POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON

NATIONAL PARKS CONSERVATION ASSOCIATION, Appellants,	)	
vs.	)	PCHB No. 17-055
STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, and BP WEST COAST PRODUCTS, LLC, Respondents.	)	

HEARING, VOLUME IV

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Tumwater, Washington

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BE IT REMEMBERED that on Thursday, April 26, 2018, at 1111 Israel Road S.W., Tumwater, Washington, at 9:00 a.m., before KIM L. OTIS, CCR, the following proceedings were had, to wit:

<<<<<< >>>>>>

MR. WISE: Ms. Cox, do you want to continue with your witness.

MS. COX: We have Eric Hansen continuing this morning for us.

ERIC HANSEN, having been previously duly sworn by the Certified Court Reporter, resumed the stand and further testified as follows:

DIRECT EXAMINATION (Continuing)

BY MS. COX:

Q Good morning, Mr. Hansen.

A Good morning.

Q So we were running through issues very quickly yesterday at the end of a long day and I'd liked to briefly recap the bottom line of what we covered.

MS. SHIREY: Before you start, could I

just ask to make sure that the witness is still under oath.

MR. WISE: We are assuming he is still under oath, yes.

MS. COX: Thank you.

Q (By Ms. Cox): Can you please remind the board of the two main points of disagreement between BP and NPCA regarding issue 1 of the AQRV analysis.

A I believe the two primary issues are whether the visibility analysis should consider getting emission units that don't have an increase on the maximum 24-hour emissions as a result of the project, and for the deposition analysis, whether the emissions from affected units should be based on their potential emissions after the project.

Q And we covered visibility analysis yesterday afternoon. Can you please summarize how FLAG directs you to calculate visibility impacts analyses.

A I cited several excerpts and read several excerpts from FLAG that direct us to use the maximum 24-hour emissions for evaluating visibility.

Q In this case, did the National Park Service calculate visibility-related impacts in a manner consistent with FLAG?

A No. The Park Service evaluated annual emissions before

and after the project that, in my opinion, is inconsistent with FLAG because they're supposed to do it based on 24-hour values. And it's an interesting scientific evaluation but not consistent with how applicants are expected to do their AQRV analyses for the PSD process. I think Kyle Heitkamp pointed out several very significant errors in the annual emissions as well.

Q How did BP calculate visibility impacts here?

A BP calculated them based on the maximum increase in 24-hour emissions attributable to coker heaters. The coker heaters are the only emission units that experience an increase in maximum 24-hour emissions.

Q Do you believe this approach was consistent with FLAG?

A Yes.

Q Switching gears, how does FLAG require a deposition impacts analysis to be performed?

A FLAG doesn't specify carefully how it's done, but it does specify that it's an annual issue that we are trying to evaluate how much nitrogen and sulfur is deposited in Class I areas on an annual basis and then we compare the model-predicted value with a deposition analysis threshold that is an indicator of significance.

Q Yesterday you discussed that there are new, modified and affected units. Can you remind us briefly of the

distinction between those types of units.

A I think I said -- I'm sure I said new is fairly obvious, it could only be the new coker heaters that are appropriate in this project. Modified units are those that experience a physical change or a change in the method of operation that increases emissions. It's a very precise definition. There are no modified units associated with the project. And then affected units are those downstream or sometimes upstream units that experience an increase in utilization as a result of the project, but there is no physical change or change in the method of operation.

Q And how does FLAG define affected versus modified units?

A FLAG does not define those terms. It only uses the words affected units once in one sentence in the whole document.

Q Which emission units did BP analyze to calculate that annual emissions increases for deposition from this project?

A BP analyzed all the emission units that experienced an increase in annual emissions as a result of the project. That would include the coker heaters and the affected units.

Q And how does FLAG direct you to calculate the annual emissions increases from new, modified and affected

units?

A There are enough references that we're fairly certain that we evaluate the increases from new units and modified units based on their potential to emit, so that's how the coker heaters were evaluated. It doesn't give any guidance whatsoever for affected units.

Q In his live testimony, how did Mr. Gebhart suggest to deal with the distinction between modified versus affected units in the absence of direction in FLAG?

A Mr. Gebhart suggested in his testimony and in his deposition that there shouldn't be any distinction between affected units and modified units; that they should be treated the same if there's an increase in emissions.

Q And do you agree with this approach?

A I certainly don't.

Q Can you please turn to paragraph 50 in Mr. Gebhart's direct testimony and please read the first sentence of this paragraph for us.

A He writes, "For deposition modeling, there is no specific discussion of the emission rate inputs in FLAG as there is for visibility AQRV modeling."

Q So how does Mr. Gebhart suggest calculating deposition-related impacts in the absence of guidance in FLAG?

A Well, he encourages -- he believes that it should be

based on the maximum potential annual emissions.

Q And how did BP calculate the annual emissions increases in the November supplement for deposition?

A For the coker heaters, which are the new units, it was based on the allowable emissions that were proposed in the application and they subtracted the baseline emissions as recommended by the National Park Service.

For the affected units, it was based on the projected actual emissions minus the 2014-2015 baseline as directed by Ecology's PSD manual.

Q And what were the results of the deposition impacts analysis?

A The predictions showed the deposition in all Class I areas would be less than the deposition analysis threshold.

Q And what is your perspective on Mr. Gebhart's suggestion that BP use maximum allowable emissions or potential emissions for all emission units in calculating deposition impacts?

A Well, I understand that it is appropriate for new and modified units, I agree with him there, but for affected units, that's a ludicrous concept. And I can give you an example that I hope makes it easier.

If there is an affected unit at the refinery that currently operates at, say, 5,000 gallons per year, but

it could operate at 10,000 gallons a year, that's its potential design, say, so if the project, this project, allows it to increase from 5,000 to 6,000 gallons per year, I think of that as its potential after the project, that's the affect on the project, that incremental value, and that's what BP analyzed in the application. What Mr. Gebhart is suggesting is that the maximum potential of that unit should be evaluated, in other words, the 10,000 gallons a year, that is its potential emissions, but it's not characteristic, it's not indicative of what the effect of the project was, and that's what PSD is all about is evaluating a project.

Q In your opinion, is the approach taken by BP to evaluate deposition-related impact consistent with FLAG?

A Yes, it is.

Q Switching gears a little bit, BP's AQRV analysis determined that the project will have no significant adverse impacts to visibility and deposition in Class I areas; is that correct?

A Yes.

Q And the Park Service believes that the existing refinery is impairing visibility in Class I areas, correct?

A Yes.

Q What, in your opinion, is the appropriate regulatory

program to address the refinery-wide existing impacts on visibility?

A The Clean Air Act established and EPA has implemented a program called the regional haze rule, and the regional haze rule considers all the sources of pollution that affect visibility in Class I areas. It prescribes certain rules and requirements for states to implement new plans that will address visibility toward a goal of no human impact or restoration of pristine visibility by 2064. And there are a series of steps in there that include basically a glide path, various check-off points, the first being 2018. The regional haze rule is more appropriate because it considers all the factors that affect regional haze, the visibility, not just the project.

Q And the PSD program is distinct from this in what respect?

A It only evaluates a single project.

Q Are you aware of any instances where the Park Service has acknowledged that the regional haze program is the appropriate mechanism to address refinery-wide visibility impacts?

A Yes. There was a recent similar situation with the Tesoro Refinery in Anacortes.

Q Can you please turn to Exhibit R-53.

A In which binder?
Q The one to your left, yes. Can you please explain what this letter is first.
A It's a comment letter from Department of Interior to Gary Huitsing at Ecology that describes a modeling analysis that the Park Service did that's similar to the modeling evaluation they did at the BP refinery. And it says how important visibility is, that it's an important value for the Park Service. And it goes on to describe a modeling analysis of the Anacortes refinery emissions and the fact that they show that there is visibility impairment in the Olympic National Park and deposition issues as well.
Q And can you please tell us what the date of the letter is for the record.
A April 26, 2017.
Q Which was after the Park Service commented on BP's coker heater project AQRV analysis?
A Yes.
Q And I would love for you to read the second-to-the-last paragraph on page 5.
A It sort of a closing summary of the document. It says, "We understand that for this modification" -- in other words, the project at Tesoro -- "the only PSD-applicable pollutants are particulate in greenhouse gasses. The

above modeling was done based on the current 2014-2015 annual emissions from the entire facility. The visibility comments provided here do not apply to the currently proposed modification. However, given the significant visibility impacts of the entire Tesoro facility on the North Cascades and Olympic National Parks, we request that the Tesoro Refinery should be considered for additional controls during the next reasonable progress phase of the regional haze rule. The most significant contributor to visibility impacts is NOx and for this reason, we would also like to commend Tesoro and the Northwest Clean Air Agency on the addition of SCR, the new boiler and the permit limit of 9 ppm."

Q So in this case, the Park Service calculated AQRV impacts analysis on an annual basis, or annual emissions, excuse me, as they did in BP's case?

A Yes.

Q But they reached different conclusions on how to address those visibility-related impacts?

A Yes. In this last paragraph, they say we did the analysis, there is an impact, but essentially we're not holding this project accountable for the impacts, and they say that they want Ecology to evaluate this issue in the next regional haze rule update of the state's

program.

Q Do you agree with the Park Service's approach in this recent Tesoro permit?

A Yes, I do.

Q And, finally, in your opinion, do you believe BP and Ecology properly evaluated impacts to AQRVs for this project?

A Yes.

Q And what did the results of the AQRV analysis for the project show?

A That Visibility impacts in all national parks in Class I areas would be less than the perceptible visibility impact criteria and that deposition impacts would be less than the threshold value of concern.

Q Do you think Mr. Gebhart's claims here regarding the shortcomings of the AQRV analysis have any merit?

A No, I don't.

Q Thank you. No further questions.

MR. WISE: Thank you. Ms. Brimmer, cross?

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

MS. COX: Can I move for admission of Mr. Hansen's direct expert testimony and his CV, please.

MR. WISE: What exhibit -- is the CV

part of his direct or --

MS. COX: It's part of it, yes, it's an attachment to it.

MR. WISE: Any objections?

MS. BRIMMER: No objection.

MS. COX: And I also forgot to move to admit Exhibit 53 and Exhibit 33.

MR. WISE: So R-53 and 33?

MS. COX: Yes.

MR. WISE: Any objections to those, Ms. Brimmer?

MS. BRIMMER: No objection.

MR. WISE: Okay. So the direct testimony, including the CV, and R-33 and 53 are admitted.

(R-33 & R-53 admitted.)

CROSS EXAMINATION

By MS. BRIMMER:

Q Good morning, Mr. Hansen.

A Good morning, Ms. Brimmer.

Q I just want to confirm that the AQRV modeling done by the Park Service shows that visibility was dominated primarily by nitrates which come from nitrogen oxides, right?

A I don't recall if it was dominated by nitrates.
Q Okay. Also I want to confirm when we are talking about deposition impacts, we're talking about two separate components, in other words, nitrogen deposition and sulfur deposition, right?
A That's correct.
Q And each of those are assessed in AQRV modeling?
A Yes, they are.
Q Now, on page 7, paragraph 19, of your testimony, if you have that in front of you.
A I'm at paragraph 19.
Q I just want to confirm, this is not an incrimate case, in other words, it is not about consumption or violation of an incrimate; that's a different consideration than PSD and that's not at issue in this case, right?
A Yes.
Q I also want to confirm your written and oral direct, that you distinguish between affected and modified units, I think that's been made clear.
A Many times, yes.
Q And that you turn to the PSD applicability rules for defining those terms; is that right?
A In the absence of any definitions in FLAG, yes, we do. We turn to, I would say, new source review rules in general.

Q Okay. And to be clear, when we are talking about PSD applicability, that means the calculations and modeling under federal rules for determining whether a source is a major modification with significant increases in emissions that would be subject to PSD permitting, right?
A Yes.
Q In other words, you're just trying to figure out whether they have to get a PSD permit, right?
A That's correct.
Q And it's after that, that the AQRV requirements in the Clean Air Act that kick in, right?
A That's correct.
Q And here it was determined that the coker heater project was subject to PSD permitting; that's this permit, right?
A Yes.
Q And I think that you have testified that Mr. Gebhart effectively is in agreement with the way the Park Service did the modeling in this case, right?
A Yes, he endorsed it.
Q One of the problems you see with that is there is no distinction like the one you make between affected and modified sources being included in the modeling, right?
A It's okay if affected units are included in the modeling

if there's an increase in emissions, and so I don't have a dispute about whether they should be included in the deposition modeling, that was fine, but they should not have included the affected units in the 24-hour visibility modeling.

Q And you're saying that's because there is a distinction in the definition between modified and affected for visibility modeling?

A No, no, I'm saying it's because the visibility analyses, we're directed to evaluate visibility analyses based on 24-hour emissions, not annual, so it's fine that they include them for the annual emissions because there is an increase in annual emissions from affected units.

Q Okay. So just to be clear, you've reviewed BP's modeling and you've confirmed that they did not -- it's not that they modeled no short-term emission increase from affected units, it's that they didn't model them in the first instance because BP determined they wouldn't have an emissions increase; is that correct?

A You're going to have to break that one up for me. I wasn't quite sure who "they" was.

Q Sure. Fair enough. I started with BP so if I say "they," I'm talking about BP.

A I want to make sure.

Q That will keep me honest, all right. So I want to just

be clear on what actually happened, and I'm referring to the short-term visibility modeling, okay. So am I correct in understanding that BP did not even model the affected units for short-term visibility effects?

A That's correct.

Q And they didn't even model those because they determined before that, that BP did not believe that there were going to be short-term emission increases from affected units?

A That's correct.

Q And the way BP got there --

A Let me correct that. There are no increases in emissions from the affected units that are greater than they are today.

Q And the way that EPA got to that conclusion and, therefore, omitted them from modelling is that BP took the maximum day before the project, compared it to the expected maximum day after the project for the affected units, and determined that's not going to be any change; right?

A That's correct, there is no increase in coker output so there is no way that the coker project can affect maximum short-term emissions that are required for evaluation of visibility.

Q So let's talk about the days before the project, okay?

A Sure.
Q So you looked at the affected units and you said, okay, so here is the maximum day for this unit, here is the maximum day for that unit pre-project, right?
A BP did, yes.
Q BP, sorry, yes. And you agree with that as the first step, right?
A Yes, what can the unit do today.
Q Okay. And you compared just that highest day with the highest day expected afterwards; what can that unit do after the project?
A That's correct, what's the difference.
Q So let's go back to before the project. There are a lot of days those units are operating, right?
A Yes.
Q Some of those days the units might not be operating or be operating at a reduced capacity or utilization because of the downtime we've talked about of the coker units, right?
A Well, yes, they would be -- they might be operating at a lower rate, they're certainly still operating at a higher rate, but not necessarily half, but, yes, they are probably operating lower, or they could be.
Q And those what we are calling the affected units, they don't have a uniform operation throughout, right?

A I wouldn't think so, no.
Q So it goes up and down on a day-to-day basis, right?
A Yes.
Q So after the project, I understand that BP's position is the highest day, that highest one day is going to stay the same after the project, right?
A That's right.
Q But the days that are just under that highest day, they're still not going to be at a uniform level, they're going to vary as well, right?
A That's right.
Q And so it is possible, isn't it, that you might have, for example, more days that just come up to and touch that maximum after the project?
A Yes, on an annual average, affected units will see an increase in their operation.
Q I didn't ask on an annual average. I'm saying there will be days where they come up closer to that maximum than they did before.
A There will be an increase on some days, yes.
Q And there might be days where just overall it's bumped up from what might have been medium; there might be more days that were above medium level of utilization, right?
A Could be, yes.
Q But we didn't put any of that into the model because we

determined that the max day pre and the max day post would be the same, right?

