacts on personal households due to delays at rail crossings?

A. To -- as opposed to impacts on businesses?

Q. Yes.

A. I honestly would have to go back and look at -- I believe in my testimony there's analysis that includes both delays to household people and delays to businesses, and that both those numbers are in there. But that's subject to confirmation.

Q. All right. Let's go back again to Exhibit 155 and pages 10 and 11, Tables 11 and 12. Actually, what I want is Table 12. So Table 12 shows impacts of nearly $35,000 per year for a single intersection in Spokane; is that correct?

A. That is correct.

Q. All right. Are you aware of how many at-grade rail crossings there are on the rail lines that are likely to be used on that BNSF mainline between Spokane and the Port of Vancouver?

A. No, I'm not.

Q. Did you -- so you did not attempt to calculate the statewide impacts at at-grade crossings along the BNSF mainline?

A. We did not. We looked at several indicative locations, Vancouver area, Spokane and Bingen.

Q. Okay. And Table 12 shows over $90,000 per year in estimated impacts from rail crossing delays from just those select number of crossings in the Spokane area; isn't that right?

A. That's correct. And as I'm looking at this, I'm also kind of realizing that one thing that I think is important to mention is that these are outside of the study area. So I'll just add that as a caveat.

Q. Right. So you don't -- your analysis was limited to the ten-county study area, correct? You already testified to that.

A. The direct -- the direct impact analysis is limited to the ten-county study area, yes.

Q. The secondary impact analysis is also limited to the ten-county area?

A. So the secondary impact analysis, I would say, focuses on the ten-county area, but also provides some information that extends beyond it, such as these areas that are outside of it.

Q. So what is the estimated economic benefit from the Tesoro project to Spokane County?

A. That I don't have an answer to. We have not analyzed that.

MS. LARSON: No further questions. But Mr. Kernutt has some.

JUDGE NOBLE: Is there further cross-examination of this witness?

MR. KERNUTT: Yes, Your Honor.

JUDGE NOBLE: Mr. Kernutt?

CROSS-EXAMINATION

BY MR. KERNUTT:

Q. Good afternoon, Mr. Schatzki.

A. Good afternoon.

Q. My name is Matt Kernutt. I am the statutory Counsel for the Environment. I just have a few questions for you.

I'm particularly interested in the portion of your prefiled direct testimony regarding secondary impacts from an accident or spill. That is for you -- it's paragraphs 81 through 85 in your prefiled direct testimony --

A. Yeah.

Q. -- for your future reference. In your prefiled direct testimony, let's start sort of towards the end in paragraph 85. As I understood that testimony, is it accurate to state that your testimony is that a major oil spill could create economic benefits?

A. Are you asking on net, or to some degree are there economic benefits --

Q. Any economic benefits.

A. What?

Q. Any economic benefits.

A. So when an oil spill happens, there's a lot of economic activity that's associated with it, some of

which is associated with the remediation. That creates jobs and creates economic activity. So that is -- if you want to characterize that as benefits, then those would be economic benefits.

Q. Is it your testimony that there would be net economic benefits?

A. It is not my testimony that there would be net economic benefits.

Q. Let's turn to paragraphs -- focus the beginning of section C, on 81, 82, 84. As I understand your testimony, particularly in paragraph 82, you opine that recreational and commercial fishermen could potentially shift the location or the timing of their fishing in order to mitigate impacts associated with a fishing closure. Is that accurate?

A. Yes, that's accurate.

Q. For the purposes of your testimony, did you evaluate the behavior of commercial or recreational fishermen as a result of prior oil spills across the United States?

A. I would say my comments are more in the spirit of what typically economic analyses I have valued and I don't, as I sit here, recall if they were specific to oil spills or other things, but these are just analyses done in the context of the environmental economics

literature in which it's a fairly standard practice to -- when thinking about the impacts associated with a particular limitation on fishing, restriction, other things, to think about substitutions, and that commonly happens in the case of recreational fishermen who may -- you know, when restricted to a given use, may shift to another use that is likely less desirable but yet compensates somewhat for the complete loss of that --

Q. So I apologize for interrupting. Is the answer "yes" or "no" to the question?

A. So can you repeat the question?

Q. Did you evaluate the behavior of recreational and commercial fishermen as related to previous oil spills across the United States that resulted in fishery closures?

A. So that specific -- I did not do research specifically on that --

Q. So the answer is no?

A. -- as part of this -- as a part of this work.

Q. As a part of this work, did you evaluate the lengths of specific fishing seasons on the Columbia River?

A. I did not look at the specific lengths of the fishing seasons.

Q. Did you evaluate the geographic scope of

specific fisheries, both economic and recreational, on the Columbia River?

A. Part of what I did was to look at just some background information on the different commercial and recreational fisheries in the area, but it wasn't, I would say, an in-depth research, no.

Q. Okay. Did you evaluate anything regarding Columbia River treaty fishing management as a part of your testimony?

A. Not with respect -- well, I think that issue came up in some of the readings I did, but that was not a specific focus of my research.

MR. KERNUTT: Thank you. I have no further questions.

JUDGE NOBLE: Could I just ask the witness to clarify that last answer. You said it wasn't a specific focus. Was it a focus at all?

THE WITNESS: To clarify, I did not go out and say I need to study the Columbia treaties that you -- that the counsel referred to, but in some readings I did, that issue came up and was part of what I read. I'm not sure if that's responsive.

JUDGE NOBLE: I'm sorry, I thought the question was with regard to treaty fishing access, not the treaties themselves. So that's what I was asking.

Did you study that at all?

THE WITNESS: In either case, whether it was the treaties themselves or the access that was afforded under them, it wasn't a specific thing I went out and did thorough research on, but those issues came up in things I read.

JUDGE NOBLE: Did you consider those issues at all?

THE WITNESS: Did I consider those issues?

JUDGE NOBLE: In your conclusions.

THE WITNESS: I would not say those issues, per se, affected my conclusions.

JUDGE NOBLE: Thank you.

Is there further cross-examination of this witness?

MS. REED: Yes, Your Honor.

CROSS-EXAMINATION

BY MS. REED:

Q. Good afternoon. My name is Karen Reed. I represent the City of Vancouver. And I just have a couple of questions for you following up on the questions that were just asked regarding fisheries' impacts. I noticed in your testimony that you referred to fishermen, and you do not distinguish between -- at least in your written testimony, between recreational

and commercial fishing versus tribal and subsistence fishing. Is that accurate?

A. Yes, I do not distinguish between those -- between those things.

Q. Okay.

A. Or should I say, I did not carve out a third category for tribal fishing, which I would -- from my perspective would be somewhat of a third category, different than -- different than commercial but very akin to commercial but -- and different from recreational. But that's all confessed upon limited -- this is not my area of expertise, to be clear.

Q. Okay. Thank you. And I wanted to ask you a question about your property value analysis. Is it fair to say that an underlying assumption of your property value analysis is that people in making their economic choices about property will respond in the same or a similar manner to the announcement of a project in the future and to the actual implementation of that project or the existence of that project?

A. So I wouldn't expect that the announcement -- the announcement creates a potentiality that the implementation comes. And so there's some likelihood that if I 'm a homeowner and I'm going, I really don't want to live by the rails when these train -- more

trains are coming down, you kind of know there's some likelihood it'll happen, there's some likelihood it wouldn't. So I wouldn't expect the same full effect that one would find after it has been implemented, if that's --

Q. With respect to your opinion on the property value changes that might or might not occur following implementation of the project, aren't you relying on statistical studies regarding the effects of preimplementation? I thought I heard you testify that you were looking at studies that talked about whether there were changes in values when projects were announced or made known publicly.

A. So there's clearly -- to the extent there's a response in the market, it would be a rise in our study because there's an expectation that this event is going to happen and it has an adverse consequence. Now, based upon experience in markets, information when it becomes known to the market quickly gets translated into property values or asset values. This is something that is well established. In fact, once that information is there, even if the actual implementation is down the road, you know today that that property you have is less valuable.

The thing that you also -- that's also different

here is there's some likelihood it's not going to happen, and that's something where I would expect to diminish the magnitude of the effect but not necessarily eliminate it.

Q. So your testimony is that you assumed that there was a correlation; in other words, the behavior was similar, but not that it was identical?

A. I guess I would -- another way to frame it is to say that to the extent there was an effect, I would expect it to be a smaller effect than would eventually occur when the facility was developed.

Q. And did you look at any studies or statistical analyses to support that conclusion?

A. So I'm not quite sure I understand. To support which conclusion?

Q. So I believe you just testified that you believe that the reaction of the market to an announcement of a potential project would have a similar effect as its implementation but probably to a lesser magnitude. In other words, if a project were announced and that had a detrimental effect on property values, the announcement of that project might suppress property values some and the actual implementation might suppress it some, plus a little more.

A. Yeah, so we see this kind of reaction by the

markets every day. We see it in the stock market. When information becomes known about something might happen. So look at the Brexit vote that happened. The markets assumed that that vote was going to be -- that Europe -- the EU was going to stay and consequently was one level. When it changed the next day and the vote happened, things moved very much. So markets make -- build in expectations about risks -- "risks" about things happening all the time. That's a very common finding within the economic literature.

Q. So did you look at any literature involving specifically real estate with respect to that issue, rather than stock markets or other types of markets?

A. I would have to look back at the literature I've looked at to the extent that this effect has been identified in some of these other studies I've looked at.

Q. Would you agree that commercial property owners or prospective property owners typically have a different access to information about the market or a different level of sophistication about the market than residential purchasers or prospective purchasers?

A. So I -- so I would agree that -- well, in general a commercial -- when you say "commercial," do you mean the actual people that own commercial property?

Q. Yes. So let me make my question a little more concrete. If you were going to buy an office building, I assume you would do some degree of due diligence that would involve checking what projects were planned in the area. And would you agree that it would probably be a lesser level of due diligence or perhaps none at all if a consumer were buying a house instead of an office building?

A. I'm not sure I would agree with that. I think -- I know I've bought two houses in my life and in both cases I really looked carefully at those regions. I looked at the schools. I looked at what was nearby. I tried to understand what was happening in the neighborhood. So I thought a lot about it because it was a very infrequent purchase. Whereas commercial property owners may be making lots of purchases and it may be their business, they may have more time, but they may be doing it more frequently. I'm not quite sure -- I don't necessarily agree with your premise, I guess.

Q. Okay. What about access to information? Would you agree that commercial property owners or prospective property owners typically have access to better information or have more readily available information about properties than residential purchasers?

A. So potentially, commercial business owners have

access to information -- certain types of information -- I think all the information everyone has equal access to. The question is how much time and effort do they have to put into getting the information and to keeping it. And commercial businesses, real estate companies have lots of people down at the planning offices, they know exactly what's going on. If you're a household, you probably don't do that.

So I think the real question is the extent to which information about the project here was known to people in the community, and I think that's one thing that was -- went into our study, was thinking about there's been 24 months and the question is how much public interest has there been in this. If there's been a lot, then my guess is most people in the community know about it. They're talking about it. It's in the front pages. And so I think you become aware of it in that respect.

Q. Okay.

MS. REED: Thank you. No further questions.

JUDGE NOBLE: Is there any further cross-examination of Mr. Schatzki?

Redirect?

MR. DERR: Thank you, Your Honor. I think I have just one.

REDIRECT EXAMINATION

BY MR. DERR:

Q. I'm going to take you back to paragraph 66 of your prefiled testimony. While you're looking at that, maybe I'll phrase it. This was the paragraph where you were asked to admit that the word 66 million is contained in that sentence.

A. Paragraph 66?

Q. Yes, paragraph 66.

A. Yes.

Q. Can you just tell me whether that paragraph is referring to -- let's just read the first two sentences of that paragraph for me, please.

A. "Table 11 also provides corresponding estimates of real market value and annual tax impacts. Potential impacts range from $0.0" -- "$0.0 to $66 million for real market value, and $0.0 to $0.8 million for annual tax impacts based on Futch and Simons and El Jaouhari."

Q. So does that reflect your opinion as a range of potential impacts or 66 million of potential impacts?

A. So it reflects -- well, just to be clear. It reflects two things. All of these are based upon estimates of the real market value within one mile of the rail line that were developed by Mr. Johnson. And that's information I haven't had an opportunity to

review. So we're taking that real market value as given.

Other than that, what it's presuming is that that impact is a range. It could be as low as zero, could be as high as 66 million.

MR. DERR: Thank you. No further questions.

JUDGE NOBLE: Council questions. Mr. Lynch?

MR. LYNCH: Good afternoon. I was looking at your prefiled testimony at page 6, and I'm looking at both paragraphs 15 and 16. You were talking about the IMPLAN analysis and that it reflects the direct impacts of the new economic activity from the project's construction and operation, and that this particular model that you use -- or software is widely used for economic impact assessments in the public and private sectors.

So I see that you used that for direct impacts. But the report that you -- in your report on page 6, this would be Exhibit 156, of primary economic impacts, you also discuss that there are -- besides the direct impacts, there are indirect impacts and induced impacts. And you refer to these as what people often think of as multiplier effects. So you're saying in terms of the economic benefits you've shown from this proposed project, from the tables, you are not including

any multiplier effects; is that correct?

THE WITNESS: No. Actually the multiplier effects really refer to these indirect and induced effects, and those are part of the 1.2 -- the 2 billion and the 1.2 billion that I've included earlier. Those include direct, indirect and induced effects.

MR. LYNCH: Okay. And is there any -- is there a well agreed-to model for calculating those like there is for IMPLAN?

THE WITNESS: Yeah, I just want -- so to clarify, what IMPLAN actually does is -- its main purpose is to calculate those indirect and induced effects. So IMPLAN takes information about the policy, the project you're analyzing and basically looks at -- and given the specific kinds of labor, the kinds of sectors it's going to, you know, take goods and services from, identifies how much that kind of ripples throughout the whole economy, and it's that ripple part that the IMPLAN model is really -- that's its main purpose, is to estimate those ripple effects or the multiplier effects.

MR. LYNCH: So those are included in your numbers?

THE WITNESS: Correct, yes.

MR. LYNCH: Okay. And then my last question

pertains to your -- the Exhibit 157, or Attachment D, page 27, the secondary impact analysis. And you're referring to the current utilization of the -- of the rail lines, and there's a range from 15 to 86 percent. And I know that your -- in your -- that you've referenced that it's a very dynamic process.

But I'm just wondering, when you look at this range, are you looking at the busiest time of the year for these particular rail lines, for example, like during the fall, late summer/fall, you've got a lot of agricultural products that might be moving. So I'm just kind of wondering when you say there's this range from 15 to 86 percent of utilization, what does that mean?

THE WITNESS: So what that's specifically referring to is in Washington state rail transportation plan, there was an estimate of the current traffic on those different segments, and it's specifically taking those as kind of a benchmark and then adding for. And I think it's on the prior page to the -- or maybe it's the page after Table 11 in the secondary impact report, basically is just information straight out of the Washington state rail plan, and then adding the additional four trains a day to it. And all those figures just come out of looking at that range right there. And also part of that is looking at the maximum,

you know, some estimate of what the capacity of those different lines are. So it's just looking at that -- you know, what the current use would be. I believe the estimates that I've cited include the four trains, and then relative to the capacity, that capacity figure. So I think it's a less nuanced analysis than what you're thinking of right there.

MR. LYNCH: What I was trying to think of is if you say the lines aren't used from 15 to 86 percent of the time there's a range, and I realize this wasn't your report, but there might be particular times of the year when a line isn't used 35 percent of the time but another time of the year, you know, there's a lot of agricultural production, it's just 5 percent from capacity. So I was just trying to get a sense of when you have a range like that, what it was.

THE WITNESS: And I think that range is actually a geographic range. That range was not on a given line. That is the range and capacity it could be. That was reflecting the extent to which capacity is kind of a limiting factor -- or one estimate of capacity, because I think that's a fairly static view of it. So it's really an extent to which that varies across the many lines within Washington state.

MR. LYNCH: So it's kind of a higher-level

view. Is that fair to say?

THE WITNESS: Yeah. Yeah, I think that's fair to say.

MR. LYNCH: Okay. Thank you.

JUDGE NOBLE: Mr. Stohr?

MR. STOHR: Good afternoon, Mr. Schatzki. I wanted to explore some of the assumptions behind some of the statements in your study in terms of indirect impacts and fisheries.

When you talk about the ability of the commercial fleet to find alternative fishing areas, did you take a look at the types of licenses that would be required, the gear type, the seasonality of those various alternative fisheries or the species, the value of the species being fished?

THE WITNESS: I did not look specifically at any of those factors.