A That's correct.

Q Visibility is assessed daily, I think that was your testimony, and you emphasize that that was important, correct?

A It is, yes.

Q And that's because visibility has various components that the federal land managers care about, right?

A Yes.

Q One of those is frequency; how often is the air in the national parks obscured, right?

A Yes.

Q And some of that is intensity; how badly is it obscured, because it's not a uniform level, right?

A Yes, and that's what we focused on in the analysis first is we focused on the intensity, what change in extinction is there.

Q Okay. And then there's duration; how long is that going to last; is it a few hours, is it a week, right?

A That's correct.

Q And one of the things that the Park Service told BP is that frequency component is important and the frequency, according to the Park Service, is going to change, it's going to worsen, right?

A Frequency of what?
Q Frequency that there is a visibility effect in the two parks.
A That's what the Park Service said. With visibility, in fact, the real question is whether there's a perceptible effect. That's the key in our quality related values analysis is the effect.
Q Let me interrupt you, if I could, because I would absolutely love to ask you some questions about that.

So the Park Service uses a measure for determining when visibility is impaired and that's that .5 deciviews, right?
A Yes.
Q And they use that because it has been stated that that's what a human can perceive, that anything finer than that is not perceptible, but .5 is perceptible, right?
A That's the threshold of perception that they identify, yes.
Q That's right. So when the Park Service says there are going to be more days -- when they reach the conclusion there will be more days in Olympic National Park that the visibility will be obscured, they're putting that against that .5 deciviews, right?
A Yes.
Q So is it your understanding BP became aware of the Park

Service's modeling and the Park Service's concerns in the summer of 2016?

A Yes. I honestly don't recall the month, but I think it was soon after the June application was submitted.

Q And it was at that point in time that the disagreement about including affected units in the modeling came to light, correct?

A Yes.

Q But BP never changed the modeling to conform to what the Park Service's interpretation would be of including the affected units in the visibility modeling, right?

A That's correct.

Q Do you know if those affected units had been included in BP's modeling, that it would have generated similar results to what the Park Service got?

A I don't know. I don't believe BP ever did that modeling.

Q So you disagree on the Park Service's reading and application of its own FLAG guidance; is that your testimony here today?

A I think the Park Service is free to do whatever analysis they want. I don't think the analysis that they did complied with FLAG guidance that's used in PSD permitting.

Q So just to be clear, that statement means you disagree

with the Park Service's reading and application of its own guidance; is that right?

A As they applied it right here, yes.

Q Do you think the Park Service was confused on how to apply its own guidance?

A I believe that the Park Service was on a mission and they wanted to present -- I think they were making a case for additional emission controls at BP and that they were providing a scientific analysis that supported their position, not trying to duplicate the procedure that applicants followed in PSD permitting.

Q To be fair, that could be said about BP, too, right; they want to do the project, they don't want to put SCR controls on.

A They want to do the project, certainly, and they found that the SCR was not cost effective.

Q Right. Despite what the Park Service was discussing, BP has very firmly said we don't want to do SCR, right?

A That's correct.

Q I would like you to refer to page 9, paragraph 26, of your testimony, please. I just want to be sure that I understand your testimony. A lack of physical change to a unit is not conclusive of whether there will be a change in emissions at that unit from the project, right?

A That's correct.
Q And, in fact, I think at page 12 of your testimony, lines 25 and 26, you do note that average daily utilization and emissions may increase, including at affected units, right?
A Yes.
Q And that those short-term emissions at affected units could change in their frequency or their duration or their intensity, right?
A Would you repeat that.
Q Sure. I will break it up. Maybe that's easier.
A Okay.
Q Short-term emissions at those affected units, day-to-day, we were discussing earlier, could change in their frequency, right?
A Daily emissions can change, yes, they will change.
Q In other words, from pre-project. Let me give you that frame of reference.
A Daily emissions will change. There would be an increase in utilization.
Q Okay. And those changes could be, and I think that they might achieve a certain level of emissions more frequently, for example?
A Yes.
Q Or the duration of a certain level of emissions might

change, correct?
A Yes.
Q Or the intensity, in other words, how high those emissions go could change?
A Well, same thing; they could be higher on any given day.
Q Right, but they won't exceed that single daily max that you looked at.
A That's correct.
Q I would like you to turn to Joint Exhibit 11, that's the FLAG guidance that we've been spending lots of quality time with, page 24 in particular, and I think that's JE Bates number 1147. I think I have that memorized. And I think that Ms. Cox had you read part of or most of a paragraph on that page yesterday. Do you recall that paragraph?
A I don't recall -- I think I read several.
Q Okay. Well, let me take a look at my copy and then I can get you right there. So if you look on page JE1147, look at the right-hand column, the paragraph in the middle of the page that begins "Applicants," you remember reading that yesterday, right?
A Yes.
Q There is actually a footnote attached to that, isn't there?
A Yes.

Q And that footnote is Footnote 6, right?
A Yes.
Q And that includes a caution about modeling, right?
A Yes, it appears to.
Q And then I would ask you to turn to P-7. That's in the exhibit book that is the NPCA exhibits, it's one of the green ones. Let's go to the second page of that. I think you discussed that with Ms. Cox yesterday as well, right?
A I did.
Q And I think your testimony was you had not had occasion in the past to look at the response to comments; is that right?
A That's correct.
Q And I would ask you to refer to the paragraph at the bottom of that page, and take some time to read that, I don't need you to read it out loud, but just take a moment to review that, please.
A Okay. I've read it.
Q Thank you. Would you agree with me that that is further explanation or additional explanation for what the FLMs are discussing in Footnote 6 of FLAG? And you can take your time to compare those as necessary.
A Yes.
Q And I think on P-7, would you agree with me that the

federal land managers are noting that there can be short-term emissions increases at units that are not physically modified, right?

A I think so, yes.

Q And they're saying basically they want to know what those are, right?

A What I take from this paragraph is that the applicants should calculate the baseline as suggested by the Park Service in their comments after the 2016 application was submitted, that's what I derive, that's all I derive from this.

Q Okay. Let's explore that. So the baseline would be actual emissions before the project, right?

A Yes.

Q But BP here never looked at actual emissions as described in P-7 for the affected units before the project, never subtracted those actual emissions from the expected emissions for the affected units post-project, right; they never did that for the visibility modeling?

A No, because there wouldn't an increase in emissions.

Q I'd like to turn to some of your testimony about regional haze and the regional haze program. The PSD requirements for AQRVs and the federal land managers' role that we're discussing in this case is the PSD

section of the Clean Air Act, right, it's the PSD requirements?

A Yes.

Q And the haze requirements and the federal land managers' role in haze is an entirely separate section of the Clean Air Act, right?

A Yes, that's correct.

Q That's got its own program and its own set of rules from the PSD program and rules, right?

A Yes.

Q And there's nowhere in the Clean Air Act that suggests one substitutes for the other, correct?

A Not that I know of, no.

Q And there's nowhere in the permitting rules that suggests one substitutes for the others, correct?

A Correct, not that I know of.

Q So with that, let's turn just quickly to your testimony about the Tesoro exhibit and the Tesoro example. And I think you referenced this in your direct testimony. Tesoro had already agreed to apply SCR, correct?

A Yes.

Q And, in fact, Tesoro had also, I think, noted in the letter there were going to be significant emissions reductions in VOCs, or volatile organic compounds, correct?

A I believe that was correct.
Q And that's a pretty significant environmental benefit as well, isn't it?
A Yes, it is.
Q And that would be different than the situation here, right? In other words, Tesoro's agreement to apply SCR is different from what BP's position on SCR is in this case, right?
A On SCR, yes, that's correct.
Q And when you referenced the part of that letter about regional haze and the haze program, just to be clear, the statements in the letter about future review and possible future actions by Tesoro pursuant to regional haze is in addition to the application of the SCR and the VOC reductions, right?
A I presume so.
Q Can you refer to page 13 of your testimony, please. On both that page of your testimony and in some of your direct testimony yesterday, I think you were talking about the data that the Park Service used in its modeling, right?
A Yes.
Q And I think yesterday you asserted that the National Park Service used annual data for its visibility modeling, right?

A Yes, I did.
Q But they did divide that by the hours, right?
A Yes, they did.
Q Are you aware of the fact that the Park Service sought emissions information for its modeling from BP?
A I'm not aware. I am aware that they derived some of their, I think most of their emission information for their modeling from the June application. I'm not aware of other requests.
Q BP never gave the hourly emissions data to the Park Service, right?
A I don't know. Certainly the hourly data for the coker heaters were available, that was in the application.
Q That was in the application?
A Yes.
Q Are you aware that the Park Service referenced Appendix C of the application for its emissions increase input?
A Yes.
Q I just want to confirm in some places in your testimony, and I apologize, I don't have specific paragraphs, so if you don't recall, that's fine, but I believe you referenced BACT in some of the same places where you're talking about affected and modified units. BACT is a separate consideration from Class I AQRV analysis, right?

A Yes, determining what BACT is, is a separate issue, but BACT determines what the emission are that are used in the air quality related values, the visibility assessment deposition.

Q When you looked at the Q/d analysis that was done by BP, did you determine that the emissions used in the Q/d analysis also did not include short-term emissions from the affected units?

A Yes.

Q Could you turn to JE1197, and that's the FLAG guidance again, and it's page 74 of the FLAG guidance, otherwise known as JE1197. I'll try to get you the column in just a moment. If you look at the left-hand column on that page under 4.3, Contextual Considerations, do you see that?

A Yes.

Q Do you agree with me that one of the contextual considerations that the FLMs do that's listed there is what the current situation might be with AQRV impacts in a Class I area and what the trends are?

A Yes, I recall reading that in FLAG.

Q If you turn to page 15, paragraph 47, of your testimony, please. I think this is where there's some discussion of the lean oil absorption system. Are you there?

A I'm on page 15, yes.

Q Paragraph 47.
A Okay.
Q I just want to confirm your understanding that the lean oil absorption system will treat 44 percent of the coker off-gas, right?
A That's my understanding, yes.
Q But that's not required by the permit; that's voluntary in the permit, right?
A Well, it's not required by the permit, but in reality --
Q I just want to ask you about the permit itself. So the permit says that's voluntary, right?
A The permit doesn't mention it, doesn't say it's voluntary, it doesn't prescribe that.
Q Okay. Let's take a minute and look at the permit. It will take me a minute to find it, so just give me a moment. My apologies. I think it's in the technical support document for the permit. Do you recall a statement that it's a voluntary component of the permit in the technical support document?
A I don't, but I'll believe you.
Q That's okay. You don't have to. We're looking it up. We'll come back to it.

I think during your direct testimony, you talked about the fact that BP changed the baseline in their November supplement modeling to conform to what was

recommended by the Park Service. Do you recall that?
A Yes, I do.
Q And I think you were referring particularly to the deposition modeling, correct?
A I don't recall if I was referring to the deposition modeling, but I know that the modeling for both visibility and deposition were adjusted to account for the different baseline that the Park Service recommended.
Q Okay. And to be clear, that visibility modeling included only the coker heaters, right?
A Yes, but the baseline still was changed.
Q Okay. But, in fact, BP's November modeling changed the baseline but applied a scaling approach from the PSD applicability rules, correct?
A I don't know about the scaling approach from -- yes, they applied a scaling approach. I don't know that it was from the PSD rules that you suggest.
Q Okay. But the scaling approach means that it wasn't actual, right, wasn't just the actual emissions pre-project then?
A I'm not sure I understand, because I think you were talking about future.
Q My apologies. Yes. Yes. So they applied the scaling approach to compare the actuals pre-project to the post-

project, correct?
A Well, it's a projected actual --
Q Right.
A -- and what they do, what we asked them to do, we, the applicant, Kyle asked BP to identify what the effects of the project would be compared with the baseline that the National Park Service suggested or requested that they use, what's the effect of the project.
Q I understand. But that is not the approach that was used in the June application, correct, for determining what the projected future emissions would be, right?
A That's correct. In the June application, it was based on a baseline that's required by state law.
Q Okay. I think we're both getting mixed up, so I'm going to break it down. So in the November supplement, BP changed the baseline it used for pre-project emissions, right --
A Yes.
Q -- to conform to what the National Park Service recommended, right?
A Yes.
Q But for post-project emissions, BP also made a change, and that's where it applied that scaling concept, right?
A Individually by unit. It increased the emissions from each affected unit by an amount that it felt would be

the maximum the project could affect that emission unit.
Q But that's not what was done in the June application. There was a different potential-to-emit calculation that was done in the June application, correct?
A That's correct.
Q And that scaling approach was not the approach that was recommended by the Park Service?
A I'm not sure I understand. Did the Park Service make a recommendation?
Q I guess that's what I am saying.
A I don't recall that they made a recommendation on that scale -- regarding a scaling approach.
Q That's what I was asking you, is that the recommendation they made was for the pre-project baseline approach, right?
A Yes.
Q I just have a few remaining questions and they're about exhibits in the NPCA book, so let's turn to that, please. First, a few preliminary questions. Would you agree with me that the PSD applicability modeling rules, in other words, the rules for how you do calculations to determine whether PSD applies, do not apply and should not be used in AQRV modeling?
A AQRV modeling does not provide definitions that enable us to do our analyses, so in the absence of definitions

in FLAG, we do turn to any source we can get, and the best parallel we can find is those definitions that we use for new source review.

Q And, in fact, there was specific direction from EPA not to use the PSD applicability rules when modeling for AQRV assessment, right?

A You will have to point me to that.

Q Okay, I will. Are you aware of the fact that the Park Service also informed BP that BP should not use the PSD applicability rules?

A Sorry, that's my phone.

Q Do you want to take a minute. (Pause) So let's read that question back.

(Question read back by the Court Reporter.)

A The PSD applicability rules --

Q I'm not asking for an explanation of the rules. I want to know if you were aware that the Park Service told BP they should not use the PSD applicability rules in their AQRV modeling.

A It was limited to -- they said we shouldn't use the same baseline that we apply in PSD applicability, that's the extent of it.

Q So that's your testimony that that's the specific thing that the Park Service told BP about PSD applicability?

A That's my recollection, yes, that was the most significant difference.
Q And are you aware of EPA's caution to BP in its comments that the PSD applicability rules do not apply to AQRV modeling and assessment?
A I don't recall it, but I recall that there were comments from EPA, but I don't recall that one.
Q So I'd like you to turn to Exhibit P-110 in that NPCA book.
A I'm there.
Q So this looks like a series of emails from 2017 and I think you are on this series of emails, correct?
A Yes, I initiated that, I think.
Q Okay. So let's turn to that first email in the sequence in October of 2016. Do you recall that that was about the time that the Park Service supplied some written comments to BP and Ecology about the Park Service modeling and the disagreement with BP about AQRV impacts?
A Based on the text of my email, yes, that clearly was.
Q And at that point in time, I think your email was raising questions about this use of PSD applicability rules and that you had previously been unaware of that advice from EPA to not use them.
A Yes, certainly that's correct, that was a surprise.

Q Okay. And, in fact, that EPA preamble that's referenced here is from December of 2002, right?
A That's correct.
Q That's when the PSD applicability rules had a major change, right?
A Yes.
Q And the administration at that time had made some changes that allowed certain things to occur in the calculations, for example, taking advantage of contemporaneous emissions or loosened up some of the rules with respect to what baselines could be used, for example?
A It changed the rules for what the baselines could be, yes.
Q And I think there's a response from a Bliss Higgins, and I believe that's someone at Ramboll, right?
A It is.
Q Is it correct that Ms. Higgins used to be the head of Louisiana DEQ; is that right?
A She was.
Q And I think that her advice back was, yes, EPA has over the last 15 years been consistent on that point that the PSD applicability rules don't apply to AQRV analyses, right?
A That's what she said.

Q And then I want you to turn to the first page, which is an email with a number of people, and I think it's actually from Kyle Heitkamp to Ms. Higgins, but you are on that list, right?
A I was.
Q And there's some additional discussion there, right?
A Yes, there is.
Q And I think Mr. Heitkamp there is discussing the ways that the emissions increase calculations for the AQRV modeling analysis were using some of those PSD applicability rules, right?
A Yes.
Q And it's correct, isn't it, that but for changing the baseline in the November modeling as you've described for the pre-project emissions, BP did not change any of the other calculations that it did with respect to the AQRV modeling?
A Oh, no, it did change. In the November application, it changed both the baseline and, as I recall, it reduced the proposed sulfur limit for the coker heaters a little bit from 40 to 37 pounds an hour, and it also changed the way it calculated the emission increases from the affected units.
Q Right, it did that scaling approach, right?
A Yes.

Q That's an approach from the PSD applicability rules as well, isn't it?
A You asked that before, and I don't understand what you're saying when you ask that.
Q I'm saying that allowing that approach is something that is allowed or utilized sometimes in the PSD applicability applications, that's what I am asking you, if that's correct?
A For modified units, you are allowed to project the actual emission increases, so I'm not quite sure what you are referring to because these are not modified units.
Q So when you're making that projection, you can use that scaling approach, is that what you're saying, instead of potential to emit? It's different than the --
A Yes, that's correct, it's different from potential to emit that applies to new and sometimes modified units.
Q That is what I was asking.
A Yes, that's right.
Q I think it's your testimony that you've been involved in reviewing AQRV assessments during the course of your career, correct?
A Yes.
Q You hadn't done the modeling yourself, but you had a lot of experience reviewing them, right?

A Correct.
Q And you've got extensive experience in PSD permitting?
A I believe I do, yes.
MS. BRIMMER: I'd move admission of Exhibit P-110, please.
MR. WISE: Any objections?
MS. COX: No, Your Honor.
MR. WISE: P-110 is admitted.
(P-110 admitted.)
Q (By Ms. Brimmer): I'd like you to turn to P-103, please.
A I'm there now.
Q Now, in anticipation of some discussion on this, I know that this email goes back a ways to a date before work on this permit, but because you've been testifying some about BART and how that may or may not, and haze, may or may not apply to this project, I want to ask you just a couple questions about this.
MS. COX: You Honor, we're going to object to any questions about this email. It's from 2010 before the project was even in early stages of the application preparation.
MR. WISE: Ms. Brimmer.
MS. BRIMMER: Yes, Your Honor. We believe that this is relevant to, one, the testimony

about the interplay with respect to regional haze and PSD permitting, and there's been testimony that these issues about AQRV, as it affects the parks, are better dealt with in the haze program, and so it does reference BART, which is a concept in the haze program, and, more importantly, it goes to credibility issues with respect to this witness and BP more generally.

MR. WISE: I'm going to sustain the objection. I just don't see the relevance here, I don't see the connection to regional haze, and I mentioned earlier that I was not inclined to admit these earlier exhibits for the purpose of attacking BP's credibility, so I'm going to sustain the objection.

MS. BRIMMER: Understood, Your Honor. I would make an offer of proof. We need to make sure that while this is not admitted into evidence, this email is available in the record in the event of an appeal, so I would make an offer of proof. We can either leave the written exhibit in the exhibit books, but understand it is not admitted into evidence and will not be considered by the board, or I can read the email into the record, whatever you prefer.

MR. WISE: I believe our procedure is on not admitted exhibits, we leave them in the notebooks so they would go up on appeal; it's just they're not

admitted into our consideration.

MS. BRIMMER: That's great. That's a perfectly workable solution. Thank you.

Q (By Ms. Brimmer): Turn to P-99, please. Are you there?

A Yes.

Q This looks like an email from 2016 from you to Mr. Heitkamp, correct?

A And others, that's correct. Yes, to Kyle.

Q And do you recall this email?

A Barely, but yes. I recognize it.

Q Okay. If you want to take a minute to review it and then I will ask you a few questions.

A Yes. This was the big gulp moment when we received the information that the 2002 preamble baseline calculation should be applied.

Q I just wanted to confirm a few points here. You note there's some concern, in this middle paragraph, about how this might affect the review process on the project, right?

A Yes. We had done the application based on state law and this was a wrinkle in it because they revealed a preamble citation that said we should have done it differently.

Q And were there concerns about what that revised modeling might show?

A Yes. It was going to reduce the baseline and, therefore, suggested that there were higher impacts for the project.

Q And then in the last paragraph, you said because we don't calculate the short-term emission increases based on annual baseline values, you don't think it has a bearing on your visibility assessment, which was the primary concern raised by the National Park Service. Do you see that?

A Yes, I do.

Q Am I reading that correctly, it's just kind of a confirmation of what we've been talking about quite a bit here is that BP did not even model short-term increases for visibility assessment for all the units?

A Only the coker heaters that had the increase in maximum emissions.

Q And you do acknowledge that was in fact the primary concern raised by the National Park Service, right?

A I don't recall -- You mean that the affected units were not included?

Q Well, I'm just trying to confirm the statement in the email, of that sentence in that last paragraph.

A I don't see where it says that.

MS. BRIMMER: Okay. I would move admission of P-99, Your Honor.

MR. WISE: Any objections?
MS. COX: No objection.
MR. WISE: P-99 is admitted.
(P-99 admitted.)
MS. BRIMMER: I have nothing further, Your Honor. Thank you. Thank you, Mr. Hansen.
MR. WISE: I think this is a good time to go ahead and take our mid-morning break, so we'll come back at 10:30.
(Recess from 10:10 a.m. to 10:30 a.m.)
MR. WISE: Ms. Cox.
MS. COX: Thank you, Your Honor.

REDIRECT EXAMINATION

BY MS. COX:

Q I'd like to clarify just a couple things that came up during cross. In the June application, the analysis BP followed was consistent with FLAG and the Washington regulations, correct?

A I believe so.

Q And BP revised the November supplement in response to National Park Service comments, correct?

MS. BRIMMER: Objection. This is redirect. It's leading.

MR. WISE: I'll allow it.

Q (By Ms. Cox): I can rephrase. Did BP revise the November supplement in response to National Park Service comments?
A Yes.
Q Does Mr. Gebhart agree with the visibility calculations for the new coker heaters in the November supplement that BP submitted?
A His testimony, his written testimony, implies to me that he did agree with it.
Q So the sole issue is whether BP calculated emissions increases from the affected units using the equation NPCA suggests.
A Yes.
Q And what is the equation that NPCA suggests using to calculate emissions increases from affected units?
A That the affected units be evaluated based on their potential emissions from the unit rather than what the project is going to cost.
Q And what would happen if you applied that calculation to a unit that is in no way affected by a project, so in no way experiences emissions increases on a daily or annual basis from a project, what would that equation show?
A It would distort the effect of the project for sure because the application would normally say there is no increase in emissions and you would be asked to apply

the potential emissions from that unit.

Q I would like to now turn to page 19, paragraph 51 of your direct testimony.

A Page 19.

Q We've heard a lot today about how BP's calculations take into effect the potential increases on various days, not the peak maximum worst-case day increase, but whether there are incremental increases on certain days on downstream affected units as a result of the project and how those are taken into account. Can you describe Figure 1 and how FLAG directs you to calculate visibility-related impacts.

A Figure 1 tells us to evaluate the newer modified source by first doing the Q/d analysis, and if you pass, you can presume no impact; if you fail, if Q/d is 10 or greater, it's greater than 10, then you go to the more detailed analysis, which was what was included in BP's analysis. If the analysis shows that the impacts are less than the visibility criterion, then you can again presume no impact. If the analysis shows that the impacts are greater than that 5 percent indicator, then you go on to evaluate context, and context is where you start talking about how many days does this occur, what's the extent of the impact geographically, and what are the other trends in the national parks. So those

contextual considerations occur after you fail the test, not before.

Q And yesterday we read several passages in FLAG regarding the visibility impacts analysis, and many of them talked about the maximum 24-hour emissions from a project. Can you describe the importance of the maximum 24-hour emissions and the impacts on Class I areas?

A It's the maximum 24-hour emissions that cause the impact. FLAG says over and over thou shall use maximum 24-hour emissions to calculate visibility impacts, and the maximum 24-hour emissions attributable to the project.

Q And would average daily emissions give you a similar analysis as maximum daily emissions?

A It does not, no. That's why they specified maximum so many times.

Q Would that adequately show the level of intensity and effect of visibility emissions on a Class I area if you looked at average daily emissions?

A Generally not.

Q And that's why you look maximum daily emissions?

A Yes.

Q Thank you. No further questions.

MR. WISE: Any other redirect? Board questions? Ms. Marchioro.

EXAMINATION

By MS. MARCHIORO:

Q One thing I wanted to ask you is about that Tesoro letter. Have you had a chance to review the letter that the -- it was Exhibit R-53 -- regarding the Tesoro plant in 2017?

A Yes. I read from that on the third page or the last page.

Q Well, had you seen the document before today?

A Yes, I have.

Q And have you read it before today?

A Yes.

Q Okay. I'm just trying to understand if you were looking at -- and maybe you can tell me -- is the modeling analysis that the National Park Service was doing for the Tesoro facility the same as the modeling analysis it did for BP?

A It's generally the same concept, yes.

Q Okay. And I'm trying to understand from your experience, is that the same modeling that the NPS has been applying to these types of projects, in your experience, over the last 15 or 20 years?

A Well, the Park Service hasn't done independent modeling that I am aware of on projects here in Washington over the last 15 or 20 years. This is the first time in my

experience that they have decided to conduct their own modeling for the BP project and for Tesoro. There may be other occasions, but I never saw it.

Q Okay. So in terms of if I was trying to come up with an understanding of the Park Service's consistent view on this particular issue, I have two potentially different answers.

A Yes.

Q And I'm just curious, is it a timing issue that one came in 2016 and one came in 2017? We haven't had an election. Is it a change in administration that drove that, do you know, from your experience?

A That the letter came?

Q That the --

A Oh, oh, so perhaps that the Department of Interior had a change of heart?

Q Yeah.

A I couldn't say.

Q Thank you for that. And so in terms of the modeling, it looks like the NPS used CALPUFF and some other different modeling. I know that one. Are those models different than the models that were run by Ramboll? Did they use a different modeling software or just different inputs?

A No, just different inputs. No objections to the way they ran the model.

Q Is that a standard industry model?
A It is.
Q And so we were talking about physical change, and on R-30, page 18 --
A Sorry, I don't know which notebook.
Q It should say BP exhibits, and R-30 is Ecology's guidance?
A Okay.
Q And at page 18, I'm just trying to understand, it talks about an increase in utilization as a result of the project.
A Sure.
Q So that's that first full paragraph under subsection B. What does that mean to you?
A We can forget about the confusing language about aggregation. That's not relevant here. It's affected emission units. We define affected units as those that will experience an emission increase as a result of the project, so it's an increase in utilization, so if, for example, the coker heater were able to put more product out on a given day, those downstream units would feel an increase -- they could process more and have higher emissions, but the coker heater can't. However, because of the elimination of the dips that we have been talking about in that one line due to online cleaning, they can

process more material over the course of the year so there is an increase in annual utilization.

Q I'm sorry, can you say that again. It was a little soft for me. There is an increase or there is not?

A There is an increase in utilization of the affected units over the course of the year, and that's why it's included in the deposition analysis.

Q But then we get back to the issue of annual versus daily max or visibility versus --

A Correct.

Q And so what would constitute a physical change, in your opinion, of the unit?

A Changing the burner so that the unit can fire harder. Sometimes as little as changing the plumbing that goes into the unit so that it can process more fluids. There are a number of things that can affect the firing rate. As mentioned yesterday about physical change, it's usually a plumbing or firing rate issue or something like this.

Q And so in this instance, there may be more intensity of use because there's no downtime --

A In this case.

Q -- in terms of the downstream units are going to be being used, more off-gas, more --

A No. More product.

Q More product.
A Over the course of the year, but no more on a given day than they can process today, than they receive today.
Q And then in your understanding, does Ecology run its own separate modeling?
A They have very skilled dispersion modelers there who review the modeling that applicants submit. Whether they completely remodel it independently or not I think depends on the situation, but they certainly review the inputs and the assumptions that go into the modeling every time.
Q Does that include the AQRV modeling?
A Yes.
Q Thank you.

MR. WISE: I had some questions, just a couple here.

EXAMINATION

BY MR. WISE:

Q Back to the regional haze. I believe it was your testimony that you thought that was a sort of a way of addressing some of National Park Service's concerns?
A Yes, I do.
Q Okay. And there was that Tesoro letter that you read from. Are you aware of any other letters like that at

other refineries?
A I'm not.
Q And I think you said that it wasn't in the -- there was a set of rules that you said, that that regional haze as a substitute, there is no law that you know of that supports that concept of addressing AQRV impacts through a regional haze program?
A Well, that's its purpose is to address the existing problems through a regional approach, so, yes, that's its purpose is to address visibility.
Q But are you aware of any specific place where it says -- where it supports the idea of substituting -- I don't know, that question is not coming out right.

Are you aware of National Park Service, any communications for them on the concept of the regional haze in this project?
A On this particular project. I have to think for a minute.
Q Sure.
A So the question is whether there is any communication from the Park Service related to the regional haze rule and this BP project?
Q Yes.
A I don't recall any.
Q Okay. Just one other question. Could you go back to

P-99. It's in the larger notebook.
A The green notebook?
Q Yeah, green notebook. It was a 2016 email from you.
A Yes.
Q And in the third paragraph there, I just was curious about a parenthetical that's in that first sentence. It says, "Our visibility assessment which is or was the primary concern raised by NPS." Do you remember why you put the parenthetical in there "Or was"?
A Let me think about that. I honestly don't. I don't know why I put that.
Q Okay, you don't recall. That's all I have.

Ms. Brown.

EXAMINATION

BY MS. BROWN:

Q I think you said that there should be different treatment for affected units versus new or modified units.
A How we address them in the application?
Q Yes.
A Yes.
Q And why is that? I think I know the answer to this, but I want to hear the answer.
A Well, we follow the rules. The permit applicants need

to follow the direction that's either in a FLAG document, where available, or in other new source review rules, so EPA, Ecology, they have rules, and we have to be very careful about following the rules and they specify different ways of calculating emissions for modified or affected units.

Q And then on this regional haze rule, you might not be the best person to ask this question of, but do you have sort of a general idea of what tools are available to regulatory agencies to implement things under the regional haze rule?

A Well, yes. Alan Newman is probably the expert on that, he'll be testifying later, but there is a state implementation plan for dealing with visibility and it addresses reductions in emissions from industrial facilities, including BP. There were changes to BP permits to reduce its emissions as part of this state program, visibility program. There is significant reliance on reductions in sulfur content in motor vehicle fuels, that's one of the big ones. It tries to touch on all the different sources of emissions in the region, not just industrial facilities. But I would say that the attempt -- the benefits from fuel improvements, quality of fuel, lower sulfur, lower benzene reductions that actually allow the use of catalytic controls,

that's really one of the major sources of visibility improvement.

Q So under this program, can Ecology go back and require emission reductions? I know in general for air quality matters, that Ecology can't usually go back and require emission reductions unless the facility is doing something like modifying something or --

A No, I believe Ecology does have the authority to do that. There is another update coming, and I'm not certain, I think it's 2019, that the regional haze rule requires states to revisit their program to ensure continued progress. They talk about a glide slope toward that ideal visibility scenario in 2064 and they want to make sure that there's progress on that glide slope and that it continues, and so I think Ecology revisits the program in place and could very well include additional restrictions on industrial facilities. That's why the Department of Interior said we'll be back and we'll talk about that in the next update for Tesoro.