MR. STOHR: How about in terms of indirect impacts, the potential economic loss due to exposure of these various stocks that are returning over the long time? There's been several studies that show that the impacts can be long term.

THE WITNESS: No, that was not part of what I looked at.

MR. STOHR: I'm also interested in

assumptions behind -- what I thought I heard you say was that the impacts to the commercial sector was -- were akin to the tribal fisheries, a few minutes ago. As you're thinking about being akin, did you look at the cultural and subsistence value to the tribes in addition to the X vessel value?

THE WITNESS: Yeah, that was not a part of it. It was just a question of sustenance and both being driven by kind of sustenance needs. That was my -- the linkage I was mentally making.

MR. STOHR: Treaty rights to fish on those stocks in their usual and accustomed areas?

THE WITNESS: No, that was not part of what I thought about.

MR. STOHR: Or -- well, I think that does it. Yeah, thank you.

JUDGE NOBLE: Any other questions of Mr. Schatzki?

Mr. Rossman?

MR. ROSSMAN: Yeah. Thank you for your testimony here today. I have several different areas of questions on -- I would like to start with the studies that you did and didn't look at in terms of possible property value impacts. And then a footnote to your testimony, so you don't consider estimates developed

through subjective opinion rather than empirical analysis. So is that studies of the nature that you were sort of also referencing in your testimony where you would want to see surveying of the populations to understand if they valued the risks differently from full and empty oil trains?

THE WITNESS: No, I think I -- so two separate things. One, when I was responding earlier to the question of risk, it really was the idea that, with respect to understanding how populations perceive risks, oftentimes our intuitions are very different than what actually people think, and I just think we want to be careful about speculating about what people think here.

This was just simply -- so you will find studies about the impacts of, say, a crude-by-rail train, a new school or something, where you have an assessor and they sit down and they say, I think it's 20 percent, I've been an assessor for 20 years, that's my professional judgment. And that's the kind of more subjective opinion approach that I was referring to in that context.

MR. ROSSMAN: So where would you place, analytically, a study that sort of asks people to put an economic value on their own amenity or disamenity value of the risk or something of that nature?

THE WITNESS: So that's a controversial topic -- and within the economics community. And in general, the recognized -- and this is pretty broadly recognized, that to the extent you can, you rely on what's called revealed preference. That is where people make their real decision in the market and they reflect their preferences in their choices that are observed.

So in this context, if we thought about what is the value of a, you know, change in rail cars to properties, it would be better to look at actual instances where we can look at that change and empirically identify how people affected -- how that affected people's decisions with respect to property purchases rather than go out and survey them. Because there are many well understood biases that are very hard to counteract, that when you ask them that question that you actually get a result that is kind of meaningful and consistent with what we observed people doing in the real world.

MR. ROSSMAN: Sure. Okay. So I think that from your testimony, I found two ways that you maybe excluded studies from what you were looking at and one was studies that just focused on proximity to the rail line rather than a change in traffic. And the other -- it's implied by this footnote, that some studies that

didn't meet your methodological framing were excluded?

THE WITNESS: There was one study that was referenced in the note you're referring to that was I think of another -- some kind of energy terminal, I forget if it was coal or crude, up in Seattle -- the Puget Sound area, that was -- and is more or less someone saying that I think the impacts are X, Y and Z. That doesn't meet my -- you know, my empirical methodological hurdle of kind of relying upon what we observe in the market.

MR. ROSSMAN: Got it. So there weren't some set of other studies that were excluded, just that one?

THE WITNESS: Other than that one, but there certainly are others out there, not so much -- I'm not aware of any other specific to, kind of, energy distribution facilities in Washington state.

MR. ROSSMAN: And there was a brief point that you made in your testimony distinguishing oil trains from nuclear waste and the risks there. And I assume that was sort of conjecture and not based on some analysis that shows the difference between the amenity risk census people have of those, as you said, our perceptions of those might differ from.

THE WITNESS: Sorry, can you ask the question again?

MR. ROSSMAN: Yeah, you had mentioned, I think, in regard to a study on property value impacts of nuclear waste movements, both that it had ambiguous results, but also that you saw that as distinct from the risks posed by oil trains and how people viewed that risk. I'm wondering if there was -- is that based on a study or is that conjecture?

THE WITNESS: No, that was -- that was an empirical study based upon using more or less the similar approaches to what we did in Vancouver Energy. The reason I didn't consider it was that it didn't strike me as comparable in terms of the nature of the valuation question and, in this context, being comparable to the -- you know, to the valuation question that was analyzed there. That is to say, it struck me as given that -- the politics that were surrounding that, the fact that nuclear waste is very -- people have very unique reactions to nuclear waste as opposed to other wastes and given the hazards involved, that this is very different than, you know, incremental crude-by-rail traffic above existing levels.

MR. ROSSMAN: Yeah, sorry if I wasn't clear, but those three factors that you just mentioned that distinguish it, those are -- that's your subjective assessment of why that study does or doesn't have --

THE WITNESS: So part of the process of taking -- I think I said earlier, this kind of a benefit transfer, valuation transfer approach, where we look at other studies in other contexts and try to bring those values there. There is a -- there is no test of what is, quote, similar or comparable. That is something we try and find the most comparable studies in using maybe professional judgment or using what seem to be, you know, other factors. You then identify that certain studies are not comparable, certain studies are.

MR. ROSSMAN: All right. Turning for a moment to the statistical analysis that you conducted. That was a really interesting approach to me, and I guess I'm wondering is that something that you've sort of seen done frequently in this type of context, where after sort of a project is announced but before it's been built, looking for a change in property values?

THE WITNESS: I've not seen that done before. And I think part of it is these are -- you know, there's a lot of effort involved in these, and so I think that's not always done.

MR. ROSSMAN: As I said, it was really interesting to me, and I guess picking up maybe on some of the City of Vancouver's questions, I wonder if we're talking about an effect that is of a size of up to one

and a half percent, once the project is built and operating, and then also given sort of the confounding variable that the rail line and the river -- the rail runs along the river and the property value impact there is maybe different than one would typically expect it to be relative to rail lines.

I guess I'm just wondering, how much weight do you place on that study as a whole; firstly, in terms of whether statistically you would be able to find a very small effect and, secondly, whether the confounding variables in the instant and the novelty of the approach -- I mean, should we see that as conclusive?

THE WITNESS: I think what it does inform is that, you know, there's obviously a lot of concern about the impacts of the rail trains, the crude-by-rail trains on property values. And the question is does this have -- do you think it's going to have a dramatic effect? As we mentioned earlier, there initially were some studies indicating a 30 percent impact on property values. And, you know, if you really thought there was going to be a 30 percent impact on property values, I sure think you would see something.

Now, if it's one and a half percent, that's harder especially since, as I said earlier, I wouldn't expect to see that full impact yet once the -- once you

know those trains are coming, it's a sure thing, that's very different than right now where, you know, the -- we're many years out, it's uncertain. So those factors aside, I think this does suggest that we're not -- I think the point of this is we did this analysis and this 24 months of the community knowing this information is out there and that this might happen, and we're not observing any change in how people value being near to or far to the rail line. And recognizing that part of it is there is confounding effects. You do have the Columbia River right there with the rail line, so people are probably torn, I love the river, but there's the rail line there. But we don't expect that to change. I'm not aware of any reason, per se, why that would have changed suddenly 24 months ago in a way that it would have offset people's dislike of the crude-by-rail trains if, in fact, that were the case.

MR. ROSSMAN: I guess what I'm getting at is, is it fair to say that that analysis is a piece that confirms your assessment that the likely impact on property values is small, in the neighborhood of 1 percent, rather than a piece of analysis that disproves that there is any effect?

THE WITNESS: Yeah, so I -- it does not eliminate the possibility that there are small effects,

such as one and a half percent or less. I don't think it precludes that kind of an outcome.

MR. ROSSMAN: Shifting gears a little bit, I'm struck by the presentation of the direct and induced impacts of the project in dollar terms and then the -- these potential negative impacts in percentage terms. And I guess I'm wondering in terms of the overall economic activity in the ten-county area, what percentage increase would the $1.2 billion over 15 years represent?

THE WITNESS: That I do not know. I have not looked at that in terms of a percentage increase for the ten-study area -- ten-county area.

MR. ROSSMAN: And then --

THE WITNESS: And I'll say part of the reason when we looked at the one and a half percent was just simply that we recognized that, you know, this was a specific disamenity associated with being proximate to, recognizing that there was going to be this offsetting effect generally of the fact that with the additional economic activity, there would be some increase -- some upward pressure on property values, but that that latter one was going to be very, very hard to measure at all precisely.

MR. ROSSMAN: I guess that's what I'm

getting at. It seems both very hard to measure and also, just given where this impact is likely to be with the ten-year overall -- or the 15-year overall economic activity in ten counties also probably a very small percentage of that total economic activity.

THE WITNESS: I don't know the answer, but it's -- I don't know if it's on the one and a half percent range, the 10 percent range or smaller. I just don't know off the top of my head.

MR. ROSSMAN: I see in your CV, and you made a couple mentions to environmental economics, that you have some degree of familiarity with -- with those kind of approaches to analyzing projects --

JUDGE NOBLE: Mr. Rossman, the court reporter is doing deep breathing.

MR. ROSSMAN: I thought I was doing better.

I guess, looking at the language of the WAC that you reference as sort of at the end of your testimony that the project has sort of analytically met those requirements, I'm wondering how you see the use of -- I wonder how you see the impact of things that are very hard to model economically, like people's concerns, like impacts on tribal cultural use of the area, like delays at crossings when you're talking about a household rather than a business. And I guess could you

speak a little bit generally as to sort of when you have a scale on which on one side you have things that it's reasonably easy and we have very good tools for modeling the economic impact of, and then on another side, socioeconomic impacts are very difficult and fuzzy to model, how do you go about integrating that into an overall understanding of socioeconomic impact?

THE WITNESS: So some of these -- many of the things you mentioned, in fact, we can subject to economic analysis. In some cases one kind of -- you know, there are many, many, many effects from any kind of project or any policy. At some point you kind of have to draw the line. And I think that's one question is, you always try to identify the major effects, quantify those as best possible and recognize that some of the smaller effects, you just -- you just can't evaluate.

There are some effects you've mentioned, such as the tribal issues, which are probably hard to quantify. And there are distributional issues that enter into any kind of project like this. And so I think one -- you know, with the standard approach that EPA does -- you know takes, is they look at both on net, how does the project look from a cost/benefit perspective; they also look at distributional

consequences. And that's kind of a separate analysis, and one needs to kind of line those up and balance those. And that's the -- that's the charge of the council, is my understanding, is to balance those, that there's probably not one number you can come out with.

But what the economic analysis can do, really, is identify for you what are the large benefits that are coming out of this, and to the extent you're kind of thinking about those other features, you know, the extent to which, you know, those -- I don't want to say you value them, but that's one way to kind of line those things up in a way that you can kind of try and make those judgments.

MR. ROSSMAN: Thank you. On a slightly different item, turning to IMPLAN for a second, Washington state, I think, is perhaps the only state that has its own input/output model produced by state government. I'm wondering if you're aware of that and, if so, if you had a chance to look at it?

THE WITNESS: I was not. You're saying it's basically -- yeah, I was not.

MR. ROSSMAN: Okay. I think it's a limited use here in that it's just a statewide model, but as we have somewhat different industry mixes and somewhat different data, I was just interested.

Let me see. Let me take a quick look. I think that's most of what I wanted to ask you about. One last thing, just to clarify. So the potential loss of property value, just perhaps the most easily quantifiable negative impact, just thinking of how to relate that to the values -- the positive impacts -- I'm struggling a little because we have on the one hand a change in capital asset value and on the other hand a change in a flow value. Do you have any thoughts on how analytically I should relate those two things?

THE WITNESS: Yeah. And just to be clear, these different values we're looking at sometimes are a little bit -- they're not quite all cost and benefits in a uniform way that you would kind of net them all out. Property value impacts, from my standpoint, are kind of a one-time thing. The asset -- once that impact comes along, once the world has changed, then that's a one-time impact to the property values. It has changed in value, the same way as if you were living at your home and suddenly the next-door neighbor, you know, tore down their house and put in, you know, a gas station. You know, your house at that point diminishes in value and it really reflects all the future value of the house.

The same way if you were going to rent the

property, that would affect the rents you could charge. And the only value from a rental standpoint is -- the property value for commercial property is just a function of the rents you can charge for them. There's no other value associated with it. So I just see that as a kind of a one-time thing.

But, you know, by contrast the -- and one thing to recognize is to the extent that -- you know, you even have that one impact, and we even talked about this, but the extent that impact is -- is indefinite, so in other words, say the project was only going for ten years and you realize, okay, the trains will be going by for ten years, my property is worth one and a half percent less, say, that impact may go away in ten years. So you may kind of get a benefit then, once it stops, that would offset. We haven't gone into that kind of details. And these all feel to me like we're kind of getting into second and third order of things and, again, we need to kind of identify what are the key impacts and kind of draw the line there.

MR. ROSSMAN: My last question, I think, is on the issue of the sourcing of the construction jobs. And I'm wondering if either initially or in response to a concern, you had a chance to get information from the project proponents about what proportion of construction

jobs they thought they would be sourcing from that ten-county area?

THE WITNESS: We have not had conversations about that. I think we just -- we have assumed that all the construction jobs would come from the ten-county area. My guess is that, given the nature of, you know, people wanting to commute more than an hour to work every day, then possibly you might get some, but that most people will be within that ten-county area.

MR. ROSSMAN: I guess what I'm wondering about, and I haven't thought to ask about this, given that a lot of the construction is highly specialized technical construction, or at least it appears that way to me, might that suggest sort of specialized firms from other regions, and, if so, how would that affect the analysis?

THE WITNESS: Yeah, that's a possibility. That's not something we've analyzed in much detail.

MR. ROSSMAN: Thanks.

JUDGE NOBLE: Mr. Snodgrass?

MR. SNODGRASS: Thank you. And thank you for your testimony in answering our questions. I have a few. Just wanted to -- I think you were pretty clear -- the record was pretty clear earlier about what was in and what was out in terms of the study and in terms of

the alternative analysis not being part of it.

I wonder if you can confirm for me, it looks like that government revenue is part of the positive part of the equation in your analysis?

THE WITNESS: That's correct.

MR. SNODGRASS: Is government cost to serve the facility and the additional workers at all included in the numerical analysis?

THE WITNESS: So to the extent that economic activity -- so the extent that there's economic activity associated with kind of serving the facility, so maybe it means there's more public utility, I don't know, more -- I'm trying to think -- land use people needing to come and manage the site, that actually would be part of the economic analysis, but that would be looked at in terms of a benefit in terms of additional jobs.

MR. SNODGRASS: Well, this would -- I guess I'm not talking about so much job creation on the government side. I'm talking about -- and I don't know this in depth what the needs would be, but certainly additional fire personnel, additional fire equipment and then in terms of the new workers both direct and then induced in the area that would -- they would need schools, they would need services, they drive on roads, that kind of thing; was any of that part of -- that

didn't look like it was part of the analysis?

THE WITNESS: No, it's not part of it.

MR. SNODGRASS: Okay. The issue of the costs of a major incident, a major spill, fire and so on, I think as I understood properly, you had made the distinction in the morning between risk and occurrence. And so nonetheless, the benefits of the project that you're discussing are over, I believe, a 16-year term or lease?

THE WITNESS: That's what we assumed in our analysis.

MR. SNODGRASS: So shouldn't we -- what I did see in the Johnson analysis, an attempt to do this, shouldn't there be an attempt to assign probability to the event of a major incident and then a cost and that be part of the 16-year picture?

THE WITNESS: That is something that could be done. That's not something I've done as part of this -- as part of my work.

MR. SNODGRASS: It's not part of that. And should that -- from an economic standpoint, should that analysis look at not just cleanup costs but, you know, business disruption costs and so forth?

THE WITNESS: Yes. That cost would -- and I think, as we discussed earlier, ABT has done a study --

ABT Associates has done a study of kind of major --

MR. SNODGRASS: And I understand you had some critiques over the number. Is the number you put forward, did that include any costs assigned to the fishing lost?

THE WITNESS: Yeah, I just want to be clear. I have not critiqued the ABT study at all. The comments I've made with respect to, you know, properly -- you know, thinking about the economic impacts of an incident really were in response to things that were in the DEIS and just trying to point out some additional things that they had not considered.

MR. SNODGRASS: Okay. But again, in terms of the numbers that you're putting forth, do those include a fisheries number, a loss of fisheries essentially in the event of an incident?

THE WITNESS: So I didn't put forward any numbers in terms of accident impacts or risks. That's not something that's part of my -- part of the work I've done at all.