Q So BP could be asked to reduce under that regional haze program?

A I believe so.

Q And then I understand that the Park Service is saying that there are more days that visibility will be

obscured from BP?

A There are more days when there would be an effect from BP. The distinction I make is that we're interested -- as practitioners, we want to identify whether or not there is a perceptible change, and that's that 5 percent change in extension, 5 percent change in visibility in a Class I area. It's true there could be a change of 1 percent effect to 1.2, but we're interested in whether or not it exceeds that criteria of 5 percent, and it does not.

Q So the way the Park Service calculated it, though, they concluded that it would?

A Yes, they did, because they used that annual emission inventory.

Q Right. So they concluded it would be 5 percent or --

A They did find a couple of places or a couple, and I think it was only in Olympic National Park, where it barely exceeded 5 percent.

Q And then so on this AQRV modeling, I understand that it's provided for in the law, but are there any rules about how to do it or is all we have is the FLAG guidance?

A All we have is FLAG guidance.

Q So there aren't any CFRs or anything that say how this is to be done?

A The federal rules and the state rules require us to do the analysis; it doesn't specify how. It doesn't provide prescriptions on how to do it.
Q So the only guidance is in this FLAG document?
A FLAG and whatever we can derive from state law for new source review programs.
Q So you're kind of using that by analogy?
A By necessity, yes.
Q All right. Thank you.

MS. MARCHIORO: I have another question.

EXAMINATION

BY MS. MARCHIORO:

Q Ms. Brown was asking you about the NPS calculation, that there would be an increase in visibility impairment, if I understood that correctly, and your answer is that they use the annual data to achieve that.
A That's how the National Park Service did their modeling.
Q What did they do in the Tesoro, from your understanding?
A I believe they applied the same approach.
Q And then did they reached the same conclusion?
A Yes.
Q Okay. Thank you.

MR. WISE: Okay. Any follow-up to

board questions. Ms. Brimmer.

MS. BRIMMER: Yes. Thank you.

FURTHER EXAMINATION

BY MS. BRIMMER:

Q Mr. Hansen, I'd like to start off with discussing some of the questions from Judge Wise and I think a little bit touches on some questions from Judge Brown as well, and that's about regional haze, and I think you said something about, in response to Judge Wise, I think he was posing questions to you I think following up on some of our discussion about you can't substitute one for the other, in other words, there is nothing in the Clean Air Act that says that the regional haze section of the Clean Air Act is somehow a substitute for the PSD obligations of the Clean Air Act. Do you recall that?

A Yes.

Q Okay. And I think in response to Judge Wise, I'm sorry, I'm scribbling notes as fast as I can --

MR. WISE: And my question was totally opaque, so --

MS. BRIMMER: No, no, we were tracking.

Q (By Ms. Brimmer): You said something about that's its purpose. Do you recall that?

A I need a little background.
Q That's what I captured, and I think you were talking about the purpose of the regional haze provisions is to address AQRVs; is that a fair characterization of what you were maybe saying there?
A The regional haze rule is to address regional visibility issues, yes.
Q Right. So let me get to the nugget of that. So let's just be clear. There are the PSD provisions in the Clean Air Act, those are at 42 U.S.C. Section 7475, and that's what's going on in this case, right, the PSD permitting requirements?
A I'm not sure I understand what you just cited.
Q Sure. Would you agree that 42 U.S.C. 7475 are the PSD permitting requirements in the Clean Air Act?
A I have to admit that we focus on the CFR 52.21.
Q Okay. Would you agree the Clean Air Act is the foundation for the CFRs?
A Yes.
Q So putting aside the specific cite, there is a specific provision in the Clean Air Act that controls PSD permitting, right?
A 52.21 tells us how to do PSD permitting.
Q I'm talking about the Clean Air Act.
A I believe you. Yes, of course.

Q You don't have to believe me. Do you --
A I have to say that my focus is on the CFR, not the Clean Air Act itself.
MS. SHIREY: I am going to object because these questions are going to legal conclusions.
MR. WISE: Would you like to rephrase.
MS. BRIMMER: I don't think I am asking for a legal conclusion. Mr. Hansen has presented himself as an expert with multiple decades of experience on Clean Air Act permitting, including PSD permitting, and he's testified on regional haze. I am not asking him for a legal conclusion, I'm trying to get at his understanding of these two programs and where they arise.
MR. WISE: I will overrule the objection. Go ahead.
MS. BRIMMER: Thank you.
Q (By Ms. Brimmer): So I am sorry, Mr. Hansen. Let's start over.
In the Clean Air Act, there is a separate section for PSD permitting; is that your understanding?
A That is my understanding.
Q And that's really what we're talking about here today. It sets up the AQRV modeling requirements and it sets up the federal land managers' involvement in that process,

right?
A Yes.
Q And it provides for an affirmative responsibility for the federal land managers to ensure that those AQRVs are protected, right?
A Yes, it does.
Q There is an entirely separate section of the Clean Air Act, I won't throw out citations, and that concerns regional haze, right?
A Yes, it does.
Q And that section, I think, as you talked about it just now, it is more of a program kind of thing, it's a regional approach to haze, right?
A Honestly, I am aware of the fact that there is a regional haze rule, we were involved in the implementation of the BART plan of that, I have reviewed the state's implementation plan for the regional haze rule, but I did not have any reason to trace it back to the Clean Air Act.
Q Okay. So in your response to questions from Judges Brown and Wise about haze, I think you said that BP had been subjected to some controls as part of the regional haze program; is that an accurate characterization?
A Yes.
Q And I think you used the word BART, and that stands for

best available retrofit technology, right?
A Yes.
Q And that's a one-time application under the regional haze rules, right?
A I believe that's correct.
Q And the continuing obligations under the haze rule go primarily to the State of Washington, right?
A That's my understanding.
Q And the State of Washington has a continuing obligation to plan and strategize how to clean up the air in the Class I areas, right?
A Yes.
Q But there's nothing in those provisions, is there, about imposing additional requirements on a source like BP outside of PSD permitting, right?
A My understanding is that Ecology has the discretion to develop a program that most effectively addresses the visibility problem, so if there were no issues with respect to industrial sources, there wouldn't be any need for any further action there.
Q I don't think that was my question. Even if Ecology in its strategy thought that perhaps major sources were still causing a problem, the only way it can get at that is through PSD permitting; it can't knock on BP's door and say, "Oh, by the way, we're going to impose more

stringent BART controls on you because of the regional haze strategy," right?

A My understanding is that Ecology could do that and that's why the Department of Interior said we'll be back at the Tesoro facility and suggested that they would revisit the issue then.

Q Where in the law does that understandings come from?

A I don't know the law.

Q Okay. Just a very quick question to follow up on Judge Marchioro's question. She had you reference R-30, page 18. Is that still in front of you?

A I should know by now, but which binder is that?

Q That's in the BP exhibit binder.

A Okay.

Q So I think you were talking about some of the requirements on page 18 with Judge Marchioro, correct?

A Yes, we were.

Q I want you to turn back to page 5, please. Are you there?

A Yes.

Q And I want to be clear, the provisions that you were discussing with Judge Marchioro fall under that PSD applicability heading, correct?

A That's correct.

Q Thank you. I have nothing further.

MR. WISE: Ms. Shirey, any follow-up?

MS. SHIREY: No.

MR. WISE: Ms. Cox.

MS. COX: I have one.

FURTHER EXAMINATION

BY MS. COX:

Q I would just like to clarify or give you a chance to clarify your response to a question from Judge Marchioro about the Tesoro example. In that situation, the National Park Service determined that the project would have an adverse impact on visibility from the project or the facility as a whole?

A I would want to refer to that letter again before I answer.

Q Sure. It's R-53.

A I believe the response referred to the project, but I want to make sure.

Q And you can look again on page 5, the second-to-the-last paragraph, if that helps.

A Yes. It said, "The visibility comments provided here do not apply to the currently proposed modification." They were referring to the impacts from the refinery as a whole.

Q No further questions.

MR. WISE: Thank you, Mr. Hansen. You may be excused. So is that the extent of BP's witnesses?

MS. COX: Yes, Your Honor.

MR. WISE: And then, Ms. Shirey, are you ready with your witnesses?

MS. SHIREY: Yes.

MR. WISE: Please call your first witness.

MS. SHIREY: I call Alan Newman.

ALAN NEWMAN, having been first duly sworn by the Certified Court Reporter, testified as follows:

DIRECT EXAMINATION

BY MS. Shirey:

Q Could you, Mr. Newman, state your name and spell your last name for the record.

A My name is Alan Newman, A-L-A-N, last name N-E-W-M-A-N.

Q And where are you working right now?

A I'm employed by the Department of Ecology.

Q And what is your job?

A My job is the senior quality engineer for the program. I do policy work and rule development currently. My

history with the program has been various tasks all the way from being a field inspector and permit writer to writing PSD permits and writing regulations.

Q When you say the program, what program?

A Program being the Department of Ecology's air quality program.

Q And how long have you been part of that program?

A In two separate employment periods, just about 32 years.

Q Could you turn to Exhibit R-2, Ecology's R-2.

A Yes.

Q Do you recognize this document?

A Yes. This is my work history that I've prepared for this and other actions.

Q I just want to hit some of the highlights here. It talks about your education. Could you describe your education.

A I have a bachelor's degree in civil engineering from the University of Washington. I have an associate degree from Olympic College before that. I've been registered since 1983 as a professional engineer in Washington, and I've maintained that registration continuously.

Q When did you first start working with the Department of Ecology?

A I started working at the Department of Ecology in September of 1975 as an EPA employee. I started working

for the Department of Ecology in October of 1976 as an Ecology employee.

Q And have you done air quality work the entire time?

A Almost the entire time. For the period from about 1980 until 1992, I also did water quality permitting, solid waste inspection and permitting and did wastewater construction grants engineering work for the department.

MS. SHIREY: I would ask the board to admit Ecology Exhibit 2.

MR. WISE: Any objections?

MS. BENNETT: No, Your Honor.

MR. WISE: Ecology Exhibit 2 is admitted.

(R-ECY-2 admitted.)

Q (By Ms. Shirey): So in your job as an air quality engineer at Ecology, did you have a formal role in permitting the BP coker heater project?

A I did not have a formal role in the permitting of this facility.

Q Were aware of the coker heater project?

A I was aware of the coker heater project and the permitting actions. The staff working on it sit adjacent to me, and given the nature of our office, it's difficult to be totally shielded from such work.

Q So from time to time, did you answer questions related

to this?
A Yes, I did.
Q So your knowledge of this project is somewhat limited?
A Yes. I would say it's an incomplete knowledge.
Q So I want to turn to the regional haze program that we have heard a little bit about already this morning. What is your role in the regional haze program?
A Currently, I'm working on developing a list of facilities that will be reviewed for four factor analysis and for maintenance establishing reasonable progress goals for the 2021 SIP submittal.
Q That's great. I was actually wanting a more --
A I have been involved doing with the regional haze program specifically, including from before, from about 1995, again, working on regional haze issues related to the Centralia Power Plant's RACT analysis and coordinating that with regional haze requirements for the BART program at that time.

I was involved with working on updates to the state regional haze -- at that point it wasn't regional haze -- but our visibility SIP for '97 and '99.
Q So would you say that you are the lead engineer at Ecology for regional haze?
A Yes. I'm probably the only engineer who works on regional haze.

Q Thank you. So could you give just a general quick description of what the regional haze program is.
A The regional haze program is an outgrowth of the federal Clean Air Act, and it requires states to develop plans to bring the visibility impairment -- it requires the states to develop planning documents, and by rule, in the 1999 regional haze rule, on ten-year increments, those plans are to be developed and updated to bring all of the mandatory federal Class I areas in the United States to a level where there is no anthropogenic impact on visibility.
Q By when?
A And the law does not contain a date. The rule that EPA issued contains the date of 2064 as the date upon which to achieve that goal. The regulations, however, allow states to not have to meet that goal if they can demonstrate to the satisfaction of EPA the rationale to not be able to meet it.
Q But, in general, the goal is to meet the standard of no anthropogenic impacts on visibility at Class I areas by 2064?
A Correct.
Q Are states required to develop plans to meet that goal?
A States are required to develop plans on a ten-year cycle. The first one was actually due nationally in

2007. Due to various delays from the regional planning organizations that assisted the states in doing that work, most of them weren't submitted until 2008 or '9 or, in Washington's case, '10. The next regional haze plan is actually due by rule in July of 2021. The following one is July of 2028 and on a ten-year cycle from there.

Q So I believe you said that Washington did provide a plan?

A Yes, we submitted a plan; it's dated 2010. It may have actually been submitted to EPA in early 2011.

Q So what is the next step after providing that plan?

A The next step after providing the plan is for states to do a five-year review after the plan is submitted on progress towards attaining, in this case, it was our 2018 reasonable progress goals.

Q Could you turn to Ecology Exhibit 8.

A Okay.

Q Do you recognize this document?

A More than I'd like to.

Q What is this document?

A This is Washington's 5-Year Regional Haze Progress Report.

Q And what's the date on it?

A It's September of 2017.

Q Did you write this report?
A I wrote essentially every word of it.
Q So what does it show about visibility in Class I areas in Washington?
A What it shows in general is that visibility in Class I areas in Washington State is improving and has improved at least as much as required to meet our reasonable progress goal for 2018, and this was as of the end of 2014, which is the end of the analysis period, and that in most cases in Class I areas, we exceeded the uniform glide path rate of control.
Q Could you turn to page Roman Numeral IV, I-V. That's the Executive Summary.
A Yes.
Q And could you read the last sentence on the page, last couple sentences.
A The last -- the whole paragraph or the partial paragraph?
Q I am sorry, the partial paragraph.
A "Washington continues to reduce air pollution that produces regional haze. Because of this, visibility is improving in these areas. Overall, the Class I area visibility record shows improvement since the 2000-2004 baseline period. Levels measured in the 2010-2014 period met or exceeded the 2018 visibility goals."

Q Thank you. And then I believe does this document show how the -- or show that, I guess, that the state is meeting its goals?
A Through various graphs that have been developed based on the monitoring data.
Q Could you turn to page 22 of this document.
A Okay.
Q And I want to focus your attention on Table 3.
A Okay.
Q What does Table 3 show?
A Table 3 is a compilation of the Washington State emission inventory. The Washington inventory specifically is the columns headed 2005 and 2011.
Q There are two columns headed WRAP, W-R-A-P. What is that?
A WRAP was the Western Regional Air Partnership. It was the regional group that did develop emission inventories and did the bulk of the dispersion modeling for visibility impacts in all Class I areas in the 13 western states involved in the program. The two dates associated under there, the 2002d inventory, that is a specific inventory that was used to determine the baseline conditions for the modeling purposes. And that was developed for all states based on information. That was what was used, like I said, that was the baseline

modeling.
Q So the baseline modeling --
A Baseline modeling for what is the visibility, modeled visibility impairment, in the baseline period of 2000-2004. So this was using direct decisions and directives from EPA.
Q And where was this impairment?
A Okay, this is just inventory.
Q Oh, this is inventory, this is emission inventory.
A The table is inventory.
Q Thank you. So what does this show for nitrogen oxide?
A What it shows is that stationary source emissions have gone down, area source emissions have gone down and gone down significantly, mobile source emissions have gone down, but they've also gone up as we have more cars. Locomotive emissions have gone down, marine vessel emissions, they have all gone downward.
Q So total, I think on the top of 23.
A Top of page 23, it shows that for 2011, the emissions for 273,791 tons of nitrogen oxide emissions. Comparatively, the inventory for 2005 was 303,964 tons, and the WRAP inventory was even higher at 378,384 tons.
Q So what is the WRAP 2018 number, which is the right-hand column there?
A The WRAP 2018 number was a projection of emissions that

the WRAP modeling group and the emission inventory group developed, principally the emission inventory group developed, in order to predict what the emissions would be in the future from all of these sources in these categories, including the effects of the emission reduction programs, BART requirements, federal rules, and the growth and utilization, the growth of population as they affect emissions. These are the emissions that were used for projecting modeling emission conditions in 2018, which were used in part to define the reasonable progress goals for each Class I area.

Q Would you turn to page 27 in this document, Table 4. So what does Table 4 show?

A Table 4 is a table of the monitored values of the Class I areas and the depiction of what the reasonable progress goal was and the uniform rate of progress target. So the column titled 2000-2004 Baseline, that's what the ambient monitors at the Class I areas that are used to determine visibility impairment in the field, this is what their deciview impacts were at that time. The column 2010-2014 Visibility, it's the next-to-the-last column on the right, that's what the actual calculated visibility impairment for the five-year averages of the worst days, that's this whole table is the worst days, that's the calculated numbers

of what was actually measured for that period. And the middle two columns with the goal and the uniform rate of progress are just that.

Q So the baseline, for example, for Olympic National Park was 16.74?

A Yes.

Q And the 2010 to 2014 was 13.82?

A Yes.

Q And on the far right column is the column that says are you meeting the 2018 reasonable progress goals.

A Yes.

Q And what are the answers there?

A And the answer there is yes.

Q For all of the --

A For all of the national -- all of the federal mandatory Class I areas.

MS. SHIREY: I would ask the board to admit Ecology Exhibit 8 into evidence.

MR. WISE: Any objections?

MS. COX: No.

MS. BENNETT: No, Your Honor.

MR. WISE: Ecology Exhibit Number 8 is admitted.

(R-ECY-8 admitted.)

Q (By Ms. Shirey): So as you have heard, the National

Park Service has expressed concerns about adverse impacts from BP's project, well, from BP on national parks, and are you familiar with that or should I point you to an exhibit?

A No, I'm familiar with that.

Q And that the National Park Service actually provided an adverse impact determination?

A Yes.

Q So what does that mean in the regional haze program when you get an adverse determination, adverse impact determination?

A If I considered it the same as an adverse impact determination under 51.302, that means the Washington State Department of Ecology has to evaluate that facility for a SIP update and potential emission reduction requirements. By the rule, that SIP update for this timing is allowed to occur as part of the 2021 regional haze plan.

Q Do you have any tools to ensure that you meet the goals?

A I have the ability -- under the federal Clean Air Act, I have the four factor analysis process, which is used to develop reasonable progress goals for visibility impairment. At the state level, I have the reasonably available control technology process that I can utilize to require emission reduction at a source if I can

define that it meets the criteria to follow that program.

Q Thank you. I want to turn now to AQRV analysis. So in your work at Ecology, have you ever reviewed an AQRV analysis?

A Yes.

Q When, in what context?

A I have reviewed it personally for three permits that I've worked on and I have reviewed it in conjunction with the engineers writing permits that I have overseen as their supervisor.

Q And these are PSD permits?

A These are PSD permits.

Q Any idea how many times you've done that over the years?

A Like I said, three times at least for permits that I personally issued, plus every permit that we have issued from the agency since 1993 through until about -- until Marc Crooks took over the function about five years ago.

Q Are you familiar with the Q/d screening analysis in the FLAG guidance?

A Yes.

Q What is a Q/d analysis?

A It's a screening tool used to -- used by regulators to determine whether a source has significant enough impacts to make it worth the trouble to spend the time

to look at it in more detail.
Q So could you turn to Joint Exhibit 11, and it's in one of those two green ones, probably the bigger one.
A Okay. I'm there.
Q So turn to page 18 in this document.
A Okay.
Q So in Section 3.2, Initial Screening Criteria, are you there?
A Yep.
Q And the right-hand column talks about inputs to Q/d analysis. It also talks about how EPA introduced screening criteria in the BART guidelines. Do you see that on the left side on the bottom?
A Yes, I do.
Q And can you describe that a little bit. Are you familiar with that?
A Yeah. And I wasn't reviewing the documents when EPA developed this, but, yes, I'm familiar with its utilization as a screening tool to determine whether their source is worth having -- whether it will have an impact that could be subject to BART.
Q So did you use it in your BART analyses?
A I actually did not use it.
Q And why was that?
A Because my work was focusing on the other criteria that

had to be utilized and all of our sources, even if I had used it, they would have failed the test --

Q Okay.

A -- the ones that were subject, ended up being subject to BART.

Q So have you used the Q/d test yourself or --

A I have evaluated Q/d as part of the process of figuring out who the agency will look at for reasonable progress goals for the '21 SIP.

Q Have you looked at Q/d in a PSD context?

A Historically, yes, as has been applied by the Park Service and the Forest Service, to determine whether the source is a large enough source that they wish to expend any resources to review.

Q So can you look at the right-hand column there on page 18 and just tell me what it says about what the inputs to a Q/d analysis are.

A In general, the inputs are the emissions of nitrogen oxide, sulfur dioxide, they extended it to PM10 and sulfuric acid mist. That's the Q. This doesn't actually talk about how Q is calculated other than what's included. And the "d" is the distance of the source from the Class I area in kilometers. Q is in tons.

Q And further down on that column, I think it does talk

about --

A Yeah, there at the bottom.

Q So the sentence that starts, "Therefore, the agencies," could you read that?

A Therefore, the Agencies will consider a source locating greater than 50 kilometers from a Class I area to have negligible impacts with respect to Class I AQRVs if its total SO2, NOx, PM10 and -- sorry, I'm going to back up -- sulfuric acid mist annual emissions, in tons per year, based on 24-hour maximum allowable emissions, divided by the distance from the Class I area, in kilometers, is 10 or less.

Q Therefore, the agency will consider a source to have negligible --

A To have negligible impacts.

Q Okay. Thank you. In paragraph 22 of Mr. Gebhart's prefiled testimony, he says Q/d is irrelevant for BP's project because the two national parks, North Cascades National Park and Olympic National Park, are already impacted by emissions. Do you agree with that assessment?

A No, I don't. I don't agree with that assessment because the purpose of this is to evaluate impacts from a project, from a new source or from a modification to an existing source. It's not a criteria that you can

ignore or should ignore simply because a source already has adverse impacts.

Q Would you turn to, and I have the JE page number, so on the bottom of these, JE1121.

A Okay. That's the graphs.

Q Right. So Figure 1, what does Figure 1 show?

A Figure 1 is a flow chart of what the Park Service says they will use to assess their level of involvement in a new or modified source.

Q And what does it show about Q/d?

A It's a preliminary question and if Q/d is less than or equal to 10, yes, then they have a presumption of no adverse impact.

Q Is there anything in there to indicate that Q/d, there is any limitation to when you would use Q/d?

A No, not that I've ever read in this document.

Q So nothing in this document that might indicate a limit on when to use Q/d?

A Not that I can recall ever having read.

Q Okay. In your experience, have Q/d analyses been used to screen out projects from other facilities that already impact Class I areas?

A Yes.

Q So moving on from Q/d, for the visibility portion of the AQRV analysis in this case, BP determined the net

emissions increases from the coker heater project by looking only at short-term emission increases. Is that the correct way to do it in your opinion?

A Yes.

Q And why is that?

A Because that's the only new emissions, the only new allowable emissions that will come under this project.

Q And I neglected -- well, yeah, for the visibility portion of the AQRV analysis?

A For visibility.

Q What is it about visibility that --

A Because it would be looking at the change in 24-hour impacts for the input to this modeling to determine whether or not it's a significant change.

Q So is there something about visibility that would point you to looking at 24-hour emissions?

A Nothing specific, other than convention is you look for -- for regional haze purposes, at least, visibility is analyzed on a 24-hour emission impact basis, it's not looked at on an hourly rate basis or an annual rate, just -- I can keep going.

Q So the visibility looks at short-term emissions because visibility itself --

A Short-term emissions would be under 24 hours duration. Twenty-four-hour emissions are 24-hour emissions.

Long-term emissions would be longer than a 24-hour period and going all the way up to annual emissions.

Q So why would you use 24-hour emissions when evaluating visibility impacts?

A As a supposition, one answer is that that's the time period upon which the ambient monitoring data that's used to characterize visibility is collected. It's a 24-hour integrated sample and, therefore, it's difficult to say what a one-hour rate would go and then give you an answer there.

Q Would you look at annual emissions in order to evaluate visibility impacts?

A No.

Q Why not?

A Because annual emissions, at best, would depict an average condition, and average is not what we look at in visibility.

Q So in BP's case, because they looked at just the short-term emission increases, it means they only looked at emission increases from the coker heaters because those are the only emission units that will have short-term emission increases that will be caused by the project?

A That's my understanding.

Q And is that the correct way to do it?

A That's how I would do it. That's what I understand is the correct way to do it.
Q So the project will cause annual increases in emissions from some other emission units at the facility because those other units will run more days, or will run more on some days than they currently do. Should the increased annual emissions from those other emission units be included in the visibility impacts?
A No.
Q And why not?
A I have no evidence from my limited review that they actually change the 24-hour emission rate from the facility or from these units that run just more hours of the day.
Q So in his testimony on Monday, Mr. Gebhart said that under the FLAG guidance, a modified unit is the same as an affected unit. Does that make sense to you?
A No, it doesn't, because a modified unit has to meet the definitional criteria to be modified.
MS. BENNETT: Objection. That's a mischaracterization of Mr. Gebhart's testimony. He stated that that, one, FLAG does not provide a description of an affected or modified unit, and he did not say that they are the same, he said that there is no description, and so that is not a correct statement that

you are masquerading as Mr. Gebhart's testimony.

MR. WISE: Ms. Shirey, any response?

MS. SHIREY: I can say that's what I wrote in my notes and that's what I understood him to say was that basically under FLAG, the two are treated the same way.

MS. BENNETT: That's a different --

MR. WISE: Why don't you just ask Mr. Newman his opinion on that.

Q (By Ms. Shirey): So what is your opinion on modified units and affected units under FLAG, are they treated the same or not?

A For visibility analysis, my personal opinion, they should not be treated the same.

Q Thank you. So I want to turn to -- I think I want to go now to the BACT analysis questions. In your career, have you done BACT analyses for PSD permits?

A Yes.

Q Any idea how many?

A Like I said, I've done three personally and I have overseen probably another 15, 18 over the years.

Q When you do a BACT analysis, do you review the cost effectiveness analysis?

A Yes.

Q And when you're looking at a cost effectiveness

analysis, do you look at the costs to see if they look reasonable?

A Yes.

Q Have you ever gone back to an applicant and questioned the costs?

A Yes.

Q So you really are looking to see -- so you have found costs on occasion that looked excessive to you?

A Yes.

Q And gone back to the applicant?

A Gone back to the applicant, challenged the applicant and they've changed, or we changed it for them.

Q So in this case, Ecology rejected selective catalytic reduction as BACT for the coker heaters in the BP project as not cost effective.

A That's my understanding.

Q So in paragraph 34 of his prefiled testimony, Dr. Sahu says Ecology should have looked harder at the costs borne by other facilities that have installed selective catalytic reduction to control emissions from coker heaters. What does a permitting authority need to consider when other facilities have installed a particular emission control technology as BACT?

A If it's installed as BACT, then we have to look at what did it cost them in a cost effectiveness, what did that

state decide this source could bear as a reasonable cost, how that relates to other costs that have been borne by other people installing the control, knowing that the cost of installation of a particular emission control will vary between types of sources and even between emission units within a given source.

Q So you do look at costs at other facilities --

A Yes.

Q -- when an emissions control technology has been required as BACT at another source.

A (Nods head affirmatively).

Q Might a facility employ a particular control technology if not required to use it as BACT?

A Yes.

Q Why?

A In some cases, and I know very well, that people will install a control simply to avoid the time and process overhead of the PSD permitting process.

Q Any other reasons?

A Sometimes they will do it to avoid having to go through non-attainment new source review.

Q Okay. And I imagine there are other reasons.

A Each company has a whole variety of reasons why they might choose to do something that might not -- that their competitor might think is not in my best business

interest for you to do that.
Q So in paragraph 41 of Dr. Sahu's prefiled testimony, he says the use of selective catalytic reduction to avoid PSD carries with it the presumption that SCR is cost effective. Do you agree with that?
A No.
Q Why not?
A Why not? As I said, it carries forward the presumption that the company involved decided that the cost of installing SCR was less expensive and less trouble than going through the permitting process that they would otherwise have to go through. So just the overhead of the PSD permitting process often causes people to put on emission controls simply to avoid the delays of the process.
Q So in paragraph 45 of his prefiled testimony, Dr. Sahu states that avoiding BACT particularly is the major reason sources try to avoid PSD. Do you agree with that?
A No.
Q Why not?
A In my experience, people avoid PSD to avoid the process and the time and cost of the PSD process itself, not necessarily to avoid installing BACT. Under Washington State law, they still have to install BACT because the

control that they would install as a non-PSD source, modification or new source, still is required to meet BACT, meeting the same definition as the federal one.

Q So I think what you're saying is that in Washington State, minor sources that are not major for PSD still have to use BACT, is that --

A That is correct.

Q And are there still sources in Washington that try to avoid PSD?

A Yeah.

Q Okay. So in paragraph 47 of his prefiled testimony, Dr. Sahu says BP must have found the use of SCR, selective catalytic reduction, on the coker heaters at its Whiting facility cost effective even though it's required in the consent decree. Do you agree with that?

A I do not agree with that.

Q And why not?

A In the context of a consent decree with EPA, it's also an enforcement action, and my experience with EPA in enforcement actions and consent decrees is cost effectiveness has nothing to do with what gets put into it. It's more like what extortion can EPA get out of the source to reduce emissions.

Q All right.

A Sorry. Sometimes I can be blunt.

Q In paragraph 48 of his prefiled testimony, Dr. Sahu says you still need to look at costs at facilities that installed SCR to meet LAER requirements, and what it LAER?

A LAER is lowest achievable emission rate. It's required of new emission units and modified emission units that exist in non-attainment areas and applies to the pollutant or pollutants for which there is non-attainment.

Q So do you agree that in evaluating BACT and looking at other sources, you need to look at costs at facilities that install SCR as LAER?

A I have found, except for California, you can't find cost effectiveness information for LAER installations.

Q So have you found cost effectiveness --

A Only in California, because they have it in their clearing house as part of the information. In California, LAER is called BACT and it's a creature of California state law.

Q And now I'm confused.

A Okay, sorry. So it is possible to find information on LAER cost effectiveness; however, it's not used in the decision of a LAER emission limit or whether a control is appropriately or to be installed under LAER.

Q So if I understand what's going on in California, they

use a standard in attainment areas that they call BACT, but it really is LAER?

A Yes. They also use the same standard in their non-attainment areas.

Q Right.

A And definitionally, it's identical to EPA's definition of LAER.

Q And so when you're looking for LAER determinations in California for facilities in non-attainment areas, would you expect to find a cost effectiveness --

A I would expect to find a cost analysis. California air districts do have cost effectiveness analysis and information.

Q Okay, but not for other states?

A Not other states.

Q Okay. So what does a permitting authority need to consider when other facilities have used an emission control technology but for purposes other than BACT?

A Repeat that, please.