MR. SNODGRASS: If there are -- whatever they are and whatever the accurate number are, and certainly reasonable people can disagree, but if there are negative amenities that have a value, shouldn't the multiplier be assessed to those as well, maybe not quite

the same multiplier but the same idea that the negative impacts have -- they ripple through the economy?

THE WITNESS: So it would depend upon the nature of the impacts, so some of those impacts. You would want to look at the, you know, other economic consequences to the extent one needs to again think about here in this case. In this case, the thing that's unique about Vancouver Energy as opposed to those accidents, is that what's really driving the economic value here is that you have new economic activity and new money that's coming here. So you have -- say -- I'm making up this number. Say it's $100 million a year in payments that are made to run the facility and to use its services. That's new money that wasn't here before that comes in.

The difference there is you need to kind of look at -- again, this is where the kind of follow-the-money issue comes in, is that, well, you know, to the extent you're a commercial fisherman, are you actually then basically doing nothing for a six-month or 12-month closure, and if the answer is you are, then, yes, you need to look at those consequences. But you may go out and do something else with your time, whether it be fishing elsewhere, recognizing the limitations to, you know, your equipment and your

licenses, or you may go out and perform some other work. And so you would continue to generate economic activity. That wouldn't -- that wouldn't be -- so there's a distinction there.

MR. SNODGRASS: I understand. So a job loss shouldn't be counted as a job loss if the person who views the job takes another job and -- okay.

THE WITNESS: Exactly.

MR. SNODGRASS: Is the reciprocal on the job creation accurate? In other words, if a job is created through this project, should that job be counted if that brings -- brings somebody over from another job?

THE WITNESS: Well, that's precisely what -- well, that's -- well, no, that's the -- I think that's the difference, is the idea here that we have new money coming into the economy and all the other things that are going on in the economy will continue, but we have new money coming in and that will mean maybe pulling some workers away from other places, but they'll be filled -- someone will come in and substitute from there, in their place. And so that's kind of what drives this, is that we have new money coming into the region from outside the region and that's really kind of the driver of all of this.

MR. SNODGRASS: In terms of the Georgia

study, that sounded very interesting. I believe it -- did you mention it was the only -- the Georgia study on the spent nuclear waste.

THE WITNESS: South Carolina.

MR. SNODGRASS: South Carolina. Excuse me. That the -- I believe it was mentioned that is the only transport of crude that was -- or study of a transport of crude on local property values --

(Simultaneous discussion interrupted by reporter.)

MR. SNODGRASS: Hazardous materials, if I heard correctly, that study was the only one that you were aware of where it made an effort to look at property values in a proximity of a rail corridor transporting hazardous materials?

THE WITNESS: That's correct.

MR. SNODGRASS: Okay. And you indicated -- I think you had said that some of the areas that was -- in Charleston, the property values have gone down and the other two towns nearby the reverse; is that right?

THE WITNESS: In one of them, there was no effect and one of them actually counterintuitively went down.

MR. SNODGRASS: Okay. What was the net -- in percentage terms, the net effect across the study

area there?

THE WITNESS: I don't know. The study authors didn't analyze that.

MR. SNODGRASS: Okay. Did -- was there -- to your knowledge, was there any evidence that -- this may be out of your expertise, but I know you've read the study, it was quoted. Was there any evidence that the -- that nuclear waste had spilled before, or there was any reasonable fear somebody might have that nuclear waste would be spilled?

THE WITNESS: There was -- well, part of the study included a survey of people in the region about their perceptions about the likelihood of accidents. Those were quite high, like the 50 percent likelihood that an accident would happen.

MR. SNODGRASS: Okay.

THE WITNESS: But, no, there was no -- there had been no -- you know, the history of nuclear power is actually pretty safe, but, nonetheless, we fear it quite a bit and that's kind of one of the factors that was driving things here.

MR. SNODGRASS: Okay. Was the -- getting back to the sort of issue that was talked a fair amount on the cross about the difference between -- and more recently your response to a question on how it's a

proposal versus an actual project approval. I think you had just said now it's a very different thing, and that's -- certainly that jibes with my experience as a land use planner, you know, often you will be hearing of a controversial project, people are aware of it, they may not like it or so on, but they don't -- the full -- you often don't hear and see the full impact until after it's built. And so if that is the case, we don't have that data yet, correct?

THE WITNESS: So assuming your predicate is the case, that that would be true. I guess I just go back to, you know, were -- you know, this is something that people in the community are aware of. I understand it's in the news and there's information and so, you know, this is something where people will be making their decisions about where to -- where to buy houses and where not to buy houses. And so I would expect it to be -- to the extent it matters to people, I would expect to see it reflected in their decisions about where to live.

MR. SNODGRASS: Okay. And in terms of the timing of the time series study, certainly the date of the project announcement would be one where you might expect to see some difference. Just looking at the time line, I think you looked at 24 months you said. The

public perception of impacts may have changed quite a bit during that process.

THE WITNESS: Yes.

MR. SNODGRASS: Okay. And so if that's the case, then some of the data after the point of hearing about the project and saying the first -- the Quebec example, and then further -- according to the record, further incidents that have occurred that may have given some people the idea that there may be a potential for a repeat event, that this isn't something that just happened once. And now most recently with the Mosier, that it had happened here locally. Would you expect, as an economist, to see some different perceptions of that risk?

THE WITNESS: I can certainly imagine the perception of risk changing over time given the information you're identifying about other accidents or whether about the likely -- the people's views of the prospects of the facility actually coming into fruition. One thing we did to test for that was to look at quarter by quarter, kind of compare that difference in whether or not that premium or discount to being near the rail changed compared to what it used to be. And there was no statistically significant -- in fact, if you look in recent times, it's been positive, not statistically

significant, though. I don't necessarily see that -- to think that means people are looking forward to the project conning in or moving towards the line as a result of that. It's just to say that we're not -- we're not seeing a big negative effect in the data.

MR. SNODGRASS: And just a clarification. Sounds like the studies you looked at and the data you looked at were residential rather than commercial for -- in terms of the 1.5 percent?

THE WITNESS: Correct. Single-family residential.

MR. SNODGRASS: Thank you very much.

JUDGE NOBLE: Mr. Rossman has another question, Mr. Schatzki.

MR. ROSSMAN: I'm remembering there is something I forgot to ask you about, which is the direct operations jobs and I guess in your primary analysis paper, the very next Table 1 showing the on-site and off-site direct construction jobs, and I'm not seeing anything similar for operations. And I guess I'm wondering what the 440 off-site direct jobs would be.

THE WITNESS: I don't know the answer to that. I think part of that is that that is -- reflects Tesoro Savage -- the Vancouver Energy coming and buying services such as, you know, janitorial services and

those services requiring labor, and so that labor then being part of those jobs.

MR. ROSSMAN: Off-site janitorial services?

THE WITNESS: Correct. In other words, having a contractor coming in, whereas --

MR. ROSSMAN: Those are not indirect impacts?

THE WITNESS: Those are not indirect impacts, just to be -- just to be clear, as they're analyzed in our study. So the difference is Tesoro -- the facility comes, it has a direct impact in terms of labor and employees and services, and goods and services it buys, and that's all a direct impact.

Now, those -- that company -- say, instead of hiring the janitors and having them on site, you have -- hire a service. Well, that service, that immediate effect, that's a direct impact. What's an indirect impact is they have to buy cleaning supplies, they have to buy buffers, they have to buy lots of equipment; that's the indirect effect.

MR. ROSSMAN: Can you help me understand why -- is it something to do with how IMPLAN models construction versus operation that we have the off-site job detail for construction but not for the operation?

THE WITNESS: I think that simply has to do

with the information Vancouver Energy had available to give to us, and they had the construction jobs broken up into off-site and on-site. And so we basically -- whereas, for the operations phase, they didn't have the information that way, or at least they weren't planning on it that way.

MR. ROSSMAN: So for the operations phase, the 176 on-site is the same as we've heard from them, so I assume you got that number directly from them, but the rest of that would have come from IMPLAN's estimates based on the dollar amount of other spending?

THE WITNESS: The other off-site jobs are also from Vancouver Energy. The rest of it is modeled as kind of generic construction.

MR. ROSSMAN: I'm sorry, I was speaking of the operation jobs.

THE WITNESS: The operations, what we got from them, we got a detailed, basically, income statement where they identified the labor, the different kinds of positions and all the different services that would be -- that they would require. We then took those dollars, and say it was -- we're going to require $100,000 in janitorial services, we then looked at the economic impact of $100,000 in janitorial services.

MR. ROSSMAN: Got it. So the direct

employees sort of carries across, but services then go into the model by sector, basically --

THE WITNESS: Yeah, you had to go sector by sector with respect to the spending, because in this context we have all the detail about exactly what their cost structure is going to look like.

MR. ROSSMAN: And is that data presented as an appendix in your --

THE WITNESS: So that data is -- in our primary impacts report is -- I forget which table it is, but I think there's only three categories. For reasons of just -- you know, confidential business reasons, they didn't want to release the more granular data on, you know, specifically all the details. So we've got a much more granular data set than what you're seeing, but that is valuable, you know, business information from the standpoint of the developers. And so they were concerned about kind of putting that information out there.

MR. ROSSMAN: And so that Table 2, those dollar amounts in Table 2 are the operating amounts such that if we plug that in to IMPLAN, we get the 440 jobs in those sectors?

THE WITNESS: So can you repeat that question?

MR. ROSSMAN: So the detail that you haven't presented because of confidentiality, is that aggregated in Table 2, such that those are the dollar amounts that you input into IMPLAN to get that job estimate?

THE WITNESS: Yes.

MR. ROSSMAN: Okay. So the Johnson concern was about that -- the 40-million-or-so, 47 million in public sector spending and whether it's appropriate to have modeled job impacts of that?

THE WITNESS: I don't want to characterize the Johnson Economics concern because it wasn't particularly clear to me. I think there was some concern about on-site versus off-site and off-site being indirect. As I've said, that's not -- that is incorrect.

MR. ROSSMAN: But approximately we would expect to be able to derive 440 jobs out of that $99 million of annual spending after full build-out, if we put it into the right sectors?

THE WITNESS: So I just want to be sure. I'm kind of lining up all the different numbers here. Right. And so all of the direct benefit -- additional direct jobs would come from the activity associated with the general operating expenses -- I think it's just the general operating expenses. I would have to go check

whether or not it includes the direct activity associated with the spending by the port.

MR. ROSSMAN: Okay. Thank you. Very helpful.

JUDGE NOBLE: Mr. Siemann has a question for you.

MR. SIEMANN: Good afternoon. So I wanted to go back to real estate values near the railroad tracks, which there's been some discussion about, and the studies you used showed increased rail traffic but we don't have any studies that address increased risk from more risky cargo on the railroad tracks. So my question is, is there any way to assess the change in real estate value due to that increased perceived risk of the crude-by-rail project and the traffic?

THE WITNESS: So the best approach would be to go look at some data from some place where you have a -- some kind of change that's happened in the world in terms of the hazard that was posed or the perceived hazard that was proposed and look and see how it affected property values. There simply hasn't been a study that's looked at that particularly in the context of the, you know, perceived hazard at issue here, the crude-by-rail trains.

Absent that, I think it's -- it's a hard

thing to do. I don't have any immediate ideas on how one would do that. I think we talked earlier about you can go out and survey people. I'm not aware that anyone in the context of property values where we have really good data would go out and choose to do that instead of actually relying upon what the data shows.

Our study was an effort to make -- do what you can with the information that we have, in this context at least, that is, to kind of recognize that we -- you know, that there's the potentiality of this facility coming, it's been there for 24 months and we can look and see what's happened. And so that was -- you know, our -- the reason to do our study was exactly -- given the question you raised, which is, well, you know, it would be good to understand what would go on specifically with this kind of, you know, potential change in activity. So, you know, that was the purpose of our study. Other than that, I would have to think about -- you would have to go and perform a study elsewhere under similar conditions.

MR. SIEMANN: Given what you understand of our task, which is in some ways to balance the economic benefits and the potential costs to the public, how would you propose we assess this issue in our deliberations, given the lack of studies that allow us

to do this in an empirical way?

THE WITNESS: I guess, honestly, when I look at this and I look at all the data, I have -- all the things we have evaluated, I've also evaluated a number of studies in stationary facilities which, while very different types of hazards, are very different -- you know, have different impacts, but they range from -- you know, in value.

This doesn't seem like a reason, frankly, to not approve this project, and that's my takeaway based upon looking at the, you know, extent to which -- from the increases in traffic, we get impacts that are relatively modest, zero to 1 percent, given that we expect property values to go up as a consequence of the economic activity from the project.

And, you know, given what our study has shown, this just does not -- this seems to be something that is a worry but not something that is, you know, within the context of the economic benefits to the region, is of the magnitude of the -- of those benefits. I just don't see the -- whatever costs there are to be of the same magnitude as the benefits. And this is specifically thinking about the property valuation. I just don't -- I just don't see that as being -- I mean, remember, my understanding is we already have

crude-by-rail traffic going on the lines. We already have 28 -- so 28, 30-or-so trains going by, so people are pretty familiarized with this.

And so this is not going from kind of plunking down a new facility, a new terminal that is, you know, dramatically different and dramatically changing things. This is an incremental change. So that's -- you know, having thought a lot about it in terms of this one particular issue about the property values, that's kind of the way I look at it at least.

MR. SIEMANN: Thank you.

JUDGE NOBLE: Are there -- we are going to be breaking at 2:30, so we'll --

MR. SHAFER: One question.

JUDGE NOBLE: Any more council questions?

Mr. Shafer?

MR. SHAFER: Thank you for bearing with me on this. These have been excellent questions, I think, by our panel and maybe to a large degree this has been answered already, but I just want to explore this a little bit further. I guess in my simple thinking, it does get down to risk. Right? And so I'm curious if -- or maybe you can help clarify. To what degree does the economic model -- does that include risk? And not to oversimplify it, but I'm just trying to structure it in

my mind. I would think the economic model, if there's development or not, certainly can do that. And then you look at the types of development, commercial, retail, light industrial and heavy industrial, I would presume that it does that.

But does it go to the level -- now that you've identified a certain industry type, to the range at which the risk is associated with that? Is the model that you're using that sensitive? Let me -- maybe just to trail on that. So the 1.2 billion over 16 years -- which was the output of that product, right, from the model?

THE WITNESS: That's correct.

MR. SHAFER: -- to what degree is that -- is that that facility under normal conditions? Is that that facility with a modest safety incident? Is that that number with a facility with a catastrophic incident? And even if I could get numbers associated with at least those -- that range, no incident, a modest incident and a catastrophic incident, I think that would be helpful.

THE WITNESS: So let me just respond briefly because I know we're -- timewise. The IMPLAN model just is looking at one important part of the benefits, which it's just looking at a piece of the benefits which would

be the economic activity from the new project and the kinds of jobs it creates and the value of the income and such that. It doesn't look at the many -- so it doesn't look at the many other economic consequences. It doesn't look at the positive impacts to property values, doesn't look at the disamenity to property values of living nearby; it doesn't look at the potential risks associated with an accident. Those are all done through kind of separate analyses that you then roll up into one big, you know, kind of assessment, assuming you've kind of done that big rollup, that that's part of the scope of what you're doing.

I think as one thing I said this morning, is that the one thing -- I have not done that assessment with respect to risk and the likelihood that accidents happen and then what happens from an economic perspective if you get such an accident.

I think we did walk through a study by ABT Associates, and they estimate that a major tanker accident would result in impacts they estimate about 200 million. I haven't looked at the guts of that to opine on that one way or the other.

But if you compare that 200 million to the 2 billion nominal, 1.2 billion present value that I estimate that I think we just -- I think one does

identify that, that those impacts are relatively small compared to the essential benefits of the project.

JUDGE NOBLE: Council questions, any further? All right.

Ms. Larson and Mr. Kernutt have questions based upon council questions, I assume. Just one? Well, this is the time for the break, but if you just have one question. And I don't know if you have -- Mr. Derr, do you have further questions as well, do you think?

MR. DERR: I have maybe one --

JUDGE NOBLE: Maybe one.

MR. DERR: -- if that.

JUDGE NOBLE: So we could just, with the indulgence of our court reporter, go a little bit longer.

Ms. Larson.

RECROSS-EXAMINATION

BY MS. LARSON:

Q. So following up on Mr. Rossman's questions about compounding variables, your market analysis, your statistical analysis, assumed that someone's market choices are not constrained; isn't that right?

A. My assumption is that properties -- yeah, my assumption is properties in the Vancouver area are --

that there's an open, free real estate market.