Q If you're looking at a particular technology and you're considering whether to require it as BACT in a particular permit application, and you want to look at other facilities, but the other facilities that you are looking at didn't require it as BACT, they may have used SCR, but they didn't require it as BACT, what do you

need to look at at those facilities?
A Well, first off, their use of the control makes it an available control so it meets the step 1 criteria of being an available control under the BACT process. You may make phone calls to the local authority to see if there is information on costs that may have been provided. My experience has found it's probably not there. It does show up at -- certain agencies will have it, it will have been provided by the company for some reason.
Q Does EPA's 1990 BACT guidance provide anything on this?
A I believe so, but my memory is not exactly fresh on it.
Q Could you turn to Joint Exhibit 12.
A Okay. What page?
Q Page B.45.
A All right.
MS. SHIREY: And for the board, that has a JE number if you would like, but if you're all there --
MS. MARCHIORO: Please.
MS. SHIREY: JE001343.
Q (By Ms. Shirey): So I think starting the second line of page B.45, could you read that first sentence.
A "This may occur, for example, where a control alternative has not been required as (BACT or its

application as BACT has been extremely limited) and there is a clear demarcation between recent BACT control costs in that source category and the control costs for sources in that source category which have been driven by other constraining factors (e.g., need to meet a PSD increment or NAAQS)."

Q And what is a NAAQS?

A National ambient air quality standard.

Q And are sources required to meet the national ambient air quality standards?

A All sources or emissions have to meet the national ambient -- cannot cause or contribute to an exceedance of a national ambient air quality standard.

Q In the next paragraph, can you find the sentence that begins "Specifically."

A Yes.

Q Could you read that?

A "Specifically, the applicant should document that the cost to the applicant of the control alternative is significantly beyond the range of recent costs normally associated with BACT for the type of facility (or BACT control costs in general) for the pollutant."

Q So what this is saying, I believe, is that if you're looking at a technology that has not been required as BACT or has rarely been required as BACT, in a similar

situation, you look at whether the cost of the technology is beyond the range of recent costs normally associated --

MS. BENNETT: Objection. Leading. She can ask what his opinion is.

MS. SHIREY: I'm just trying to summarize what he's just read.

MS. BENNETT: You can summarize what his opinion is of what he just read, but not what he just read; summarize his understanding.

MR. WISE: Ms. Shirey, just think about your questions and try to avoid leading if you can.

MS. SHIREY: Okay. I was just trying to kind of condense down those two pieces.

Q (By Ms. Shirey): So what is your understanding of what this guidance says about what to look at if a technology has not been used as BACT or has rarely been required as BACT?

A It allows you to be a little more thoughtful in whether or not this is an appropriate control technology. You might want to do a little additional analysis than you would otherwise do on a commonly utilized control.

Q Specifically, what are you supposed to look for in costs, in the question of cost?

A Compare what costs that other people have borne, other sources have borne in installing either this control that you're looking at or controls in general.
Q So you're looking at controls that have been used associated with BACT?
A Yeah, BACT controls, it could have been RACT analysis. They do exist. If you have information on a LAER installation, it could have been the cost that other sources incurred there.
Q So I believe it does say something about looking at the range of recent costs. Do you see that?
A Yes.
Q Normally associated with BACT?
A That's correct.
Q So do you know what the range of recent costs normally associated with BACT for nitrogen oxides is at Ecology?
A I know how it's migrated over the years. Today's value, I'd have to ask Mr. Crooks what we quote out.
Q I wonder if you could look at Ecology's Exhibit 9.
A Okay.
Q So do you recognize this document?
A I recognize this document.
Q Can you describe it?
A It's a compilation of recent NOx determinations done in Washington State. Principally, most of these have to do

with reciprocating engine installations.
Q So are these recent BACT determinations in Washington for NOx?
A These all date between 2011 and 2017.
Q Do you know who all helped prepare this document?
A I believe Mr. Huitsing compiled this page.
Q Okay. Do you know if he got help from anybody else at Ecology?
A No, I don't.
Q Okay. So what does page 1 show? You just were discussing it.
A Page 1 shows seven different facilities with technologies and the type of source -- a little information about what the type of source that was being looked at and the cost-per-ton analysis that came out of those, and whether or not that was accepted or rejected as BACT.
Q Do you know if this document shows all of the NOx BACT determinations for PSD projects in the past five years?
A I believe this is all of them that I am aware of in the last five years.
Q And then does it also show some other non-PSD sources?
A I believe the data centers are all non-PSD.
Q Okay. So what does the document show about costs that have been rejected for BACT for nitrogen oxides?

A That we have been rejecting costs that were as low as $11,600 as not cost effective for NOx.
Q And what does it show about costs that have been accepted?
A It shows we have no -- it doesn't have any information about costs that have been accepted. The table, the technologies all indicate these were the base capabilities of the emitting unit that was subject to permit.
Q So you may have already started answering my next question is why don't the technologies that were accepted have cost analyses associated with them?
A Because these were all what was proposed to be installed to meet standards, at the very least, meet NAAQS and Washington State Toxic Air Pollutant Standards.
Q So they were not required to do a cost analysis?
A No, no.
Q In paragraph 56 of his prefiled testimony, Dr. Sahu claims that EPA has considered $10,000 per ton to be acceptable cost for BACT since at least 2001. Does that mean that costs for BACT in Washington should have been $10,000 per ton since 2001?
A No, it doesn't, and there's context around that $10,000 value that's important to consider.
Q Tell me.

A The context is that number comes from a document of what EPA thought would be recommendation to states as they were reviewing PSD applications for facilities having -- oil refineries having to upgrade their facilities to meet tier 2 gasoline standards or further higher levels of gasoline sulfur-removal requirements.

Q And why is that important?

A It's important because it was EPA looking at it from a national scope, from their office in North Carolina, and it doesn't consider anything with local costs or local effects on sources.

Q So do states have different BACT thresholds than EPA?

A Yes. Local agencies can have different thresholds than the state's.

Q Could you turn to Ecology Exhibit 23?

A Okay.

Q Do you recognize this document?

A Yes, I do.

Q Can you just briefly say what it is.

A It's a letter that was written by EPA Region 8 to Mr. O'Clare of North Dakota related to some costs effectiveness analyses done by the state at the Milton Young Power Plant.

Q Could you turn to page 5 and 6.

A Starts on page 4.

Q Okay. So on the bottom of page 4, I believe it talks about -- what does that last bullet say?
A The last bullet is the reference to the EPA guidance that I mentioned earlier, the 2001 guidance on the low sulfur gasoline regulation.
Q That used the $10,000-per-ton cost effectiveness threshold?
A That's correct.
Q Okay. So on page 5, does it talk about state thresholds for BACT?
A There is some states that have numbers listed in here. California Air District's are listed as having cost effectiveness of 97 to $24,500 a ton. There is an air waste management meeting paper from 2002 which talks about Connecticut having a cost of $9,000. At the same time, Arkansas was a $5100 and Michigan was $22,000.
Q The second bullet point on that page, what does it say?
A And that has Nebraska, Utah, Alabama, Oklahoma each have stated costs below $5,000 per ton will be presumed cost effective.
Q So does EPA acknowledge here that states can have different cost effectiveness thresholds?
A Yes. They have to be acknowledging that because they're just showing how all of these various numbers exist in people's different states.

Q So turning back to Ecology Exhibit 9.
A Okay.
Q Turn to page 2 of that document. What does this show?
A And this shows cost thresholds that we have used at Ecology over the years.
Q Can you just run down those quickly.
A So in the '80s up through the early '90s, we used a threshold of $2,000 a ton.
Q So I want to stop you for a minute then. What did that apply to?
A And that applied to pretty much any BACT decision, major or minor, PSD or otherwise.
Q What pollutants?
A This was the number that was in place when I started and the staff applied it to all pollutants.
Q Including toxic pollutants?
A They did not apply it to toxic air pollutants because the air pollutant rule didn't exist until late '80s.
Q Okay. But it applied to all criteria pollutants?
A All the criteria pollutants, all the PSD-regulated pollutants at that time.
Q And I will just ask you what the criteria pollutants are for the benefit of the board.
A Criteria pollutants are -- the 1980 version or the today version?

Q Why don't we go with the today version.
A Okay. It's PM2.5, PM10, ozone, NOx, sulfur oxides, lead, and ozone.
Q You said ozone twice?
A Did I say it twice? There's six of them.
Q And what's the sixth? I always forget one, too. It's not fair. I can tell you what it is. Can I tell him what it is? The sixth one is carbon monoxide.
A Oh, well, that's because nobody cares anymore.
Q So going back to Ecology's Exhibit 9, what it shows on page 2, so 1980s, the cost was about $2,000 a ton?
A Yes.
Q And then what after that?
A Then after I started managing the program, we started growing the costs and reflecting what costs were being imposed by other states for RACT for PSD permitting purposes, and in that process, we were starting to see, as reflected in EPA's guidance, that there were differences both between pollutant and between the type of source emitting the pollutant on what was cost effective.
Q And so what were --
A So in the mid '90s we had $7,000 was the cost effectiveness for our CR applied to a gas combustion turbine, but it was less than $1,000 if it was SO2 for

an oil-fired boiler with heavy oil.

Q So there was a variety --

A A variety.

Q Okay. Was $7,000 per ton about the top?

A That was as expensive as we got. We discussed at various times what might be appropriate for toxic air pollutants, but we never even established even a rule of thumb.

Q So then the last discussion here is the costs that are considered acceptable now. What does that say?

A And that just says if a project comes in today, and this is what I would defer to Mr. Crooks on, costs below $5,000, you know, don't even ask, just do it. Costs between 5 and $10,000, we'll start getting our pencil out to see if there are errors in the analysis, especially the cost analysis or the tons removed analysis. And if it's over $10,000, then it's not considered a reasonable cost. And even that, those are probably not fixed numbers. They're probably -- if it's close to -- if it's 10,100, I would recommend getting your pencil out.

MR. WISE: Ms. Shirey, we're coming up on the noon hour. How much longer do you have on direct?

MS. SHIREY: I have a bit longer, but

I can finish this particular thing up pretty quickly.

MR. WISE: Okay. When you reach a stopping point.

Q (By Ms. Shirey): So in paragraph 57 of his prefiled testimony, Dr. Sahu claims that if $10,000 per ton was the proper threshold in 2001, inflation would bring that up to $14,000 per ton, so $14,000 per ton is the proper cost threshold for BACT now. So do you agree that $14,000 per ton should be considered cost effectiveness threshold for BACT in Washington now?

A Not in Washington. Might be someplace.

Q All right. So Dr. Sahu in his prefiled testimony used a formula to update the EPA's cost effectiveness value of $10,000 per ton to $14,000 per ton. That would have been paragraph 57. Does Ecology Exhibit 9, page 2, have anything to say about that?

A Yeah, it actually has that calculation shown for the $7,000 value using the same approach that he had in his prefiled testimony.

Q So when you say the $7,000 value, what is that?

A The $7,000 value from the 1990s to mid 2000s that Ecology would have used as a top end.

Q And so if you adjust that value for inflation, what do you come up with?

A Using the Engineering Compliance Cost Index isn't

exactly an inflation adjustment, but it reflects the change in the cost of materials and construction at a construction project of the nature of adding a boiler or SCR costs, but, yes, it says that that number would come up to just over $10,000 per ton removed.

MS. SHIREY: Okay. And that's a reasonable stopping place for us right now.

MR. WISE: Okay. Why don't we take a lunch break and come back at one o'clock and we'll finish up this direct.

(Recess from 12:00 p.m. to 1:00 p.m.)

MR. WISE: Do you want to continue with Mr. Newman's direct?

MS. SHIREY: Yes. And the first thing I would like to do is ask the board to admit Ecology Exhibit 9 and Ecology Exhibit 23, which I referred to a little bit ago.

MR. WISE: Nine and 23. Any objections?

MS. BENNETT: No, Your Honor.

MR. WISE: Thank you. Ecology Exhibits 9 and 23 are admitted.

(R-ECY-9 & R-ECY-23 admitted.)

Q (By Ms. Shirey): We left off with cost thresholds. So now I would like to turn to another aspect of a BACT

cost effectiveness analysis, which is the interest rate that a facility would use.

In paragraph 76 of his prefiled testimony, Dr. Sahu claims the proper interest rate BP should have used for BACT effectiveness is the actual interest rate BP paid. Do you agree with that?

A No.

Q And why not?

A The cost effectiveness analyses, in my history and training, has been to use a uniform 7 percent interest rate for all projects.

Q And who trained you to do that?

A I was trained to do that by Region 10 permitting staff.

Q Region 10?

A EPA Region 10 permitting staff who did the PSD permits and who we worked for as a delegated agency.

Q I am going to hand you a copy Dr. Sahu's prefiled testimony, if I may. Would you turn to page 35, paragraph 76.

A Okay.

Q Do you see where he talks about the interest rate to use?

A Yes.

Q And he cites to a footnote; is that right?

A Yes, Footnote 33.

Q Would you read Footnote 33.
A "For example, in Chapter 2 of its Control Cost Manual, EPA states that: 2.5.2 Interest Rates. Firms may borrow to finance the expenses associated with their compliance strategies. The interest rate at which a firm borrows is a key component in estimating the total costs of compliance. Financial markets set different interest rates for different activities depending on many factors. Because this manual is concerned with estimating private costs, the correct interest rate to use is the nominal interest rate which is the rate firms actually face. For permit applications, if firm-specific nominal interest rates are not available, then the bank prime rate can be an appropriate estimate for interest rates."
Q Thank you. Could you turn to Ecology Exhibit 19.
A Okay.
Q So what is this document?
A This appears to be a copy of all or part of, probably part of, the cost estimating section in Chapter 2 of Section 1 of EPA's Seventh Edition of the Cost Estimating Manual.
Q Could you turn to pages 14 and 15 in this document.
A Yes.
Q So the bottom of page 14 has a section on interest

rates. Could you read the first sentence there.
A First sentence under 2.5.2 reads, "Firms may borrow to finance the expenses associated with their compliance strategies."
Q And on the next page, do you see in the middle of the page where there is a formula that says "i" equals "ir" plus "p" to the "e"?
A Yes.
Q In the paragraph below that, could you read that little short paragraph.
A "When performing cost analysis, it is important to ensure that the correct interest rate is being used. Because this manual is concerned with estimating private costs, the correct interest rate to use is the nominal interest rate, which is the rate firms actually face. Accounting for inflation should be done separately rather than using the real interest rate."
Q Thank you. So with that in mind, could you go back to Dr. Sahu's prefiled testimony, Footnote 33.
A Yes.
Q So the language you just read, is that the quoted language in Footnote 33?
A There is an ellipsis in the middle of the quotation, which I'm not sure where -- it connects to something which is outside of what I just read.

Q Right, but the words that are there --
A Up through the ellipsis.
Q Okay.
A The second ellipsis in the paragraph.
MS. BENNETT: Objection. Dr. Sahu's testimony can stand for itself.
MS. SHIREY: Dr. Sahu, when I asked him where this came from, this quote in the cost manual in his prefiled testimony, he wasn't able to tell me where it came from, and I'm trying to establish where it comes from.
MR. WISE: Objection overruled.
Q (By Ms. Shirey): So when I asked Dr. Sahu if this was the document he was quoting from, this Chapter 2 that you just quoted from, he said it might have been, but that the language might also have come from the Sixth Edition of EPA's Cost Manual, and so I wonder if you could turn to Ecology Exhibit 15.
A Okay.
Q So what is this document?
A First page is the cover sheet for the Sixth Edition of the Control Cost Manual by EPA.
Q EPA's Air Pollution Control Cost Manual?
A Yes.
Q What's the date?

A January 2002.
Q So do you know if this document contains the language in Dr. Sahu's Footnote 33?
A It does not.
Q Thank you.
MS. SHIREY: I would ask the board to admit Ecology Exhibit 19 and Exhibit 15 into evidence.
MR. WISE: Any objections?
MS. BENNETT: No, Your Honor.
MR. WISE: Ecology Exhibits 19 and 15 are admitted.
(R-ECY-19 & R-ECY-15 admitted.)
Q (By Ms. Shirey): Would you turn to in Ecology Exhibit 15 to page 2-13.
A Okay.
Q And in the middle of the page, the last sentence of the first full paragraph, could you read what that says about interest rates.
A This is the last sentence of the first full paragraph. "Also, since a change in the general level of prices affects everyone simultaneously, social rates of interest do not account for inflation. OMB sets the social interest rate for governmental analyses, and it is currently set at seven percent."
Q And then in the next paragraph, I think it's the third

line down, starts with "However."

A Okay. "However, the social rate of interest is probably not appropriate for industry."

Q Thank you. So is this second sentence about the social rate, which at this point was 7 percent, not appropriate for industry, is that consistent with your experience in what you've been taught about what interest rate to use?

A No, it is not consistent with my instructions and training.

Q So what have you been taught?

A What I've been taught is to use a 7 percent interest rate as not just a default but as the rate to do cost effectiveness analyses.

Q Why is that?

A It allows inter-comparability between different sources on the same controls. And it does not allow a source to skew a cost effectiveness analysis by using different emission rates as their cost of money.

Q So what happens if the interest rate at the source that the applicant has, their actual interest rate is higher than 7 percent?

A We have said to use 7 percent. In fact, if they were to use 7 percent, it would raise all of their costs and make what otherwise might be a cost effective control non-cost effective.

Q You mean if they use --
A Use a higher interest rate.
Q So the approach that Dr. Sahu cites to in the latest EPA guidance, does this represent a new guidance to you?
A Yes, it does.
Q Do you know why EPA is changing its approach?
A No. I did not read any background documents that would tell me why they made the change.
Q Can you outline any problems that could occur with this approach?
A Well, the largest problem is that you can't compare the cost of the control on the same emission unit between different companies or even the -- it's different facilities owned by the same company that are in different states.
Q So I want to turn back to Ecology Exhibit 19. What is the date on this document?
A November 2017.
Q The permit for the coker heater project was issued on May 23, 2017. Would this new guidance have applied to that document?
A It wouldn't have been final chapter or guidance at that time.
Q So would it have applied?
A Would not have applied.

Q The next issue I want to touch on is the contingency factor that BP used in its cost effectiveness analysis. Are you familiar with contingency factor?
A Yes, I am.
Q So BP used a contingency factor for BACT for both nitrogen oxide and SO2, they used a project contingency factor of 15 percent. In paragraph 78 of his prefiled testimony, Dr. Sahu says the contingency factor should have been more like 5 percent. Do you agree?
A No, I don't agree for the level of the estimate, the quality of the estimate that I believe was actually prepared for the project.
Q So can you talk about the estimating process and what contingency factors make sense?
A So estimates are done at various points during the development of a project. They range from nearly order of magnitude costs as a company starts evaluating the project, and then there is a planning level cost that is says this is what we want to do and this is what the parts are. That might be as accurate as plus or minus 50 percent. And then as you move towards getting authorizations, you get better quality estimates. By the time you actually are embarking on design, you've got an estimate that might be accurate to 20 to 30 percent. That's the point at which you're now preparing

construction drawings and everything. And then when you get at the end of construction drawings, the engineer firm doing that work might get to an accuracy of as close as 5 or 10 percent.

So that's all reflecting the quality of the information that's been acquired, the knowledge of material needs, the knowledge of sub foundation requirements. In the air pollution world, it's the knowledge of what will actually be my BACT emission requirements and what are the limits and what does that equipment actually entail.

Q So when a facility submits a permit application with a BACT determination, at what stage in that process is that; how far along in the estimating process is that?

A I characterize it and have had it characterized to me is it's that zone between I'm done with the planning, I've got approval, but I'm not yet into formal design. So it's probably plus or minus 30 percent.

Q And BP used 15 percent, so was that reasonable in this case?

A Fifteen percent is not an unreasonable contingency to cover unknowns, which can include the actual cost of materials when you actually go to bid.

Q Does EPA have any guidance on contingency factors?

A I don't remember reading any. They may have it; I don't

remember reading any.
Q Okay. I want to go to Ecology Exhibit 15 again.
A Okay.
Q This is EPA's Sixth Edition of its Cost Control Manual. Turn to page 2-44.
A Okay.
Q Table 2.5, what is that table?
A Table 2.5 looks like a short version of an example cost analysis for determining total capital investment.
Q And what is the technology being talked about here?
A The particular technology is SCR.
Q And what does this have for project contingency?
A And this uses a project contingency of 15 percent.
Q Do you know what project contingency is?
A Project contingency is all of the variables related to getting the project built, like I said, sub foundation, sub soil issues, overhead infringements that you don't understand before you get into design, and the cost of raw material to build it is going to vary over time.
Q Could you turn to Exhibit R-24. It's in BP's binder.
A Twenty-four?
Q Twenty-four.
A Okay.
Q Do you recognize this document?
A Yeah, this is the May 2016 version of the SCR chapter

from the Control Cost Manual.
Q So is this the same Control Cost Manual that we've been looking at?
A This is the May 16th version of the Seventh Edition version of this chapter.
Q Okay. And this chapter deals specifically with selective catalytic reduction?
A That's correct.
Q Could you turn to page 2-64.
A Okay.
Q And the Section 2.4.1, talking about total capital investment. Could you read the last sentence of that first paragraph?
A So this the first paragraph under 2.4.1, the last sentence. "The capital cost equations included in the manual reflect a process contingency of 5 to 10 percent and a project contingency of 15 percent."
Q Can you tell me what process contingency is?
A My always understanding of process contingency is it's the risk of the process to achieve its design requirements. So SCR being a relatively mature technology, the risk of it failing to meet a design requirement is fairly low.
Q I want to move on to change in a method of operation and when that is a modification and when it's not.

So the new coker heaters that BP is installing will be able to run longer between cleaning, which means the downstream units that burn coker off-gas will be able to run longer over the course of a year. You following that?

A (Nods head affirmatively).

Q NPCA claims the increased emissions from the downstream units made possible by the new coker heaters makes those downstream units modified units subject to BACT. Do you agree?

A No, I don't.

Q Why not?

A Those downstream units already are capable of burning that fuel stream and have been permitted to use that fuel stream in the past from the existing cokers.

Q Could you turn to Exhibit P-11. So that's in the smaller of those green books.

MS. BENNETT: Objection, Your Honor. Mr. Newman already testified to the fact that he does not have personal knowledge of the permit, he hasn't worked on the permit, so this line of questioning we should not be going down.

MR. WISE: Ms. Shirey.

MS. SHIREY: I'm asking Mr. Newman, as someone who has extensive experience in PSD permitting,

whether certain explained decisions or explained pathways in the permit are consistent with his experience.

MR. WISE: Objection overruled. I'll allow the question.

Q (By Ms. Shirey): So Exhibit P-11, do you recognize this document?

A Yes, I do.

Q What is this?

A This is an EPA guidance letter related to a project at the Puget Sound Refinery in Washington State.

Q Which Puget Sound refinery?

A That's the name of the refinery actually, but it's currently owned by Shell.

Q Okay. So do you know what project this is talking about?

A This was an old project that added a new delayed coker unit to the facility.

Q And when was that project?

A According to the first paragraph of the letter, that was 1983.

Q And what happened in 1983?

A In 1983, they built a brand-new never existing delayed coker unit and then routed the off-gasses of that to the flare system header.

Q EPA's decision on that question is at the bottom of page 2 of this document in the second and third sentences of the last paragraph. Could you read those two sentences?
A "Under NSPS subpart J, it is the agency's position that a physical change made at an upstream refinery process unit could result in an operational change to the flare as a result of additional fuel gas being released to the flare. Combusting gas streams not previously combusted in the flare is a change in how the flare operates whether these streams are routed on a routine or on an intermittent basis."
Q Okay. Now I'm wondering if you could turn to Ecology Exhibit R-20.
A R-20. Okay.
Q Do you recognize this document?
A Yes. It's operating permit statement of basis for Shell Puget Sound Refinery.
Q And if you turn to page 51 in this document.
A Yes.
Q It describes the construction history and regulatory applicability, I believe.
A Yes, it does.
Q And what does that first paragraph say?
A You want me to read it?
Q Well, if you could just state it.

A "Shortly, the delayed coking unit was constructed in 1984 under a Northwest Clean Air-issued permit that was issued in 1983. It was revised at a later date."
Q So is this the project that was being discussed in EPA's guidance letter that we just read?
A I believe this is the same project.
Q Okay. Is this similar to what's going on at, as far as you know, as what's going on at the BP facility?
A No.
Q And why not?
A This was a brand-new coker unit at a facility that had not had a coker unit before.

MS. SHIREY: I would ask the board to admit Ecology Exhibit 20.

MR. WISE: Any objections?

MS. BENNETT: No, Your Honor.

MR. WISE: Ecology Exhibit Number 20 is admitted.

(R-ECY-20 admitted.)

Q (By Ms. Shirey): I wonder if you could turn to Exhibit 22, Ecology Exhibit 22.
A Okay.
Q Do you recognize this document?
A Yes, I do.
Q What is it?

A It's an EPA guidance letter from EPA headquarters to EPA Region 10 regarding a PSD permit applicability question for a pulp mill in Washington State.
Q Do you know what that project entailed?
A Yeah, it -- let me read this. The company was proposing to install a pulp-bleaching plant and a larger digester for the mill.
Q And what kind of emissions increase would that cause?
A It could cause carbon monoxide emissions, it could cause emission increases at the recovery furnace from getting more black liquor.
Q Recovery furnace?
A Yeah, recovery furnace, recovery boiler.
Q Okay. So I wonder if you could read the third sentence in that first paragraph.
A "While the construction of these units does not by itself cause increased emissions, emissions from the recovery boiler as a result of this construction activity will increase above the significance levels but remain below the maximum design permit levels."
Q And EPA's decision on this particular question was -- that is the next-to-the-last paragraph on page 3 of this document. What did EPA decide here?
A EPA concluded "Since the recovery boiler will not be undergoing a physical change or change in the method of

operation, it will not have to apply BACT. However, the emission increases have to go through air quality analyses and will consume air quality increments."

Q Could you -- if you don't know, say I don't know, but if you do know, could you describe how the situation in this letter is similar to the situation with the BP coker units?

A Based on the information I've heard here and in my discussions with the permitting staff, this looks exactly like the project in regards to what we call affected units in this permit.

Q And why is that?

A Because the units are only increasing their utilization potentially or increasing an existing fuel; they're not being physically modified or operationally modified.

Q Could you turn back to 22 for just a second. What is the date on Exhibit 22?

A The date on Exhibit 22 is July 28, 1983.

Q Okay. So now go back to Exhibit 21. And what is the date on that document?

A February 8, 2000.

Q So do you know what this letter is, what this document is?

A This is another letter asking about dealing with PSD applicability for the bottleneck sources and has a

number of scenarios they're investigating.
Q So if you turn to the second page of this document, there is an indented quoted paragraph in the middle of that page. Do you see that?
A Yes.
Q Do you know where that paragraph came from?
A The text just ahead of it says it came from the 1983 letter from EPA Headquarters to Michael Johnson of EPA Region 10 that's referenced in 22.
Q That is the one, that Ecology Exhibit 22.
A Yes.
Q And can you read the first sentence of that quoted piece.
A "Since the recovery boiler could not have operated at a level higher than that provided by the existing digester capacity, any increase in actual emissions at the recovery boiler, which will result from the increased capacity provided by the larger digester, must be considered for the purposes of PSD applicability."
Q And then go on.
A "Since the recovery boiler itself will not be undergoing a physical change or change in the method of operation, it will not have to apply best available control technology."
Q Thank you.

MS. SHIREY: I would ask to admit Ecology Exhibits 21 and 22.

MR. WISE: Any objection?

MS. BENNETT: Your Honor, I object to Exhibit 22.

MR. WISE: What's your objection to 22?

MS. BENNETT: It lacks foundation. It appears that Mr. Newman has not had the level of familiarity with this document and actually has been reading this document while he is on the stand.

Q (By Ms. Shirey): So I would ask, Mr. Newman, are you familiar with this document?

A I have seen it before and read it before.

Q You've read it before. Thank you.

MR. WISE: Mr. Newman is an expert and he's been presented with facts and asked for his opinion. I don't have any problem with that. So I'll overrule the objection.

MS. SHIREY: So I ask to admit Ecology Exhibits 21 and 22.

MR. WISE: Ecology Exhibits 21 and 22 are admitted.

(R-ECY-21 & R-ECY-22 admitted.)

Q (By Ms. Shirey): So I have one last or couple of

questions. There's been some discussion in this case about affected units versus modified units. Can you describe what these two terms mean?

A Well, modified unit is, definitionally, it's an emission unit that's physically or operationally modified that results in emissions increase as a result of an operational modification.

An affected unit, which also can go by the term debottleneck, is an emission unit that has an emission increase as the result of another project but for which it is not modified or has a change in its method of operation.

Q Is that an important distinction in air permitting?

A It is a very important distinction in air permitting. It helps define what emission units are subject to BACT and which ones are simply subject to ambient air quality analysis.

Q Thank you. I have no further questions.

MR. WISE: Okay. Ms. Bennett, cross exam? I'm sorry, any more direct questions?

MS. POWER: No, thank you.

CROSS EXAMINATION

BY MS. BENNETT:

Q Good afternoon, Mr. Newman.

A Hello.
Q You testified that you're familiar with FLAG guidance, correct?
A I've used FLAG guidance and read it over the years.
Q And you say you have familiarity with this project?
A I have a rudimentary familiarity with the project from my proximity to the permitting staff and having been asked questions over time.
Q Given that rudimentary familiarity that you're stating, isn't it correct that Ecology has not received any formal communication from the Park Service or the Department of Interior after the finding of adverse impact concerning this project?
A I'm not aware of any communication.
Q That includes withdrawing adverse impact finding as well?
A I have not seen any evidence that that finding has been withdrawn.
Q Given your level of familiarity with the project, has the Park Service alerted Ecology that it had concerns with EPA's modeling analysis in the Sumner of 2016?
A I was aware that through, like I said, my proximity to the permitting staff, I was aware that it had come up and that there were issues.
Q Is it your position that if BP is affecting haze after

this project, you will require controls to address that, you will require controls from BP to address that?

A BP will be evaluated, as other sources will, for whether there are available and appropriate controls that can be installed, and, if so, they will be required as part of the regional haze for reasonable progress goal for 2028. I cannot give you an answer there will be a reduction.

Q Based on what information?

A Based on the analysis has not been started or completed.

Q Does that include pollution controls that are equivalent to BACT as we are discussing here?

A Those are the kind of controls that would be evaluated.

Q Regional haze provisions don't address deposition, right?

A That is correct.

Q When you mentioned earlier that all the BART sources would fail the Q/d test, that included BP, correct?

A That is correct.

Q Mr. Newman, could you please turn to tab 9 in Ecology's exhibits.

A Yes.

Q Mr. Newman, did you prepare this?

A No, I did not.

Q So is your testimony based on you reading this information, or reading from it?