Q. So you didn't account for the fact that there may be populations in neighborhoods within the city of Vancouver of low-income people whose ability to move, if they're concerned about the rail, is, in fact, not existent because they don't have the economic or physical ability to actually move?

A. So my study didn't look at the mobility of a given population. My study was simply looking at the price the property's transacted at and trying to explain them and the extent to which they changed as a result of the prospect of the Vancouver Energy facility coming. I didn't look at all at the ability of different people to have mobility for housing. That's a much more -- that's a very different question than I looked at.

MS. LARSON: Thank you.

JUDGE NOBLE: Mr. Kernutt, did you shake your head no about questions?

MR. KERNUTT: I have no further questions, so I did shake my head no.

MR. DERR: And I actually am going to change mine from a question to the witness to I'll just think about how to help answer a couple questions that came from council with what lies ahead. Because I spent a lot more time on this topic than I thought I was going

to spend on this topic. Obviously an important one. So I have no questions.

JUDGE NOBLE: All right. Good. We will be in recess until 2:50.

(Recess taken from 2:37 p.m. to 2:59 p.m.)

JUDGE NOBLE: We are back on the record.

Mr. Johnson?

MR. JOHNSON: Yes, Your Honor. The applicant calls Mark Rohrbach.

Mr. Rohrbach, if you could just approach the table there and remain standing to be sworn in.

JUDGE NOBLE: Mr. Rohrbach, could you raise your right hand.

(Witness sworn.)

JUDGE NOBLE: Thank you. Please be seated.

Please proceed, Mr. Johnson.

MR. JOHNSON: Thank you.

MARK ROHRBACH,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. JOHNSON:

Q. As soon as you're ready, can you please state your full name for the record and spell your name.

A. My name is Mark Rohrbach, M-a-r-k R-o-h-r-b-a-c-h.

Q. All right. Thank you.

MR. JOHNSON: And, Your Honor, I've coordinated this with opposing counsel, Exhibit No. 205, page 1 only, we will offer that into evidence at this time. There's no objection to page 1 only. And then we would withdraw page 2, and we can work with Ms. Mastro later to make sure that that page is out of the record.

JUDGE NOBLE: And that exhibit just has the two pages?

MR. JOHNSON: Yes.

JUDGE NOBLE: All right. If there's -- there being no objection, Exhibit 205 will be admitted.

BY MR. JOHNSON:

Q. Mr. Rohrbach, can you -- first of all, you provided prefiled testimony in this matter; is that correct?

A. That's correct.

Q. Okay. And attached to that prefiled testimony was your CV?

A. That's correct.

Q. And I don't want you to repeat the full description of your experience and education that's included in your CV, but can you just give a brief description of your education in terms of your degrees and a brief description of your experience as it relates

to geotechnical and ground improvement issues.

A. Sure. I earned a bachelor's and a master's degree at the University of Washington. Toward the end of my master's degree, I did some work on risk analysis and risk management. As a professional, I have been a geotechnical engineer for about 16 years, the vast majority of that time spent working on the design side of things, so trying to figure out how to build things.

JUDGE NOBLE: Mr. Rohrbach, before we get started, I can tell already that you're a fast talker, as is almost everybody else in the room. So try to keep in mind that the court reporter -- it's late in the day, the court reporter needs to get down everything you say, so do try to speak a little bit slower.

THE WITNESS: Okay.

JUDGE NOBLE: Thank you.

BY MR. JOHNSON:

Q. All right. And there's a notebook in front of you that contains a copy of your pretrial -- your prefiled testimony and some other documents that we'll be referring to. So feel free to refer to that as we move forward with your testimony.

Where are you currently employed?

A. Hayward Baker.

Q. Okay. And were you present yesterday when

Mr. Corpron provided testimony regarding the design of the facility?

A. I was present for a portion of his testimony.

Q. Okay. And were you part of the design -- or was Hayward Baker part of the design team for the Vancouver terminal?

A. Yes, Hayward Baker was, and I am the ground improvement design engineer of record.

Q. So that was your specific role with regard to this project?

A. Yes, sir.

Q. Okay. And in your capacity as the principal engineer for ground improvements, did you consider the geotechnical work performed by GRI?

A. We did.

Q. Okay. And are you aware that GRI performed a geotechnical analysis of the soils at the facility?

A. We are.

Q. Okay.

MR. JOHNSON: And for the council's information or by way of a reminder, that investigation is included at Exhibit 1, page 6453.

BY MR. JOHNSON:

Q. And are you aware that they also performed a geotechnical analysis with regard to the dock?

A. Yes.

Q. Okay.

MR. JOHNSON: And for the council's information, that exhibit is included at parties common Exhibit 01, page 6609.

BY MR. JOHNSON:

Q. And did Hayward Baker prepare any kind of report related to ground improvements specifically?

A. Yes. We did a fairly comprehensive investigation plan, laboratory testing plan, and then we developed a report which summarizes the ground improvement design and the analysis that supports that design.

Q. All right.

MR. JOHNSON: And, again, for the council's information, that report is included in the record at the parties common Exhibit No. 1, page 6695.

BY MR. JOHNSON:

Q. Let me start by asking some questions about earthquakes in general. Okay?

A. Okay.

Q. Prior to performing -- or designing ground improvements, how do you determine what size or scope of earthquake you're going to design to?

A. Well, the first step is to go to the building

code and figure out what the probability of exceedance that you're designing to is, but the main tool you use is the USGS website.

MR. JOHNSON: Could you pull up Exhibit 205, please.

BY MR. JOHNSON:

Q. And this is a pretty busy diagram, but, Mr. Rohrbach, could you just briefly explain for the council what this represents?

A. There have been a lot of discussions about "the earthquake." And one of the things I just want to make clear is there are three earthquakes that were evaluated. The big subduction zone earthquake is the one with the big bars on the right. The Portland Hills and the local things are the smaller bars on the left. And the ones in the middle are kind of things that, as an industry, we recognize are out there some place and we're not sure where they are, they're just kind of randomly distributed. So we evaluated all of these earthquakes as part of the design of the ground improvement.

Q. All right. And I draw your attention to the testimony of Dr. Joseph Wartman, and that's included I think at tab 5 of the notebook in front of you. Have you reviewed Mr. Wartman's testimony?

A. I have.

Q. All right. And I'm going to draw your attention to page 3, paragraph 6 of his testimony.

A. I don't think it's tab 5.

Q. I'm sorry. Can you just --

A. It should be -- oh, here it is, 7.

Q. All right. We're on the same page, so to speak. Okay. Again, drawing your attention to page 3, middle of the page, there's a bullet under paragraph 6 there. And Dr. Wartman refers to a 15 percent chance that a "great" Cascadia subduction earthquake, magnitude 8 or greater, will affect the region within the next 50 years. Do you see that?

A. I do.

Q. And do you agree with Dr. Wartman's finding in that regard?

A. Dr. Wartman is quoting the USGS. When you go and look at the paper, the USGS actually says, in that paper, the probability is somewhere between 6 and 14 percent, that that individual earthquake will occur in the next 50 years.

That information is somewhat outdated because the same authors in 2014 revised their recurrence interval, which drives down the probability that that earthquake is going to happen. Now, that's -- it's

interesting, but it's not hugely relevant because, from a design perspective, even though there is an 85 percent chance this won't happen, we are assuming that it will and we are designing in the expectation that all of the earthquakes shown on that plot will occur.

Q. All right. So let's talk about "all of those earthquakes." Dr. Wartman, again, he says a magnitude 8 or greater. Is that all you're concerned with when you're considering ground improvement design, the magnitude of the earthquake?

A. We are considering the magnitude and what it's going to feel like when the ground shakes. So on this plot, the magnitude is kind of the line going up. So we're looking at magnitude 9 earthquakes. We're also looking at smaller earthquakes, which are closer and those have magnitudes of about 6 and a half or 7. And we're looking at the peak ground acceleration, which is how hard does it feel like the ground moves, for both the very big magnitude 9 earthquakes and the smaller magnitude 6 and a half or 7 earthquakes.

Q. All right. And Dr. Wartman, at the next bullet on page 3, says that seismic hazard analyses indicate that the design standard peak ground acceleration is .42 Gs at this site, and that's what you should have designed to.

Can you explain whether or not you agree with that statement.

A. The USGS says that if you take all of these earthquakes and you put them in a bag and you shake them up and you pull out the biggest PGA and the biggest magnitude, that -- you can design to that. And that's what's done if you're building a single-family house or a really small like barista stand. But if you're building something more sophisticated, something bigger than like a Walmart, you do more than just that. You look at each of the individual earthquakes that's going to happen, and that's what we did.

Q. Okay. And can you just expand on that a bit in terms of what you did and -- in terms of the number of types of earthquakes you considered. And I might add, if you could, explain what GRI did and then what you may have done in response to that.

A. So GRI started out by going to the USGS website and finding out which earthquakes had the potential to occur in this area. They then did some relatively sophisticated analysis and they said, okay, the USGS says this earthquake is going to happen this many kilometers from the site, and they took that energy and attenuated it to this site, "attenuating" meaning they allowed the energy to dissipate a certain amount, and

they said, for each of the designed earthquakes, the big one, the medium one, this is the magnitude and the peak ground acceleration that we will expect to feel at this site. That was -- that was their work product and that was something I was provided.

That work was done before I became meaningfully involved with the project. So as part of my personal due diligence, I re-created that work. The earthquakes I came up with were somewhat smaller than the earthquakes that GRI came up with, not significantly. I think I came up with an 8.9 and they had a 9. So in an effort to be conservative, I selected the larger earthquakes for each of the categories, and that works out to be a magnitude 9 and a .37 for the big subduction zone earthquake, and a magnitude 7.45 for the smaller, closer earthquake.

Q. So is it fair to say -- well, again, looking at Dr. Wartman's criticism on page 3, he suggests that you did not design ground improvements to take into account an earthquake with a PGA of .42 or greater. Is that true?

A. We -- strictly speaking, that's not true. We absolutely evaluated a magnitude 7.45. We did. We also evaluated a magnitude 9.37. It's important to keep the magnitude of the earthquake and the peak ground

acceleration associated with that earthquake together.

Q. All right. Now, turning to the next page, page 4, there's a bullet -- first bullet. And Dr. Wartman says, a major seismic event could cause Tesoro Savage's systems to fail and cause catastrophic environmental impacts.

Do you agree or disagree with that statement?

A. With the way the ground is now, I agree. After we fix the ground, I disagree.

Q. Okay. So let's drill into that a bit. You mentioned "fixing the ground." Can you just describe generally what ground improvements are and what they're intended to accomplish.

A. Very simply, the idea of a ground improvement system is to fundamentally change the ground so it does what you want it to do when you change the way you're using it. It behaves the way you want it to when you put a heavy load on it, and it behaves the way you want it to when you subject it to an earthquake.

Q. And can you give some examples of specific types of ground improvements that will be used at the Vancouver terminal site?

A. In the Area 300, which is the tank farm, we're using what's called a Vibro Stone Column. In Area 400, we're using a combination of techniques, including soil

mixing, jet grouting and, again, stone columns.

In Area 400, it's important to understand that those three techniques work together to perform -- to provide one system. So you can't look at just one piece of that system and expect it -- and feel like you've got the complete answer.

Q. All right. Could you turn to page 6 of Dr. Wartman's testimony. I'm going to refer specifically to paragraph 9. And Dr. Wartman discusses the intensity of an earthquake and the Modified Mercalli Earthquake Intensity Scale. Can you explain what that is?

A. Sure. In the 1930s, it was -- it was useful to be able to look back in history and come up with some way to describe what happened in earthquakes a long time ago. That idea was one of the things that helped us identify previous coastal zone earthquakes. And it's a very crude way of talking about what the earthquake is going to feel like. It's important that you keep in mind that the -- Dr. Wartman is right. It is an 8. It's an 8 on a scale of 1 to 12, not 1 to 10. And when he talks about poorly built structures and collapse and that kind of thing, he's talking about a design standard that was modern in 1939.

You cannot build a building today the way we

built them in 1939 because the code won't allow it. We now consider things like earthquakes.

Q. All right. And did you take those considerations into account in your design of ground improvements at the Vancouver terminal site?

A. We did.

Q. On page 7, Dr. Wartman discusses soil liquefaction. Can you just give a brief description of what soil liquefaction is?

A. The technical definition -- and I'll give you an easier one in a minute. The technical definition is the rapid increase of pore water pressure resulting in a loss of soil strength. Basically, it's quicksand. That's what you saw on TV when Tarzan was running through the jungle, is quicksand.

Q. And Dr. Wartman says that the Tesoro Savage terminal site has an extremely high susceptibility to soil liquefaction. Do you agree with that?

A. In the present condition, I agree. After we fix it, that won't be true.

Q. All right. And you compared the liquefaction phenomena to quicksand. Does that mean if there is a strong enough earthquake, the soil at the surface will liquify?

A. The only -- "liquefaction" is defined as an

increase in pore water pressure, so you have to have water in order for liquefaction to happen. Liquefaction cannot happen above the ground surface -- above the groundwater surface.

Q. All right. And what's the groundwater depth at the terminal site?

A. It's elevation 12, I believe. I would have to double-check.

Q. Okay. But it's clearly not on the surface, correct?

A. That's correct.

Q. And --

A. Practically speaking, groundwater is at the level of the river.

Q. All right. And are all of the soils at the Vancouver terminal site subject to the same liquefaction in the same earthquake, or are there variations across the site?

A. Different types of soil respond to the earthquake differently. The soil above the groundwater won't liquify. The fine-grain soils, the silts and clay that are there, are very resilient to the liquefaction because of the way those soils develop their strength. The sandy and the silty sand soils are expected to liquify. And then deeper, when you get into the

gravels, those materials are dense enough and permeable enough that they are not expected to liquify.

Q. All right. And there's been some testimony so far that -- about a phenomenon known as lateral spreading. Can you describe what "lateral spreading" is.

A. When seismic shaking happens next to usually a very large body of water, the potential for the ground to settle is there, but the bigger hazard is that the ground will settle and move towards the body of water; you'll basically have a slope failure into the river.

Q. All right. And back to liquefaction, because you just noted settlement. Is settlement a consequence of liquefaction?

A. That is the most common consequence, yes.

Q. And is that the greatest risk associated with liquefaction?

A. The greatest risk. Well, a loss of soil strength will result in settlement. If that settlement then turns into something like a discharge, that would be a consequence of the settlement.

Q. All right. With regard to Area 200, the rail loading facility area, what specific seismic risks exist there, if any?

A. I haven't studied Area 200 in great detail. As

I understand, Area 200, there are -- there's rail facilities which are well above the groundwater. The size of those facilities suggest that any loads that are imposed on it when a train is there are going to be distributed and the possibility for surface impacts are minor, but GRI can comment on that in more detail.

Q. Okay. Are there any ground improvements in that area?

A. No.

Q. And is that based generally on the conclusion that you just stated?

A. I believe so.

Q. Okay. Turning to Dr. Wartman's discussion of seismic risks associated with industrial facilities, on pages 15 and specifically 16, if you can look at that. It's a series of photographs.

A. Yes, sir.

Q. Do you see those?

A. I do.

Q. Okay. And there's a heading there that says, these photos are from the 1995 Kobe earthquake in Japan. What do these photographs suggest to you?

A. They look to me like typical examples of what you would expect to see of liquified soil below tanks, provided the soil had not been improved.

Q. All right. And do you know anything specifically about the Kobe earthquake?

A. The Kobe earthquake is one of the earthquakes we learned a lot from. It was a long time ago. We are now much better at designing for earthquakes than they were in Kobe. And at -- the biggest thing is that we're planning to fix the ground, which is different than what these photos would suggest.

Q. All right. And when you say "you're planning to fix the ground," that means the ground improvements that you've designed?

A. Yes.

Q. Okay. And more generally -- or more locally, how does the ground improvements that you have designed compare to the ground improvements you would expect to see at the greater port property or, more generally, along the Columbia River waterfront and industrial areas?

A. All of these ground improvement systems have been used at the port, at other nearby ports in various combinations with each other up and down the West Coast.

Q. And would your ground improvements, comparatively speaking, be more robust than you would expect to exist at other facilities, or at least at older facilities?

A. They are more robust than is expected to exist at -- or than, my understanding, exists at most facilities now, in part because we have learned a lot as time has passed; in part because the design code has changed a lot and the design earthquakes have gotten bigger; and a very large part because the design requirement for this project is very restrictive.

Here we are looking at two inches of settlement or two inches of lateral movement. That is a very, very tight standard. Other major owners, like The Port of Tacoma, their post-improvement criteria are measured in feet. Here we are measuring our post-improvement criteria in inches. So I absolutely expect that what we're doing here to be significantly more than is done at most of the heavy industrial facilities up and down the river and on the West Coast.

Q. All right. And with regard to tanks, Dr. Wartman makes a reference to tanks potentially floating. Do you recall that reference?

A. I do.

Q. And can you just describe what he's referring to?

A. I don't know. The photos he has are of tanks that are settling. If these tanks were under water or underground, they might float. The only way these tanks

are going to float is if the gravitational constant of the universe changes. It's just not going to happen.

Q. And when you say "these tanks," you're referring to the tanks at what -- the tanks that will be built at the terminal?

A. The tanks in Area 300.

Q. Okay. I would like you to turn to page 17 of Dr. Wartman's testimony. He summarizes his primary criticisms of the ground improvements that you have designed, and I think it's the most expeditious way to address his testimony is to just take those on one by one.

So I'm going to start with paragraph 26. I'll just have you briefly look at that while I summarize it. And essentially he says that the secondary containment berm surrounding the storage tank is subject to liquefaction and essentially failure.

Can you address that, please.

A. The berm that we're talking about is roughly six feet tall, the side slopes are two-to-one in the static condition. It is, I believe, 20 feet above the groundwater to be constructed on compacted structural fill overlying the native soil. There's no reason, from a geotechnical perspective, to expect that berm to fail.

Q. All right.

A. If it were to fail, it would fail to a two-to-one and it's already at a two-to-one.

Q. Meaning what?

A. Meaning the side slope. Two horizontal to one vertical, so 23 degrees.

Q. What I meant by my question was, what impact would that have? Would the containment berm continue to function as designed?

A. Absolutely.

Q. Moving on to paragraph 27, Dr. Wartman says that -- in addressing the near dock ground improvements in Area 400, that a liquefaction and lateral spreading event could damage the transfer pipeline infrastructure and result in a release of oil because the ground improvements there do not fully penetrate the liquefiable soils and therefore will not mitigate the lateral spread risk.

Can you address his statement.

A. Sure. The second sentence is factually incorrect. The design intent of the ground improvement in Area 400 is for the stone columns to go all the way down to the gravel layer. Because they go all the way down to the gravel layer, they form a shear key and they are a component of the entire ground improvement system. So in my opinion, because of that, the previous

statement is -- of Dr. Wartman is not correct and the hazard is mitigated.

Q. All right. And in paragraph 28 he says that proposed deep soil mix panels proposed for Area 400, same area, are not well-established liquefaction mitigation technology.

Can you address that clause first?

A. I disagree. They're in textbooks. They're used a lot. I just don't agree. It's not the oldest technique on the continent, but it's one that's used quite a bit.

Q. Okay. And could you just, again, give us a bit of an explanation on exactly what those panels are?

A. A soil mix panel is constructed by drilling a hole with what amounts to an overgrown egg beater. And then when we get to the bottom of the hole, we begin mixing a wet cement with the soil that's there and extracting the -- I'm sorry, I have that backwards.

We begin mixing as we go down, where we combine cement with the existing soil and create what we call SoilCrete. It's not as strong as concrete, but it's much stronger than the existing soil. And the panels help mitigate liquefaction, because they prevent the soil particles between the panels from moving and therefore triggering liquefaction.

Q. All right. Thank you. And then he says, and their design is not supported by sufficient engineering analyses. What's your response to that?

A. In my opinion, the most straightforward way to present an engineering calculation is by hand. So the calculation that's included in the design package is a hand calculation. I think it's the most straightforward way to present that.

There are certainly other analysis techniques, but the idea that a hand calculation is somehow not valid, I just disagree with. And one of the main reasons, because we did a lot more than just that. We have an incredible amount of subsurface information for this project. Normally a geotechnical engineer gets a few explorations and develops an idealized cross section and then evaluates that. We had on the order of 45 explorations, which is, in my experience, almost unheard of. So rather than generating a standard soil cross section, we evaluated every single soil profile we encountered, all of the borings, all of the CPTs. We provided calculation sheets for those. We predicted unimproved settlement. We predicted post-improvement settlement. It's a very comprehensive evaluation.

We did develop a generalized soil profile as part of our work, and that's included in the package as

well, but that's not the only thing we did.

Q. All right. And now I'm going to draw your attention to paragraph 29 and just have you read that.

A. You want me to read it?

Q. Let me go ahead and read it. I just want you to be looking at it because I want you to carefully read what it says and listen to it as I do so. So he says, "Ground improvement in the tank to shoreline pipeline area (Area 500) does not fully penetrate liquefiable soils, leaving the ground failure hazard unmitigated. Ground failure at this location could damage the pipeline system and cause a release of oil."

How do you respond to that?

A. I have no idea what he's talking about. There are no ground improvements in Area 500. So I just don't know what he's talking about. I think perhaps he's referring to Area 300, where the draft EIS did notice that the ground improvements do not go all the way to the bottom of liquefiable soil. That's true. They don't need to. And the review of the design indicated that all of the work in Area 300 is expected to result in no seismic hazard in Area 300.

Q. All right. Turning the page to page 18, there is a long paragraph there, but about -- well, on line 8, halfway down the paragraph, of paragraph 30, there's a

sentence that says, "The comment letter also opposes the suggested use of modern numerical engineering analysis and design methods; e.g., programs FLAC or PLAXIS, over highly simplified 'pseudostatic-type' engineering models which the current project design is based upon."

What is Dr. Wartman talking about?

A. I opted not to do a highly sophisticated finite element model for this project. I made that decision because of the magnitude of the information we have. I was not a fan and am not a fan of a highly-simplified single-soil cross-section profile.

I have a lot of experience working with PLAXIS. I have seen it used and abused because it is very complicated. It is very easy to make the program say what you want it to say.

As a design engineer, I don't want a tool like that. I want a tool that tells me what I need to know. If I knew the answer, I wouldn't need the tool in the first place, and I'm happy to go on in as much detail as you like.

Q. I don't think we need to go into too much detail, but I think just a basic explanation of what FLAC or PLAXIS is would be helpful.

A. PLAXIS is a two- or three-dimensional finite element modeling program where highly specialized soil

properties that we haven't really measured are input into the program, the geometry of the system to be analyzed is input into the program, the ground motion characteristics are input into the program and if all of that is done properly, it results in a prediction of settlement or lateral movement.

Q. So it's a model. And you performed modeling as well; is that correct?

A. I have. And sometimes I do in the course of my work now. I just don't think it's appropriate for this site.

Q. And what -- by saying "you did modeling," I meant you did modeling for this project?

A. Absolutely. I modeled this site using limited equilibrium techniques. I modeled this site using pseudostatic techniques. But I didn't just pick one off the shelf. I used one that has been statistically validated using tens of thousands of earthquakes to make sure that it gives a number that is believable.

There was a lot of thought put into how do we solve this problem. Probably the most important input parameter to the pseudostatic model is the strength of the soil when it liquifies. The values in the literature range somewhere from 20 degrees to 10 degrees. My analysis used 10 and a half. I

validated that by comparing my post-improvement -- my preimprovement lateral spreading calculation to the preimprovement lateral spreading calculations done by lots of others, and in order to get my preimprovement numbers to match theirs, I would have needed to use a liquified strength of 20. So I'm including a factor safety of two on that specific parameter.

Q. All right. Do you -- is Vancouver Energy amenable to verifying your modeling using the FLAC or PLAXIS approach?

A. In my opinion, a good design, a competent design, should be looked at lots of different ways, and I personally am looking forward to the opportunity of showing that the way we did it works -- the system we put together works, no matter how you look at it. The first step in that process has already been scheduled and, yes, we are preparing to do that.

Q. All right. I want to ask you a question about the design standard for the ground improvements, specifically the International Building Code and the code cycle and whether or not the ground improvements are designed to the -- well, let me just ask the question. Which year version of the IBC is your design conformed to?

A. The design conforms to IBC 2012. IBC 2012

relies on ASCE 710 for 2010, and ASCE 710 relies on USGS 2008. So there's always a lag between the code, ASCE 7, and the USGS. The expectation is in the next code cycle, the USGS required ground motions will go down and the hazards that would be designed to in the future are very slightly smaller than what's called for now. I think that's in part because there's been such a large jump up in this code cycle. I think the earthquake comes down by like .01 PGA. Not much.

Q. So is it fair to say that the ground improvement design would conform to the 2016 IBC?

A. Based on what I know of all of the anticipated changes, yes.

Q. All right. And finally, if you could look at page 18 of Dr. Wartman's testimony, and he -- I'm looking at, again, paragraph 30, last sentence, because he has spent some time criticizing the ground improvement design, and then he goes on to say, "Nevertheless, even if this mitigation plan is later modified or enhanced, it should be recognized that there are no mitigation measures capable of completely eliminating geologic risks at the facility."

How do you respond to that statement?

A. I guess there's two responses. The first is, there's nothing we can do to stop the earthquake. No

one is suggesting that we're going to go hundreds of miles away and prevent the earthquake from happening. There is that -- that's something that we expect to happen, so to that extent he's right. The earthquake will happen and we are expecting it to happen.

But we're going to fix the ground, and Dr. Wartman himself has published papers talking about how ground improvement does work to prevent liquefaction and lateral spreading and the associated geotechnical hazards related to an earthquake.

Q. All right. And I know I said "finally," but I actually have one last question. I just wanted to wrap something up.

Earlier when you were talking about the unloading facility and the lack of ground improvements, you talked about "load." How does the load -- or expected load affect the ground improvement design?

A. The ground improvement design is not just to prevent liquefaction. The ground improvement design is also to make sure the tanks don't settle -- the tanks or other areas that have ground improvement don't settle under static conditions more than is acceptable.

For this project, the tanks are allowed to settle something on the order of two inches in the static case. Much like the lateral spreading hazard,

that is a very strict settlement tolerance.

Right now I've got a project where they're hydro testing and four inches is expected. If these tanks were in Louisiana, a meter would be perfectly acceptable. So two inches is a very tight standard. So the ground improvement has been designed to carry the weight of the tank if it was full of water, because that's heavier, and to settle the expected amount when it's full.

Q. All right. So is it fair to say that the greater the expected load, the more robust the ground improvements need to be?

A. Yes.

Q. Okay.

MR. JOHNSON: No further questions.

JUDGE NOBLE: Cross-examination?

CROSS-EXAMINATION

BY MS. BOYLES:

Q. Morning, Mr. Rohrbach.

A. Morning. Now I see why it's so hard to look at you and talk to the mic.

Q. You're all right. Just look at them. My name is Kristen Boyles and I represent some of the intervenors in this case. Just a few questions for you this afternoon.

As I understand it, you are the person who is ultimately responsible for the ground improvement design; is that correct?

A. That's correct.

Q. And, again, as I understand your testimony, you used a peak ground acceleration of 0.37; is that correct?

A. That's one of the earthquakes we evaluated.

Q. Okay. And that -- you were explaining that earlier. It was 0.37 when you're talking about magnitude 9 and it is a different PGA -- peak ground acceleration when you're talking about a different kind of earthquake or a lower magnitude earthquake?

A. When you're talking about a closer earthquake, these closer earthquakes happen to have a magnitude in the six and a half to 7 range and a PGA that is about .45.

Q. That isn't in your written testimony, is it? I don't recall that from your written testimony. I'm just --

A. That's correct, it's not in the written testimony because -- for two reasons. It wasn't a contractual requirement, but more importantly because it's kind of obvious that the smaller earthquake doesn't do as much damage as the big one. We obviously checked

it, but I didn't feel the need to generate a second document of that size for something that is that obvious.

Q. May be obvious to some.

A. I agree. I'm sorry.

Q. If there's an earthquake, these various columns, deep soil mix panels, cementing techniques, SoilCreting techniques, they aim to prevent those areas from liquifying and either settling or moving laterally. That's the basic idea; is that right?

A. And the areas around them, yes.

Q. All right. Let me ask you about the areas around them. What happens to the areas around these ground improvements that don't have the ground improvements?

A. It depends on the specific technique you're talking about. If we're talking about stone columns, the installation process moves the ground. So we're going to lower a -- what we call a Vibroflot into the ground. That vibrator is going to shake, it's going to induce energy into the ground and it's going to make the soil particles get closer together. As those soil particles get closer together, they get stronger. We can see densification benefits five and six feet away from the point that the vibrator is inserted.

If we didn't backfill the insertion point with a strong gravel, we would settle the entire site. By backfilling the point of insertion with gravel, we are not only densifying the soil, but also adding a material that is stronger and helps to reinforce the soil and lock it together.

Q. Let me switch areas. I think -- I believe that's the columns in Area 300 under the storage tanks that you're talking about?

A. That's all stone columns. There's stone columns in Area 300 and in Area 400.

Q. So in Area 400, which is the marine terminal, my understanding is you propose a block of concrete that's about 160 feet along the river, 72 feet wide -- does that sound about right?

A. In the dock area, yes.

Q. In the dock area. And at the southern end of that area, you need to fully replace all the soil; is that correct?

A. So in Area 400 there are two design cases. There's the dock proper and then there's the pipeline approach to the dock proper. At the dock area, the pipe is turning to the right to the river and getting closer to the settlement criteria, and the movement criteria at the dock are measured at a point much closer to the

river. In order to accomplish the two inches of movement at the dock, we are using a nearly 100 percent replacement ratio so that we can key that entire block into the non-liquefiable soil so that it doesn't move.

Q. Am I correct that it's your opinion there is no chance of the deep soil mixing panels at Area 400 liquifying and displacing toward the river?

A. No. We're expecting them to move less than two inches, but we're expecting them to move slightly -- the material in front of those will move more than that.

Q. On Table 3 of your written testimony, you list four projects as successful examples.

A. I list four projects as examples of combinations of ground improvement where the various techniques we're using here have been used. There are many more.

Q. Indeed, I believe you call them successful, though. That's --

A. Yes, they are -- they have been successful, though, in the purposes of seismic mitigation, if they haven't been subject to an earthquake yet, they haven't necessarily been tested.

Q. I guess that was where I was going with that question. Are any of these examples in Washington?

A. None of those are, no.

Q. And it doesn't appear to me that any of those

are oil storage or shipping terminals either?

A. That's correct, none of those are.

Q. Is it your opinion that no further modeling is needed for this project?

A. As I said before, I am happy to demonstrate that the design we've come up with will work. When you switch from one -- from one analysis technique to another, you bring in a different set of problems that you need to solve. One of those is the generalized soil profile. Another of those is the sophistication or the accuracy with which you know those input parameters.

I'm certainly not opposed to it. I just think we need to understand the limitations of all of the techniques we're using and what they tell us. This is a highly, highly three-dimensional system in Area 400, and the computational horsepower is in the academic research stages for a 3D model.

Q. Okay. And there is an exhibit that was -- it's Tesoro Savage Exhibit 362. Is that a letter about doing some of that further modeling? Are you aware that there's a June 7th, 2016, letter about some further investigations?

A. I'm aware there's a letter. If you tell me that's the exhibit, I'd certainly believe you.

Q. Okay.

A. I helped write some of those. As a design engineer, I have to stamp and say something's going to work based on an analysis technique I believe in. I am not convinced that technique will meet my personal standard. I'm certainly not opposed to having that analysis done and better informing the analysis I had, but it will not be the basis of any design I stamp. It can be a validation of my calculation, no problem at all.

Q. Does your design consider the cumulative impacts of aftershocks?

A. Yes.

Q. Do you have any concerns about the contaminated soils at this site in an earthquake?

A. There are no -- as I understand it, there are no contaminated soils in the vicinity of the ground improvements. So beyond that, I'm just not qualified to comment.

Q. Do you know what risk category the tanks are designed to? I believe they're designed to Risk Category 2. I am just trying to verify that.

A. I don't know the structural details of that design. GRI can talk about site classes and that kind of thing. That's just beyond what I do.

Q. Okay. I guess a final question is, is it your

opinion that your design will fix the ground enough to prevent any harm from an earthquake that happens here?

A. My design will improve the ground or fix the ground so that it moves the amount that it's allowed to move. It will settle. It's expected to settle an inch or two. If we want to call that harm, then we're not preventing all harm. We're limiting the amount of movement to something that is acceptable.

MS. BOYLES: Thank you.

JUDGE NOBLE: Is there further cross-examination?

MS. BOYLES: No, Your Honor.

JUDGE NOBLE: Redirect?

MR. JOHNSON: Nothing, Your Honor.

JUDGE NOBLE: Council questions?

Mr. Stone?

MR. STONE: Good afternoon, Mr. Rohrbach. Following up on the question about Table 3 and those projects that utilized these soil -- or ground improvement techniques, are you aware of any projects elsewhere in the country or around the world that have used these ground improvement techniques and experienced the design earthquake and performed as intended?

THE WITNESS: I am aware of two instances in recorded human history where the design of earthquake

has occurred. One of those is Japan and one of those is Chile. I do not know if the -- in Area 300, where it's just stone columns, yes, they performed fine. Yes, in the Tohoku earthquake, the systems worked fine. I do not know if the soil mix stone column buttress panel has been used in Japan. I do know that the DSM panels have been used in Japan and did perform well in both Kobe and Tohoku.

MR. STONE: And where was it where the stone columns were successful?

THE WITNESS: I don't know that I can give you a specific earthquake. They've been successful in California, though that's not a magnitude 9. The well-publicized nuclear failure, the ground did fine until the tsunami came, and there were stone columns there. That's the best I've got.

MR. STONE: How about testing these ground improvement techniques in the laboratory with physical models? Has that been done at all?

THE WITNESS: There's been a lot of ground improvement testing with physical models. One thing we didn't touch on earlier was, in the field, we actually will verify what we have accomplished the ground densification through in situ testing. All of the techniques we're talking about have been evaluated

fairly extensively in academia. In particular, we're to the point in academia where we're not questioning whether they work; we're trying to decide if -- we're working on the reinforcement component at the second and third decimal place. That's the accuracy with which we can do that.

MR. STONE: So is it fair to say that these ground improvement designs that have been developed have benefitted from testing in the laboratory and use of physical models?

THE WITNESS: Yeah.

MR. STONE: Okay. Thank you.

JUDGE NOBLE: Other council questions?

Mr. Siemann?

MR. SIEMANN: Thank you. And thank you for your testimony thus far.

You testified I think that for the areas that are -- that are -- the soil currently as not reinforced would liquify; is that correct?

THE WITNESS: Yes.

MR. SIEMANN: What would happen -- what would you expect to see in the unreinforced soil as it is now liquefication? What would actually occur for that soil and for anything that was on it under a design earthquake of 9.0 and .37?

THE WITNESS: I would expect the ground to liquify and whatever's on top of it would go down.

MR. SIEMANN: And down by how much?

THE WITNESS: It would depend on the size of the earthquake. If we're talking about a magnitude 9.37, many inches, eightish. I would not expect a varying capacity failure or a catastrophic failure, because the depth of the groundwater is so far down. The soil between the groundwater and the supported element, whether it's a tank or a -- not a tank, but a rail line, it's not going to have a bearing capacity failure.

MR. SIEMANN: And would it decline uniformly or would it perhaps decline nonuniformly?

THE WITNESS: It would most definitely be nonuniformly.

MR. SIEMANN: And you sort of touched on where I'm going here, which is, as I understand from testimony yesterday or the day before, the areas under the railroad tracks are not going to be reinforced; is that correct?

THE WITNESS: That's my understanding.

MR. SIEMANN: So what do you expect to happen in a design event to the railroad tracks and to, for example, a loaded railroad -- set of railroad cars

or train, unit train, on those tracks under that condition?

THE WITNESS: In very general terms, I would expect them to settle. In more specific terms, I would have to defer to GRI. They were associated with the evaluation of that area. I haven't looked at a geotechnical exploration for that area.

MR. SIEMANN: Do you know why it is that the railroad tracks areas are not going to be reinforced?

THE WITNESS: Based on conversation with the GRI, my understanding is it's not needed, but I would have to defer to GRI.

MR. SIEMANN: Thank you.

JUDGE NOBLE: Mr. Rossman?

MR. ROSSMAN: Yeah, thank you for your testimony. I just have a couple of questions. I understand how you're testifying that the ground will perform in a designed earthquake, and I'm wondering what happens in an earthquake exceeding the design earthquake. And I'm wondering, firstly, is your testimony that the design earthquake is kind of the maximum that would occur at the site, or just that it is the threshold to which the facility is to be designed pursuant to code?

THE WITNESS: I don't believe there is the

possibility of an earthquake bigger than magnitude 9 happening on the West Coast. The USGS has -- and the reason a lot of the testimonies talk about magnitude 8 or greater, is because experts in the field simply don't agree that a -- that the Cascadia can generate a 9. It is certainly conservative to do that and I think most engineers design to a 9.

Did I answer your question, or did I stop short?

MR. ROSSMAN: What about peak ground acceleration?

THE WITNESS: The peak ground acceleration is a function of where the earthquake happens and where the site is. On this site, three different people performed three different independent analyses. GRI did theirs and came up with .37. I did mine. I ended up in the vicinity of .34, .35. I don't remember. And then as part of the peer-review process, AECOM also did an independent analysis, and their earthquake was also smaller than the one that we're using. So it's highly, highly, highly unlikely that an earthquake bigger than the one we're using will occur at this site.

MR. ROSSMAN: That's helpful. So the analysis -- the parameters for that analysis are based on what physically could happen at the site, or based on

what's likely to happen within some rate of return?

THE WITNESS: The design earthquake is the 2475 earthquake. And that has more to do with the development of all of the earthquakes you're going to throw into the bag and pull out, than what is geologically possible. I did not delve into the specific geology, and GRI can probably comment more on that than I.

MR. ROSSMAN: So conceivably there's a 5,000-year earthquake that would exceed this design capability?

THE WITNESS: To my knowledge there is no geology in the region that will produce an earthquake bigger than this one. When you start talking about 5,000 year and 7,000 year, you really get into the likelihood that it's going to happen, not necessarily how big it is.

MR. ROSSMAN: Okay. So I --

THE WITNESS: Put another way, the 2475 earthquake is defined as 2 percent exceedance in 50 years. The geology is the same, whether it's 2 percent in 50 years or 1 percent in 50 years.

MR. ROSSMAN: I guess that's what I'm wondering about, because I did see that in the testimony, the 2 percent exceedance in 50 years, you

know, which is in the life of the project somewhere on the order of half to 1 percent exceedance if the project's going to be 20 years, and I know it doesn't work exactly that way. But just for rough purposes, I mean, I found myself saying, so is that effectively saying that there's somewhere on the order of just under a 1 percent chance that an earthquake larger than this will occur within the life of the project?

THE WITNESS: That's not how the hazards aggregation works, and I really think that GRI is better able to get into that. I kind of stop at the USGS saying, these are the earthquake sources, and go from there.

MR. ROSSMAN: Thank you very much.

JUDGE NOBLE: Mr. Shafer?

MR. SHAFER: I have a question. Mr. Rohrbach, thank you very much for your testimony today.

My question, if you could clarify for us -- and I'm wondering if your design incorporated factors of safety specifically relative to the material type, and by that, I mean, let's suppose a scenario where all of this was occurring with, let's say, lumber or logs, and the only -- so let's say that the locations are the same, they're being stored in the same place. Let's say

all the other dimensions are the same, your weight, size, all of this, loading factors.

Are your factors of safety or anything in your equations materially different as a result from the material type itself, considering the hazards of the material? So meaning would -- if all of this was -- let's say it's logs instead of oil. Is your design the same as it is right now, or have you increased the factors of safety to provide even yet a further conservative or a far more secure site by virtue of the fact it's oil?

THE WITNESS: First, I would like to say that we always evaluate settlement based on the actual weight of the material we're talking about. It doesn't matter what it is, because we want to be as accurate as we can. So when we're talking about how much settlement we're going to get, no, we use the actual weight.

When we're talking -- and I'll first respond to the static condition, then I'll get to the seismic condition. If we're talking about a bearing capacity-type issue, which is to say, is the item, wood or oil or something else, simply too heavy for the ground, then, yes, we do include a factor of safety.

For a site like this I would expect that factor of safety to be something on the order of two, I

don't remember off the top of my head what I used, but we would expect the bearing capacity to be at least twice and sometimes three times as much as actually required.

In terms of seismic settlement, much like in the static case, we used the actual loads applied. And the way we address the hazard associated with the material itself is in the amount of settlement that we're allowing relative to how much settlement the containing structure, in this case the tanks, can tolerate. So we are allowing two inches of settlement here because of the nature of the material being stored. If we were storing lumber, we would probably allow something on the order of a foot.

MR. SHAFER: Let me ask this. If there was a driving purpose to make absolutely sure that the ultimate threshold was there's no possibility of oil from the tank to the sites to get the river, would that materially alter your design?

THE WITNESS: There's always more you can do. If you want there to be zero chance, I think from an engineering perspective that is just about as close to impossible to get as there is. But if you wanted to design something like that, you could, I think. I know that BPA practically doubles the design earthquake and

they have come up with systems that they think will work. If that was the expectation, we would need to change our design.

MR. SHAFER: Thank you.

JUDGE NOBLE: Other council questions?

Mr. Lynch?

MR. LYNCH: Thank you, Mr. Rohrbach, for your testimony.

I would like to start by saying when our ALJ said that you were a fast talker at the beginning of your testimony, she meant that in the nicest way possible.

THE WITNESS: Okay.

MR. LYNCH: I'm taking a look at the use of stone columns, and in Area 300, the stone columns don't extend all the way to the non-liquefiable soil, but they do so in Area 400. And you were saying that they -- I believe your prefiled testimony and your testimony today, that they don't need to. Can you explain a little bit more why they don't need to?

THE WITNESS: The goal of the design in Area 300 is to provide two inches of settlement in the seismic case. We have treated to a depth on a tank-by-tank basis using all of the information we have to provide a design that provides no more than

two inches of settlement for the lowest cost possible. We could certainly go deeper. That would result in less settlement, but the settlement tolerances are already quite tight and I don't know that there would be a meaningful benefit to the project in doing so.

MR. LYNCH: And you did mention that you were essentially saying you didn't think it was cost-effective to do that, but I'm just wondering how much -- have you projected how much further you would need to go down in Area 3- -- excuse me, Area 300 to hit the non-liquefiable soil and how that would translate into cost?

THE WITNESS: I have not done that exercise. It wouldn't be hard to figure out how much longer they needed to be. I simply haven't worked through that.

MR. LYNCH: And you've mentioned that stone columns have been around for a while, and you've indicated that they've worked. But do you know any instances where there's been an earthquake and the stone columns didn't penetrate all the way down to the non -- to the non-liquefiable area and they've held?

THE WITNESS: I think it's fair to say that more often than not the stone columns don't go to the non-liquefiable layer, to the bottom of the non-liquefiable layer. Speaking now of all of the

projects I've worked on in the greater Seattle area, less than half go to the bottom of the non-liquefiable layer. In some areas, that's hundreds of feet down.

MR. LYNCH: Let me stop you for a second. I was saying to the non-liquefiable area and now you're saying to the bottom of the non-liquefiable area. Can you just please tell me, do you normally have to go to the bottom of the non-liquefiable area?

THE WITNESS: I should clarify, then. Perhaps I misspoke. We don't usually go to the top of the non-liquefiable layer or to the bottom of the potentially liquefiable layer. In a soil profile that is, say, 150 feet or so of liquefiable soil, it is relatively common to stop at 50 feet. It depends on the structure and the settlement tolerances and the expectations of the structure. But not going all the way to the bottom is not uncommon.

MR. LYNCH: You also testified that you didn't think using the PLAXIS model was appropriate for this site, and I'm really interested in that. Why is that?

THE WITNESS: I don't think it's necessary because it adds a degree of uncertainty -- well, it moves where the uncertainty is in the analysis from one location to another. And I'm just not comfortable with

that.

If you talk to some world-class modelers, it's really hard to get the three-dimensional component of this system into a finite element model. I'm happy to give you as much detail as you want there. I mean, we can talk about stress changes and all kinds of stuff.

MR. LYNCH: No, that's okay. But you have used PLAXIS?

THE WITNESS: Before coming to Hayward Baker, I was in consulting. I actually sold PLAXIS. When you dialed 1-800 need help for PLAXIS, the guys in my office answered the phone, and in that capacity, I saw people using it to give them the answer they wanted.

MR. LYNCH: And I wasn't sure in an answer to a question from I believe your attorney, I think you said -- the question was, were you willing to evaluate your design under PLAXIS? I think you said, well, you think your system works. So I'm asking you that question that you were asked previously. Are you willing to evaluate your design under PLAXIS?

THE WITNESS: Sure. I mean, we expect that to happen. I don't think it's necessary. And like I said, I welcome the opportunity to prove that it's going to work using a different technique. I think a good design works, works no matter how you look at it. But

when you use that technique, you need to understand that you are introducing a different set of variables.

MR. LYNCH: If I remember correctly, when you were looking at an earlier geotechnical report, one of the concerns is that the containment berm could collapse in the event of an earthquake because it wasn't -- the soil wasn't reinforced and that -- of course, if you're -- if you have a containment berm with the idea that you're going to keep all the oil within the containment berm, if the containment berm, in fact, then collapses, you've undone the reason for putting in a containment berm. So am I first correct in saying the area of the containment berm is an area that is not being reinforced?

THE WITNESS: Yes, the area below the containment berm is not being reinforced. And like I said earlier, I don't think it needs to be, because I don't think the potential for the berm to fail is a real thing. GRI can talk about this some more, but ultimately it's a six -- it's a berm that's just six feet high. It's built on non -- it's built on soil that is non-liquefiable for the top 20 feet. The failure surface that would be generated is all within the non-liquefiable soil, so it won't liquify.

MR. LYNCH: Thank you.

JUDGE NOBLE: Are there other -- Mr. Moss?

MR. MOSS: I have I think just one question. And that is, what is the settlement tolerance of the tanks?

THE WITNESS: I have designed to two inches. I do not know how much the tanks themselves can take.

MR. MOSS: You knew that when you designed to two inches, though, I hope?

THE WITNESS: I know that similar tanks, like the ones that are currently being filled up north, can handle a lot of settlement. And really what mattered when it comes to tank settlement is not how much vertical movement they get, but it's how much plane or tilt the tank can tolerate and how much out-of-plane movement the tanks can tolerate. The design very specifically -- and there's calculations in the submittal that address plane or tilt and out-of-plane settlement, and in those cases we're working to API.

MR. MOSS: Now I have more than one question. Plane or tilt could occur, I presume, if -- on, say, one side of the tank you had the two inches of settlement and that did not occur on the other side of the tank?

THE WITNESS: That's correct.

MR. MOSS: So that would be a possibility,

then, here?

THE WITNESS: That's something that we're -- that we designed for, yes.

MR. MOSS: Okay. But don't you need to know what the tolerance of the tank is to know that you're designing to an appropriate standard? That's what I understood you to say earlier. That's why I asked the question. I thought you were going to tell me five inches or something.

THE WITNESS: Someone needs to know. And when the tank designer says these -- the tank designer decides if the tank can settle four inches or five inches or six inches or two inches, but when he tells the ground improvement designer, I can design to two, that's what I work from.

There may be a factor of safety in there for his tank. I don't know. I would expect the tank to be able to handle several inches of total settlement, two to four inches of plane or tilt and, you know, typically API for out-of-plane movement, but I haven't looked at the specifics of this tank.

MR. MOSS: Okay. Thank you very much.

JUDGE NOBLE: Mr. Rossman?

MR. ROSSMAN: Just one more question that I forgot to ask earlier. It seems like not all of the

infrastructure needed to serve the fire systems is on areas with ground improvements. There's some at the tank cars, and then there's also just the water lines leading to the facility. And so I guess, would you expect in the design earthquake for those systems to keep operating?

THE WITNESS: I'm not sure that's true. I know that we have put a lot of effort into making sure that there is ground improvement below the control structures by the dock. If there are system-required elements outside the ground improvement, it would depend on their foundations and their size. But they certainly could settle. I just -- my understanding was the critical ones were located by the dock and were under the ground improvement.

MR. ROSSMAN: Thank you.

JUDGE NOBLE: Any other council questions?

I have one.

This may be beyond your direct, but I didn't hear you mention the possibility of flooding. How did you consider that in your ground improvement design? Catastrophic flooding.

Understanding that this may be beyond the direct, but I would still like to ask about whether and how, if you did, consider the effect of possible

catastrophic flooding in the area of the ground improvements, what would happen then?

THE WITNESS: I did not look at flooding ground improvement. It strikes me as very unlikely, but I didn't look at it. We are only treating to the ordinary high-water mark. So if you're talking about flooding of the river itself, we would be landward of the high-water mark. But I haven't looked at that in great detail.

JUDGE NOBLE: Thank you.

Are there any questions based upon council questions?

MS. BOYLES: I have one, Your Honor.

RECROSS-EXAMINATION

BY MS. BOYLES:

Q. And this is just a follow-up to the conversation you were having with Chair Lynch about PLAXIS. One of the things that you've said several times is that the problem with PLAXIS is it can be used to get an answer you want. But you don't have to use it that way, and I assume you won't use it that way. So what is -- what is the other problem -- or what is the -- what is a different problem with PLAXIS?

A. The model we're looking to use is called FLAC, not PLAXIS, just to clarify. The most -- so this is a

technical answer, and I apologize for that.

Probably the most widely used software for this is FLAC and probably the most commonly used soil constitutive model, which is to say, the way we predict the way the ground is going to respond to the earthquake, when the soil particles move across each other and compress the water, doesn't account for the stress reversal that occurs when you vibrate stone into the ground and push the stone outward.

That particular model assumes that the largest force acting on the system is coming from above, coming from the weight of the soil and the weight above it. But when you force the soil out, the largest force acting on the soil is coming from the side; it's called a principle stress reversal. And if you talked to the folks who make the software, their software doesn't account for that. So you are immediately into a 2D problem to solve a 3D system.

MS. BOYLES: Thank you.

JUDGE NOBLE: Any other questions based upon council questions?

MR. JOHNSON: Yes, Your Honor.

Ms. Mastro, could you please pull up Exhibit 362.

REDIRECT EXAMINATION

BY MR. JOHNSON:

Q. And while we're doing that, I would just like to ask you a couple of questions. In your professional opinion, is the ground improvement design adequate to address the risk associated with the design event earthquake? And I realize that's an oversimplification, but --

A. Yes.

Q. Okay. And can you provide the council some context of -- with regard to what might be expected beyond the terminal in terms of consequences of an earthquake approaching the magnitude and PGA of the design event earthquake?

A. You're asking me what would happen regionally if the subductions --

Q. What would happen, say, in the city of Vancouver in terms of structural failure, et cetera?

A. In simple terms, I think when the subduction zone earthquake happens, I would prefer to be in Kansas, and I think that most of the major infrastructure around here is going to have some significant problems.

The ports of Tacoma and Olympia are expecting two -- I'm sorry, the Port of Tacoma -- the ports of Tacoma and Seattle are expecting lateral spreading

measured in units of feet. What's expected here is measured in units of inches. I think most of the facilities along the Columbia should be expected to fail in a fairly spectacular way. A lot of the bridges are likely to fail. Oregon and Washington have both spent a tremendous amount of money upgrading the main infrastructure. The various counties, some have. That's a very expensive thing, so some haven't.

I think it was in 2001, there was a study done about what the economic impact would be, and in simple terms, I think the I-5 corridor is going to turn into an island. It's going to be very hard to get resources, fuel, food, that kind of thing in. And I think that this system would result in one of the few dock areas that was still serviceable.

Q. All right. Thank you. I'm going to draw your attention to the exhibit that's 362, and I realize that's probably hard to read.

MR. JOHNSON: Is there any way we can blow that up or -- okay. There we go.

BY MR. JOHNSON:

Q. Just so you can focus on the first paragraph. I think it's well-established at this point that you're not a big fan of FLAC/PLAXIS, but I asked you a question earlier about Vancouver Energy's commitment to proceed

with that modeling notwithstanding your reservations about it. And I just draw your attention to the sixth line down, beginning -- that says, "We are willing to explore completion of the additional analysis in an effort to resolve questions raised in the DEIS" -- and obviously we don't want to go too far down that road.

So is it your understanding that Vancouver Energy is prepared to engage in FLAC modeling in this case?

A. Yes. I believe a first meeting to discuss the details of that process and what that model is going to look like has been scheduled for July -- it's either 22nd or 24th. And the idea is because this is so sophisticated and the review can be cumbersome to explain to the reviewers what we are endeavoring to do before we do it so that there can be acceptance or approval -- I mean, I don't want to imply that the reviewers have a degree of responsibility, but to make sure they are okay with the path we're taking. It's not intended to be a 3D model. It's intended to be a pseudo-3D model, because like we said, there's just not a 3D model out there that will work.

Q. All right. Thank you.

MR. JOHNSON: Nothing further, Your Honor.

JUDGE NOBLE: There being no other -- I'm

sorry, there is a question.

Mr. Snodgrass?

MR. SNODGRASS: One quick follow-up question, just in response to the last question. I don't know if you're -- this is within your charge, but what level of earthquake would be sufficient to -- in the rail corridor outside of the terminal, what level of earthquake would be sufficient to likely cause a derailment of a loaded train?

THE WITNESS: I have absolutely no idea. I haven't looked at the rail study outside the terminal.

MR. SNODGRASS: Thank you.

JUDGE NOBLE: Are there any more questions from anywhere?

Thank you. Mr. Rohrbach, you are excused as a witness. Thank you very much for your testimony.

THE WITNESS: Thank you.

JUDGE NOBLE: Would you call your next witness, Mr. Johnson.

MR. JOHNSON: Yes, Your Honor. The applicant calls Matt Shanahan.

If you could just remain standing to be sworn, please.

JUDGE NOBLE: Would you raise your right hand, please, Mr. Shanahan.

(Witness sworn.)

JUDGE NOBLE: Thank you. Please be seated.

You may proceed, Mr. Johnson.

MATT SHANAHAN,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. JOHNSON:

Q. Mr. Shanahan, can you state your full name for the record and spell it, please.

A. Matt Shanahan, M-a-t-t S-h-a-n-a-h-a-n.

Q. All right. Thank you. And could you pull your microphone up and make sure it's on. There should be a little green light there.

MR. JOHNSON: And, Ms. Mastro, you can take that exhibit down if you'd like.

MS. MASTRO: Thank you.

BY MR. JOHNSON:

Q. You set?

A. Is it on?

Q. Yes. Okay. Mr. Shanahan, I understand you're employed by GRI; is that correct?

A. That's true.

Q. And you performed the geotechnical analysis at this site; is that right?

A. That's right, we did a geotechnical

investigation of this site.

Q. Okay. And you provided prefiled testimony already in this case; is that correct?

A. I did.

Q. All right. And your qualifications are set forth in a CV attached to that prefile; is that right?

A. Correct.

Q. All right. Mr. Shanahan -- and by the way, have you been here in the room while Mr. Rohrbach was testifying?

A. I was.

Q. All right. What I would like to do here is not repeat the questioning of Mr. Rohrbach, but hopefully you've benefitted from some of the questions posed by the council and we can focus on the questions that he referred to GRI. Okay.

So I have a handful of questions I'd like to ask you here. And I guess -- first of all, I would ask if you generally agree with his basic explanation of how the earthquake events were analyzed for this site?

A. Yeah, I do. I basically agree with the way he came up with his numbers, if that's what you're asking.

Q. All right. Okay. And you also, I should just note, included your geotechnical analysis -- or the client included your geotechnical analysis in the

application for site certification; is that right?

A. That's true.

Q. Okay. Now, Mr. Shanahan, there were some questions about the geotechnical analysis or the need or lack thereof for ground improvements in Area 200, the rail loading facility. Did GRI recommend ground improvements in that area?

A. Well, for most of the facility, GRI didn't recommend ground improvements, but rather we provided design criteria to the facility designer so they could determine whether they could use conventional foundations, pile foundations or whether they needed to look at something like a ground improvement.

In Area 200, we gave them things like guesstimates of the seismic settlement that they could expect and that they would need to design for. We didn't recommend ground improvements. We listed it as an option, as something that could be used.

Q. All right. And can you just generally describe your conclusions with regard to the soil conditions in that area?

A. The seismic conclusions?

Q. Yes.

A. Yeah, well, so we concluded that there was a risk of seismic settlement due to liquefaction of the

soils in that area in the earthquake event, code earthquake. Significant settlements. They were larger than 12 inches, or something like that.

Q. And -- I'm sorry. Go ahead.

A. Yeah, I mean, what we provided were those types of criteria, and we also provided foundation criteria that they could use to design the support of the elements that are in that area, the rails and the transfer pipeline and some buildings. So those included spread foundations, conventional spread foundations, and pile foundations. And it's my understanding that in the area where there's a pipeline to support, they are going to use pile foundations to limit seismic settlements to levels that the piping can take.

Q. Okay. And I guess I'm trying to focus on Area 200 where the rail loading facility is presently constructed.

A. That's where I'm talking about. Area 200 has a pipeline --

Q. No, I understand. What I'm trying to focus on, is there have been some questions about potential impacts on trains on the tracks in the area -- in Area 200. So I'm trying to focus on that area.

A. Okay.

Q. That more specific part of that area.

A. I'm sorry, can you say -- what do you want to know about the trains?

Q. There have been some council questions about what could be expected in the event of the design earthquake occurring, okay, to the tracks themselves or trains on the tracks.

A. Yeah, I think the tracks will settle similarly to the settlement estimates that we made for that whole area. I'm sort of echoing what Mark said, the tracks are probably going to settle. I don't know if that's a problem with the trains if the tracks settle a little bit.

Most of this facility is on a site that has 15 to 20 feet of compacted structural dredge sand fill over it and the groundwater depth is, you know, between 15 and 25 feet deep. So you have a thick cap of soils -- foundation soils that aren't susceptible to liquefaction.

What's underneath that is going to settle and for that reason what's at the surface will settle, but I don't see there being a risk of bearing capacity failures of a railroad, you know, with a train on it because of an earthquake, because it has such a thick, strong non-liquefiable layer below the tracks.

Q. Okay. And there was also -- Mr. Rohrbach

provided testimony about whether or not the geology in this area would generate -- whether Cascadia, the subduction zone, would likely generate a magnitude 9.0 earthquake. Do you have an opinion about that?

A. Yeah, I think that everyone can agree that the Cascadia subduction zone can generate a magnitude 9 earthquake, and the geologic data indicates that.

Q. Okay. And you -- and that was your conclusion in your geotech analysis?

A. Yes.

Q. Okay. And Mr. Rohrbach testified about what the -- his expectation would be with regard to the severity of such an earthquake on the surrounding area. Do you generally concur with his conclusion?

A. Yeah, I generally concur. There's a lot of infrastructure that was built a long time ago before we had current seismic codes, before this region recognized the seismic hazards that are in this region and before seismologists understood very much about the Cascadia subduction zone earthquake. So those facilities, if they're subjected to the same earthquake that the Vancouver Energy is subjected to are going to perform much worse, I mean as a general rule.

Q. Much worse than the terminal design?

A. Yeah, the terminal is going to perform really

well because it has this really robust seismic design. A lot of the other facilities have no seismic design at all.

MR. JOHNSON: No further questions, Your Honor.

JUDGE NOBLE: Cross-examination?

CROSS-EXAMINATION

BY MS. BOYLES:

Q. Mr. Shanahan, my name is Kristen Boyles. I'm going to ask you a set of questions as well about your written testimony.

A. Okay.

Q. According to your written testimony, you drilled bore holes in specific areas around the site; is that right?

A. That's true.

Q. Did you drill any holes in Area 200?

A. Yes.

Q. Did you drill any holes in the Area 200 under the rail -- or where the rail tracks are?

A. I believe that some of them -- we actually drilled a lot of bore holes in Area 200 and I don't know which of them were under the rail tracks or not, but I'm guessing that they are in the rail -- general rail line as much as we knew it at the time.

Q. It's based on those bored drilling -- boreable drillings and other analysis that you're saying, did I catch it correctly, the tracks would settle 12 inches? Is that the --

A. Yeah, we provided a range of settlement and it was -- it was more than 12 inches, I think. I don't have the exact numbers in front of me.

Q. Let me see --

A. Significant settlements.

Q. At various places you said -- in your testimony, at paragraphs 42 and 43, you said that there was some ground motion estimated between 6 and 24 inches at various places around the site. I don't have exactly where those are, but does that sound about right?

A. Yeah.

THE WITNESS: Is my prefiled testimony in here?

MR. JOHNSON: I'm not sure. Here you go.

BY MS. BOYLES:

Q. What are "Class F soils"?

A. Class F soils, that's a soil -- site class category that's defined in the IBC code for soils that are susceptible to liquefaction. And it requires -- this all has to do with structural design and structural spectral response in developing the response spectrum.

So site Class F soils are soils that are susceptible to liquefaction, or other soils that are just really soft. And in those cases, if the structures that you're designing have a fundamental period, which is just a structural characteristic, that's greater than a half to one second, then the code requires that you complete a specific -- a site-specific site response analysis, because the liquified soils will respond differently to shaking in terms of a spectral response than non-liquefied soils.

Q. And those were the areas -- those were found in Areas 300 and 400, that's under the oil tanks and down by the marine terminal; is that correct?

A. So all of the areas of the site have soils that are susceptible to liquefaction, but in those areas -- those were the areas where we were pretty sure there were going to be structures that have fundamental periods that were greater than the cutoff there, so that would require a site response analysis.

Q. And the peak ground acceleration that you estimated and I presume gave to Mr. Rohrbach, ranged from .37 to .45, is that correct, according to your testimony at paragraph 38?

A. Yeah.

Q. Do you consider the cumulative impacts of

aftershocks or large aftershocks when you're thinking about earthquakes?

A. Yeah, we -- I don't think that they have a great impact on the design criteria that we're trying to develop, like how much settlement is there going to be and then look at that. The aftershocks generally have ground motions that are smaller than the main earthquake. Sometimes they're as big and I suppose there could be aftershocks that are larger, but they're not going to be larger than the design ground motions that we've selected.

Q. I just have a couple of questions about your written testimony, which it might help to look at. At page 12, paragraph 41, what is it -- what do you mean when you say, "The seismic design of piers and wharves is beyond the scope of the ASCE 7-10 standard"?

A. Yeah, so the ASCE 7-10, which is called out in the IBC 2012, those are for public piers and wharves.

Q. So when you say "it's beyond the scope," you mean, we just didn't apply it because this is a private --

A. I think it actually says in the standard that it's for public docks and that it doesn't -- I think it actually says in there that it doesn't apply to nonpublic wharves.

Q. I just want to make sure I understand what you did. So you did not apply that standard to the pier and wharves?

A. To the dock structure --

Q. To the dock --

(Simultaneous discussion interrupted by reporter.)

BY MS. BOYLES:

Q. So he said he didn't get any of that. So let me try again.

A. I apologize.

JUDGE NOBLE: You're talking over each other. That's the problem.

BY MS. BOYLES:

Q. Does your statement there mean that -- the design of the piers and wharves is beyond the scope of the applicable standard, does that mean you don't apply it in this situation?

A. Correct.

Q. On paragraph 46 of page 15, you indicate that there will be a response which is a collapse in the direction of maximum horizontal response. Does that mean that everything will be not flat?

A. On page 14?

Q. Page 15, paragraph 46.

A. I'm sorry, can you tell me what line that is?

Q. I may have made an error. My apologies. Let me go back. Let me withdraw that question and go back. I'll find it here in a second.

Is it correct that you estimated the lateral spreading at the shoreline of up to 12 feet before any ground improvements?

A. Yeah, that sounds correct.

MS. BOYLES: Okay. That's all I have. Thank you.

JUDGE NOBLE: Any other cross-examination of this witness?

Any redirect?

MR. JOHNSON: No, Your Honor.

JUDGE NOBLE: Council questions?

Mr. Lynch?

MR. LYNCH: Good afternoon. Thank you for your testimony.

I was just looking at the report that you prepared that was part of the attachment. I believe it's -- it's your prefiled testimony; I believe it's exhibit TSS188. And on pages 3 and 4 of that report, you're talking about groundwater and that groundwater levels in the project area fluctuate in response to seasons, precipitation, daily tidal fluctuations of the

river. Then you also indicated there are shallow perched groundwater conditions that can develop in the fill and approach the ground surface during periods of prolonged precipitation.

And I'm just curious, when you were doing your -- when you were doing a characterization of the soil for purposes of doing calculations for seismic episodes or the lateral spreading, how much did you -- did you consider very wet conditions of the soil or an average condition of the soil? Can you give me a sense of what the soil conditions were like for purposes of characterizing these?

THE WITNESS: Well, I think we -- most of the soils below a few feet deep are saturated, even if they're not submerged below the groundwater level. So they're moist or wet, but they're -- for the purpose of the seismic evaluation, we didn't assume that there was a hydrostatic groundwater level that was like higher than what it normally is for that area.

MR. LYNCH: So when you say "for what it normally is," I'm just wondering is -- normally is for August or normally is for February?

THE WITNESS: Yeah, so -- for example, we did a liquefaction analysis, and for that study we have to assume the groundwater was at some level and we

assumed that it was at elevation 12 and that's representative of the like seasonal high water. The average river level -- that's based on it being close to what the river level is. The average Columbia River level is 7 and a half over the course of a year. If you look at -- if you look at the water levels over 20 years, the highest it ever gets is -- for a sustained period is about elevation 12. That was the high average that we used.

MR. LYNCH: Thank you.

JUDGE NOBLE: Mr. Shafer?

MR. SHAFER: Mr. Shanahan, thank you very much for your testimony today.

I have one question, very general in nature, in fact, maybe even step out of the engineering specifics of this. And I just want -- I do want to cite your prefiled testimony, one short paragraph here. I'm on page 1 actually and beginning on line 23. "Since 1984, GRI has completed over 5600 projects, which includes more than 50 projects for the Port of Vancouver and hundreds of other projects for ports along the Columbia and Willamette Rivers and Pacific coast. GRI is very familiar" -- "GRI is very familiar with the subsurface, shoreline, and environmental conditions at the Port, existing Port facilities, and associated

considerations for project development design and construction."

That statement strikes me just -- again, and generally with your experience, then, is there anything that you see, given that broad experience background, that's particular to this site or project proposal that -- I mean, does all of that seem fairly typical, usual, or is there anything specific to this proposal that you think is extraordinary or unusual in contrast of the many other project experiences that you've had?

THE WITNESS: I think it's a pretty typical project. It's an industrial project at an industrial site. Its scale is bigger than a lot of the projects that we work on. It's bigger than a lot of other similar types of projects. But in terms of the -- you know, the problems you're trying to figure out and solve, it has similar types of problems.

MR. SHAFER: Okay. So you're not seeing anything relative to this project that you think requires, you know, additional security or, you know, additional concerns to be addressed or nothing highly unusual, other than, of course, the magnitude of the tanks and such, but the general parameters seem relative to --

THE WITNESS: All of the projects that we've

worked on that are -- whether they're as big as this or as small as this, we always work toward a performance criteria so that a project can perform statically and seismically. So we have brought that to large projects like this one, whether it's oil or logs, you know. We have to meet the performance criteria and so we approach them similarly in that way. Sometimes you have to go through different steps or more steps for a real large project than a smaller project, but I think this is all similar to the types of work that we've done, yeah, particularly at ports and for heavy industrial projects.

MR. SHAFER: All right. Thank you.

JUDGE NOBLE: Mr. Siemann?

MR. SIEMANN: Thank you for being here today.

So I'm struck by the potential settlement of ground going from 6 to 24 inches in a design event, as you testified and as noted in your prefiled testimony. And I poked at this question a lot, of the railroad tracks. So let me try it a different way here. If a new rail track were to be proposed for this site, would you recommend that it be reinforced seismically?

THE WITNESS: No.

MR. SIEMANN: And why not?

THE WITNESS: Not unless someone told me

that this rail can't -- if they gave me a performance criteria that says, this rail can't -- keep in mind, Matt, this rail can't settle more than two inches, or this rail can't settle more than four inches; then I would do my analysis and conclude that we were going to have to exceed that criteria and we would have to come up with another way to reinforce that rail. So my understanding is that the rail can tolerate large settlements and it won't damage the tracks or the ties or the trains.

MR. SIEMANN: So let me ask you, then, have you been given a design criteria for the tracks and its settlement -- its ability to withstand settlement?

THE WITNESS: No.

MR. SIEMANN: So you don't actually know how much tracks can settle before they fail?

THE WITNESS: That's true. We provide design criteria to the people that design the foundations and support systems for the tracks. So they know whether, you know, their system is going to work or not. So we tell them how much the seismic settlement is so they can use that information as they design the track.

MR. SIEMANN: Okay. This is still a concern for me.

JUDGE NOBLE: Mr. Rossman?

MR. ROSSMAN: Thank you for your testimony.

I want to turn to some questions that I was asking the previous witness about the return period and code versus likelihood of exceedance. But first, I want to ask if your perspective is the same as the previous witness, that the 2015 IBC which Washington has adopted as of July 1st, tomorrow, does that materially affect any of the standards of what earthquake this should be designed to?

THE WITNESS: I don't know what is going to be in the 2015 -- 2015 IBC. The only thing I've seen is some information from the USGS database, which gets upgraded sort of along the way, along with the IBC, and it doesn't appear that the ground motions in the database have changed materially in that code cycle, but I don't know what changes would come out of the twenty -- what I thought was -- yeah, the 2016.

MR. ROSSMAN: Okay. So turning to the last paragraph of your prefiled testimony, which is on that last page, I understand that we're talking about an earthquake that has a 2 percent probability of exceedance in 50 years; is that right?

THE WITNESS: Yes.

MR. ROSSMAN: That's the design earthquake.

And I believe that the sentence that starts on line 2 of that page, that refers to the ground motion associated with probabilistic maximum considered earthquake represents a targeted risk level of 1 percent in 50 years probability of collapse. So is that saying that, in your opinion, the odds are that there's a -- what does that mean in lay terms?

THE WITNESS: Yeah. So in lay terms, that 1 percent in 50 years is a code-based risk evaluation of a structural collapse, and it isn't a probability that's associated with an earthquake. The earthquake is 2 percent in 50 years. But in developing the code for structurals -- and this was something that's probably done by structural engineers who would be able to answer this better than me -- but there's a 1 percent in 50-year probability of structural collapse if you meet this code. You know, I'm not -- it's not an earthquake ground motion return period, if that's your question.

MR. ROSSMAN: It is. But the earthquake designed for is an earthquake that would still leave a 1 percent risk of collapse if -- if that -- I'm not quite sure how to phrase this.

Let me turn just to the rate of return of the earthquake and the probability of an earthquake that would exceed the design criteria. So I understand

correctly that it's designed to the probability of an earthquake that at this site would occur approximately once every 2475 years, or there's a 2 percent chance of that earthquake occurring at this site within the next 50 years.

THE WITNESS: Right.

MR. ROSSMAN: The previous witness I believe effectively testified that that was approximately the maximum earthquake that he could conceive geologically happen at this site, or something -- that is what I took from his testimony. Can you conceive of a larger earthquake happening at this site?

THE WITNESS: So I can, yeah. If you look at lower probabilities if something happened -- of something occurring, you can come up with different parameters. So if you -- where the USGS and you went through all their probabilistic analysis for half a percent probability of exceedance in 50 years, it would result in a larger ground motion design.

MR. ROSSMAN: I guess what I'm fundamentally trying to get at, is what are the odds that an earthquake that will cause significant structural damage or collapse will occur within the life of the project, which I think of as about 20 years, and I think that the answer to that question is based on that 1 percent in

50-year probability. And so if I were to essentially scale that down to 20 years, I would get a four-tenths of 1 percent probability of an earthquake occurring that would cause collapse. Is that logic --

THE WITNESS: I think that that is the intent of the code. This sentence is right out of the code, and I think that's the intent of the code, that it just has a 1 percent in 50-year probability of collapse in the direction of maximum horizontal response.

MR. ROSSMAN: And that's the intent of the code and the -- your motion design is based on the code specification and the further engineering was based on making sure that the ground improvements would hold movement to that level based on that code earthquake?

THE WITNESS: Correct.

MR. ROSSMAN: Okay. Thank you.

JUDGE NOBLE: Are there any other council questions?

MR. MOSS: Yes.

JUDGE NOBLE: Mr. Moss?

MR. MOSS: Mr. Shanahan, I want to take you back to this line of questioning that we -- a council member was presenting earlier about the area where there are not going to be any ground fixes or ground improvements, or whatever the right terminology is, and

that's specifically the rail -- area where the railroad tracks loop is going to be. You remember that, talking about that a few minutes ago?

THE WITNESS: Uh-huh.

MR. MOSS: And I think I understood you to say that were there to be an earthquake that led to liquefaction in the soils down in the 12-foot level or 15-foot level, or whatever it is, that could cause or perhaps would cause the ground above to settle?

THE WITNESS: That's correct.

MR. MOSS: Now, would it settle uniformly over the entire area, or would it perhaps settle a foot here and an inch here? What sort of scenario are we looking at there?

THE WITNESS: I think that it would not settle uniformly the same amount everywhere. There would be variations in the amount of settlement.

MR. MOSS: All right. So let's assume perhaps a second here that it subsides a foot here -- or settles a foot here and six inches over here. I know you're not an engineer, or a railroad engineer at least, but what do you think that would do to a railroad track?

THE WITNESS: Well, it would damage -- it would probably damage the railroad track.

MR. MOSS: Probably would. And if there's a

train sitting on that track, do you think it might have some effect on the train?

THE WITNESS: It would make the train tilt whatever the amount of that differential settlement is.

MR. MOSS: So what I -- the fundamental question I wanted to get back to you with is, who told you that it's okay for that to happen? You said if you would be given some criteria, you can -- your job is to say, here's what might happen, and if somebody gives you criteria that says, well, we can't allow that to happen, we can only allow for two inches of settlement, for example, underneath the tanks, then you can participate in the endeavor to design the improvements that will lead to that safer situation.

Now, it seemed to me that you were saying nobody told you that 12 inches of settlement in that area was not unacceptable, or to put it the other way, somebody told you that 12 inches is okay. I'm curious about how that works. You work as part of a team here. So who decides that 12 inches of settlement in that area is acceptable?

THE WITNESS: Whoever designs the rails.

MR. MOSS: So --

THE WITNESS: I'm just saying that to me, 12 inches of settlement and even differentially for a

rail, doesn't seem like a lot, or that it would damage a rail car. I mean, it would damage a track, it might require some repair, but it doesn't strike me as something that is going to cause a rail car to rupture or a catastrophic failure in a 2500-year earthquake event. If that's the worse that happened, you know, we would be in pretty good shape.

I'm not trying to make light of your question. I just don't really understand what you're getting at. We provided the criteria of what we think will happen in that area, and the people that actually designed the facility determined that that's okay for their operation of their rail and their car.

MR. MOSS: That is exactly what I'm trying to get at. So you have captured precisely what I'm trying to get at. Somebody decided it's okay for that to happen in that area.

THE WITNESS: Yeah, I think so.

MR. MOSS: Right. And so maybe we'll have to have some further inquiry of another witness or something to find out what the consequences of that sort of event might be for a unit train sitting on the tracks and so forth. That wouldn't be your area of expertise. I understand. I'm not asking you about that. I'm just saying -- trying to explain to you the point of my

question. What I'm trying to get at is, what happens if that settles like that. That's all. Thank you very much. I really appreciate your help on that.

THE WITNESS: Okay. Yeah.

JUDGE NOBLE: Are there any other council questions?

Are there any questions based upon council questions?

MS. BOYLES: Just one.

RECROSS-EXAMINATION

BY MS. BOYLES:

Q. Under the code, what is generally considered the life of a project like this?

A. I don't know what the code considers the life of the --

Q. What is generally the life of the -- Mr. Rossman was talking about the life of this project as 20 years. I just want to know if that's the period you considered as well?

A. I usually think of a project as more like a 50-year project, but -- you know, most of the --

Q. That's okay.

A. -- ones around me have been around for longer than 50 years, so I tend to take a longer view on things like that, I guess.

MS. BOYLES: Thank you.

JUDGE NOBLE: Any other questions?

MR. JOHNSON: I'm sorry, I do, Your Honor. And actually it's just one, but I need to pull an exhibit up. So we have Ms. Mastro working on that right now.

REDIRECT EXAMINATION

BY MR. JOHNSON:

Q. Do you recognize what report this is from, Mr. Shanahan?

A. Yeah, that looks like the GRI -- geotechnical report for the upland.

Q. Okay. And I'm going to draw your attention to the second paragraph from the bottom where it says "Area 200." Do you see that?

MS. MASTRO: Sorry.

MR. JOHNSON: That's okay. It's great if you can blow it up. There we go.

BY MR. JOHNSON:

Q. Okay. Can you take a minute and read that, please.

MS. MASTRO: There you go.

A. The general section?

BY MR. JOHNSON:

Q. Yes.

A. "As previously mentioned, the site layout for the rail unloading area, administrative and support structures and west boiler are shown in Figure 3. It is our understanding the unloader structure, boiler structure, trenches, office, changing rooms, control room and fire pump and foam structure, and transfer pads will be lightly loaded. As discussed in the seismic considerations of this report, we estimate 10 to 16 inches of liquefaction-induced settlement in Areas 200 and 600 during a design seismic event."

Q. That's fine. You don't need to read the whole thing. I don't mean to cut you off, but if you -- I want you to focus on "the estimate of 10 to 16 inches of liquefaction-induced settlement."

Does that refresh your memory as to what your conclusion was with regard to possible settlement in Area 200?

A. Yeah, looks like we're saying it's 10 to 16 inches.

Q. Okay. Now I would like you to look at the next paragraph, please. And you don't have to read it. I just draw your attention to your discussion of foundation -- well, I'm phrasing that question as though you're the author. Were you the author of the report?

A. Yeah.

Q. Okay. And you said -- you say, "Spread footings for Area" -- in this case -- "200 can be designed using the criteria summarized" -- et cetera. And then you say, "Liquefaction-induced settlement of structures founded on spread footings is estimated to be the same as noted in the previous paragraph. Seismic settlement of structures can be reduced to less than 1 inch by using driven pipe pile foundations."

Now, you may or may not know the answer to my next question, but do you know if the design includes driven pipe pile foundations for the rail tracks in Area 200?

A. I don't know. As far as I know, not underneath the tracks.

Q. Okay. But you -- you have concluded that by using driven piles, you could reduce that 10 to 16 inches of settlement to less than 1 inch; is that right?

A. If you pile pounded the railroad tracks, that's correct.

MR. JOHNSON: Okay. Thank you. Nothing further, Your Honor.

JUDGE NOBLE: Are there any other questions? I think -- I don't see any, and I think that's where we are.

Thank you very much, Mr. Shanahan, for your testimony. You are excused as a witness.

THE WITNESS: Thank you.

JUDGE NOBLE: We're ready to just talk briefly about what can be expected on Tuesday morning. I know, Mr. Johnson, we didn't get through all of your witnesses today, but we got about three-quarters of the way.

While you're looking at that, Ms. Reid, I just want to remind you to get us a list of the City's -- just exhibit numbers for the ones that are at the end of the testimony. So would you bring that if you could on Tuesday?

MS. REED: Yes, Your Honor. I do have the list of the prefiled testimony, but I will also bring a list of any additional exhibits that we withdraw objections to.

JUDGE NOBLE: Oh, good. Thank you. That would be good. One thing that might speed us up possibly, and you're maybe already doing this with Ms. Mastro, if you know the exhibits that will be associated with the witnesses that are upcoming, that would be great to get a list of those. That would help the council also so they could review those exhibits before the testimony. Just because you probably don't

have enough to do.

MR. JOHNSON: Well, we've been trying to do that for -- we've been trying to do that for Tammy, so it's not really an additional task.

JUDGE NOBLE: If you don't mind, if you just want to give it to me or to one of the staff, that would be fine. I'll just pass it along to council members.

And to let you know that we're going to be back on the record at 9:00 and probably -- our usual practice has been to have 15 minutes before that without the council just to take care of housekeeping matters that -- so then they will gather and then we'll start on the record at 9:00 on Tuesday morning in Olympia at the Red Lion Hotel, and anyone in the public who wishes to know the details about that can call EFSEC's office or check on the website. I think the address might be on the website.

So for Tuesday --

MR. JOHNSON: All right. For Tuesday, Your Honor, I intend to call Kelly Thomas of BakerRisk who filed prefiled testimony. The general subject matter will be facility risk issues and be rebuttal primarily of Peterson and Harvey. I'm sorry. I'm not using first names for everyone here.

We will then call David Sawicki -- actually,

the Port intends to call David Sawicki. Now, Mr. Sawicki filed prefiled testimony in this matter, and the general subject matter is emergency response planning and site safety.

The applicant would then propose to call Dennis O'Mara, also filed prefiled testimony. General subject matter is transloading and vessel risks. And Mr. O'Mara will be primarily rebutting Ms. Harvey, among some others, but primarily Ms. Harvey. That's what we're looking for for Tuesday.

JUDGE NOBLE: And we do not have witness Haugstad today. Do you still plan on calling him?

MR. JOHNSON: We will not be calling him on Tuesday, Your Honor, just because of witness availability issues. We're having to do some juggling.

JUDGE NOBLE: That's fine. I just wanted to check. Thank you very much for that, and thank you all for your courtesies this week. It's been a busy week with a lot of work and everyone has worked together. Thank you very much for doing that. We are adjourned until Tuesday morning at 9:00 in Olympia.

(Hearing adjourned at 5:06 p.m.)

C E R T I F I C A T E

STATE OF WASHINGTON)
) SS.
COUNTY OF CLARK)

I, Micheal A. Johnson, Registered Diplomate Reporter and Certified Realtime Reporter, do hereby certify that the foregoing transcript is true and accurate to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 13th day of July, 2016.

MICHEAL A. JOHNSON, RDR, CRR