A I helped prepare it; I did not prepare it. My work was principally on page 2.
Q Based on your knowledge of the project, is the 10,000 threshold what Ecology applied in this case?
A I believe that's what the permitting staff applied. I would have to reread the support documents to determine that for sure.
Q Mr. Newman, could you please reference Ecology Exhibit 23, page 4.
A Yes.
Q On that page, EPA notes in 2001 dollars, correct, in that footnote, or in that bullet point, excuse me?
A The document was dated in 2001, and I do not remember that the document actually stated what year dollars those were, and they may have been 2000 or 1999.
Q Mr. Newman, are we looking at the same document, page 4?
A You said Ecology Exhibit 23.
Q Yes, page 4. And it says --
A It says in 2001, excuse me.
Q The next line, "This guidance used a cost effectiveness threshold of $10,000 per ton of NOx controlled in 2001 dollars."
A Yes, I agree. I misread the bullet.
Q I would like you to then please turn to page 6. Please reference the middle of the document. EPA advises that

states must consider inflation, right?
A I have not seen any EPA document that advises we must consider inflation.
Q Even the letter that sits right before you?
A Even though that sits right before me. I have not been advised by EPA of that. I don't read every EAB appeal decision.
Q When is the last time that you were advised by EPA about that?
A I don't believe I've ever been advised by EPA on inflating costs.
Q With that said, where does your knowledge then come from about that?
A About what?
Q About the inflation.
A Because I've never been advised --
Q No.
A -- of that knowledge?
Q Yes. You're saying that you have never been advised and so you don't do anything beyond that. So do you ever look beyond the scope of just being specifically directed by EPA, I mean, do you look at --
MS. SHIREY: That's kind of a vague question. I wonder if you could rephrase the question.
MR. WISE: I think I'd let her finish

the question.

MS. SHIREY: Sorry. I thought she was done.

MS. BENNETT: I'll withdraw the question.

Q (By Ms. Bennett): You determined earlier in your haze plan work that BP adversely affects the parks, correct?

A Yes.

Q And based on that rudimentary understanding of the project, will this project increase emissions from BP?

A Yes.

Q Do you know what emissions data BP has supplied the Park Service?

A No.

Q Do you know what emissions data BP has supplied Ecology?

A They supplied Ecology what was in the application.

Q So are you aware of the fact that BP did not provide either hourly or 24-hour emissions data to the Park Service?

A I'm not aware that they did or did not.

Q Are you aware of the fact that BP did not provide either hourly or 24-hour emissions data to Ecology?

A If that's what was in the application, that's what was in the application. I did not go through the pages of the application; it was not part of my job.

Q But you did say you were familiar with --
A I'm familiar with it on general terms. I am not a detailed reviewer of the permit. It's not mine to evaluate.
Q You testified that process delays in permitting can be undesirable for time and cost to the company, correct?
A What was the first --
Q You testified that process delays in permitting can be undesirable for time and cost?
A Yes, I did.
Q Time is a financial consideration, correct?
A Yes.
Q Delays in business is also a financial consideration?
A It's a business decision people make.
Q So a company might install BACT-level controls to save that time and cost, correct?
A They might install LAER-level controls to avoid it.
Q They would not install BACT?
A They might install LAER, not just BACT.
Q So both?
A Either.
Q You testified consent decree is extortion.
A Every consent decree that I have been involved with from EPA is some form of EPA owns the -- EPA has the source in their sights and the source doesn't have lots of

wiggle room. EPA usually dictates the control technologies that get installed.

Q I want you to refer to Ecology tab 8, page 22.

A Report page 22?

Q Yes.

A Okay. Just checking.

Q Mr. Newman, could you please refer to NOx and stationary sources in that.

A Yes.

Q Is th eCherry Point Refinery one of those sources?

A Yes, it is.

Q Can I please point you to the 2011 number and ask you how much of that was from Bp's Cherry Point Refinery?

A Not without the spreadsheets that are behind this.

Q Could I have you reference the chart on page 15, the bar graph for BP Cherry Point Refinery.

A Yes.

Q So based on that chart, in 2011, NOx was at 2,000 tons per year, correct? That's page 15.

A Yes. So which year?

Q 2011.

A 2011 would have been 2,000 tons, yes. Sorry, I may have written it all; I forget all the details.

Q No problem. Understandable. Based on that chart, they have been near that level for the last several years,

correct?

A They've been decreasing emissions over the last several years, but, yes, they're still above 1500 tons.

Q So I would like to refer you back to page 22.

A Mm-hmm.

Q Based on the chart on page 15 and the data from 2011, in 2011, BP was roughly 10 percent of all stationary sources, correct?

A Looks to me like it's probably closer to 9 percent, but in that range.

Q Give or take. And if you compare the tables on page 23 and page 15, you show again that BP is roughly 10 percent of sulfur from the stationary sources, correct?

A Yes.

Q Thank you.

MS. BENNETT: Nothing further, Your Honor.

MR. WISE: Thank you. Any further cross?

MS. POWER: I have one redirect question if I may, if that's all right.

MR. WISE: All right. You can start redirect.

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REDIRECT EXAMINATION

BY MS. POWER:

Q Mr. Newman, just following up on the last line of questioning, you were asked about the role of BP essentially with respect to its emissions, and I just want to clarify both with respect to that last line of questioning as well as with respect to your answer regarding BP and other BART sources failing Q/d previously, is that with respect to the entire refinery or with respect to the coker heater project at issue in this case?

A The entire refinery.

Q Okay. So it is not specific to any emissions related to the coker heater; is that right?

A That is correct.

MR. WISE: No other redirect?

MS. SHIREY: I have nothing.

MR. WISE: Board questions.

EXAMINATION

BY MS. MARCHIORO:

Q In terms of regional haze and the 2064 term, something I am really looking forward to, you were asked about tools and various things that you would be looking at. I am curious, what is enforceable? What is it you could do?

My understanding of these air permits and one of the reasons why there is a lot of concern when they're issued is it's not like an NPDES permit that comes in every five years for tuning up and ratcheting down. So what tools do you have that are enforceable that can actually make a change at a facility? We're not going to talk specifically about BP Cherry Point.

A The RACT process is probably the best tool that we have in our tool box.

Q What triggers RACT?

A One of the things that can trigger RACT is a federal requirement. Other things are ambient air quality problem that's attributable to the source. There's five different things that I can't remember what they all are right off.

Q So an ambient air quality problem that's attributable to the source means it would have a degradation of air quality?

A Yes.

Q So let's say it's a degradation of air quality. When you go in and do that RACT analysis, is it specifically limited to that particular air quality problem or is it a fresh look at the entire facility?

A I would say as the agency, it's a fresh look at the emissions from the facility that affect the problem.

The companies will often say it's only to the extent of the pollutants that affect the problem. The RACT process has a step in which we have to identify the pollutants of concern that are being addressed, and that's where we look at what are the pollutants that we have to deal with, which may be beyond just the narrowest of what's the ambient air quality problem that we're addressing, as it may be the only opportunity we get to do anything to the plant for a very long time.

Q Is that one of those points that is hotly debated between the regulated community and the regulator?

A Very hot.

Q And you're not in EPA so you don't feel like you've got the big stick?

A I don't have an EPA stick in my pocket.

Q I want to ask you a little bit about BACT and Ecology's Exhibit 9, which was the chart.

A Yeah.

Q I'm just trying to get a sense of --

MR. WISE: Do you have the number on that exhibit?

MS. MARCHIORO: Exhibit 9, Ecology 9.

Q (By Ms. Marchioro): So you have these different numbers. I know you helped, but didn't prepare this, but I'm just trying to understand. And there is a

$10,000 figure that's been discussed as the threshold here. When you have these times when folks are either voluntarily putting in, let's say it's an SCR, they're voluntarily putting it in or it's what is appropriate for the unit, I thought you said, and you're not calculating any costs, so how do you ever get yourself with enough information to get a better handle on what the true cost is or what is a more appropriate, I would say, BACT economic cost, because it seems to me every time people do it and you don't take the cost information, you're losing an opportunity to fine tune your number.

A Right.

Q And so what do you do about that?

A That's where we have to look at what's going on in other states, so that's the comparative costs that other facilities are incurring for installation of controls.

Q So we looked at that footnote that had all those different costs, I can't remember which document it was, and we had the low end of $5,000 in the midwestern states, I recall, and then there were some that were up to 24,000. So how do you then not look at those and say -- do you do an average or what do you do with that and say maybe 10,000 is a little light?

A Well, a lot of it is looking at so what are they doing,

how much controls do they already have in their state, what's the sources they are looking at, because the cost effectiveness can vary by source, not just by pollutant. So it requires more than just looking at, well, that's the range that's been used so what have you been applying it to and how many of these do you actually get, or is this just like is my state policy is that's the number, therefore, if you're below that, that's what you do. We've never established a state policy in that way. We've always looked at what's the comparable cost of other people.

Q Okay. Let me ask you about cost estimates that you get in the BACT analysis. So let's say the cost estimates are enough above your threshold that you have either got your pencil out or it's not -- I'll start with the other direction. Let's say you're just below your threshold, and within a certain period of time and let's say that the, I saw this in one of documents that makes it possible, is that occurrences, let's say steel just for whatever reason, tariffs or otherwise, it goes up, the cost of steel goes up. Can a company come in after you've made a BACT determination and say, hey, wait a minute, we've now gone from $9,500 per ton to $13,000 per ton; therefore, we're above your threshold, we can't do BACT?

A I can't recall anybody ever asking that form of the question. So this is going to be more conjecture than real, but this is the approach. First off, if a permit has been issued, BACT has been established, costs went up, it's kind of tough. If the permit hasn't been issued, there may be grounds to go and re-evaluate BACT at that point, but it's going to be a re-evaluation based on the new condition, it won't be, oh, costs went up, we can't do it anymore.

Q So the same would be true if costs went down. Once you have given someone the opportunity not to install BACT, you can't come back later and say, oh, by the way, your assumptions have been proven a little bit off, you fit and, therefore, you shall?

A That is correct.

Q And Ecology Exhibit 19, that's the brand-new excerpt from the Cost Manual; is that right?

A Yeah, 19 is the excerpt from the November edition.

Q So I want to talk to you a little bit about that interest rate. I'm just trying to understand if you've been instructed by EPA to always use 7 percent, why is EPA calling it a default rate then?

A I don't know other than it's the number. In this case, they portray it as it's the number to use if you don't have anything else, which makes it default.

Q And so I'm just curious about that anything else. Is there an effort made by Ecology to go out and look for anything else?
A Up until the advent of this manual, there has been no reason to go look for anything else.
Q Can you explain that a little bit further?
A Well, as I tried to explain earlier, until this, until November 17 when this final update of this, update to the Cost Manual chapter came out with the statement that you use other than 7 percent as the preferred interest rates for calculating capital recovery factor, not just the default but the answer is you always use 7 percent as they did in the fifth and sixth editions of the manual.
Q I'm going to have you look then at Exhibit Ecology's 15, and specifically at page 2-13. I'm probably confusing myself; at least I'm hopeful that you will fix that problem.
A Okay.
Q In the first full paragraph, it says OMB sets the social and interest rate for government analyses at 7 percent and then there have been -- prior to that there is a discussion of different social interest rate versus I think the other real interest rate. So the next paragraph goes on to talk about the social interest

rate, et cetera, and then you get to the end and the last sentence, and this is where I am getting confused, because it talks about EPA has this interest rate different from EPA's 7 percent, then there are these customized interest rates in each chapter of the manual. That's why I am getting confused, because it seems to me if there was a default, there wouldn't be these spreadsheets and things in their Cost Manual to come up with a different interest rate, so can you explain that.

A Okay, the spreadsheets referenced, in order to make the spreadsheet work for trial purposes, they have to have an interest rate installed so they put 7 percent into the spreadsheet so that the user then can vary that interest rate if they so choose. It's one of many variables that can be installed in the spreadsheets.

Q And the user in that instance is, for example, the Department of Ecology?

A That's correct.

Q So there is some authority there, if you had chosen, to adjust the interest rate?

A That is correct.

Q Okay. Thanks very much.

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EXAMINATION

BY MR. WISE:

Q You mentioned RACT, R-A-C-T I am assuming. Could you tell me more about that.

A Reasonably available control technology is a provision in Washington State Clean Air Act that allows the Department of Ecology to require modifications in addition to emission controls on sources in the state. It directs the methodologies so that if there are two industries in a source category or fewer, we can do it by individual to the source. If there are three or more, we have to do it by regulation, and provide some outline -- it's a criteria by which we can use to require as a threshold requirement to go into the process.

Q Okay. Thank you.

Ms. Brown.

EXAMINATION

BY MS. BROWN:

Q I'm still curious about the cost effectiveness threshold and how that's established by Ecology. I think you said at one point that there's no state policy, and my understanding is there's no state rule that sets the cost effectiveness threshold.

A That is correct.
Q So who in Ecology sets it, how -- what's the process there? Do you just look at each application and decide, okay, for this app, it's going to be this level; how do you do that?
A I hate to say it, it's not a lot different than we look at each permit on its own merits and make a decision. We have rules of thumb that we have developed over time, as mentioned in the one exhibit, that used to be $2,000 a ton. During my tenure of supervising the unit, that grew to 4 to $7,000, depending on pollutant to the source. Since I left being supervisor, it's continued to grow. It's been reflecting costs that we're seeing in Washington and costs that these sources are incurring in other states for the installing of the various control technologies.
Q So then industry doesn't know what that number is?
A They won't know that any better ahead of time, no. They might know this is what it was last time.
Q Okay. All right. Thank you.

MR. WISE: Ms. Bennett, any follow-up questions?

MS. BENNETT: Yes, Your Honor, just a few.

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FURTHER EXAMINATION

BY MS. BENNETT:

Q You mentioned RACT in your testimony to both Judge Marchioro as well as Judge Wise, correct?

A Yes.

Q That's Reasonable Available Control Technology, correct?

A That is correct.

Q That's not as stringent as BACT, right?

A No, it is not.

Q BACT is best achievable control technology, correct?

A Best available control technology?

Q Best available. Excuse my error.

A Yes.

Q Thank you.

MR. WISE: Any other follow-up questions?

Ms. Shirey.

MS. SHIREY: Just a couple.

FURTHER EXAMINATION

BY MS. SHIREY:

Q So you mentioned or you were just asked that RACT is one of the tools you have to meet the reasonable progress goals under the regional haze program. Is that the only tool?

A Like I mentioned, it is the best tool in my tool box. I also have the ability, I believe, to use EPA's four factor process in order to do the evaluations and establish limits.

Q Is that four factor process established somewhere in EPA regulations?

A It's in EPA regulation and it's part of the Clean Air Act.

Q Okay. And getting to the question of interest rates, have you ever asked EPA if you could use a different interest rate in a BACT cost effectiveness evaluation, or had a source ask EPA if they could use a different interest rate?

A It did come up at least once while I was supervising the permit unit, and the company wanted to use a much higher interest rate because that was their actual cost of money, and EPA said no, use 7.

Q Thank you.

MR. WISE: Ms. Power, any follow-up?

MS. POWER: Nothing. Thank you.

MR. WISE: Thank you, Mr. Newman.

Ms. Shirey, do you have another witness?

MS. SHIREY: I do. Gary Huitsing.

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GARY HUITSING, having been first duly Sworn by the Certified Court Reporter, testified as follows:

DIRECT EXAMINATION

BY MS. SHIREY:

Q State your name and spell your last name for the record.

A Sure. My name is Gary Huitsing, G-A-R-Y, last name spelled H-U-I-T-S-I-N-G.

Q And where do you work at this point?

A I currently work at the Department of Ecology building in Lacey, Washington.

Q And what is your job there?

A I'm a permit and policy engineer for the air quality program.

Q Can you tell me something about your education?

A Sure. I used to be a teacher. I have a degree in secondary education. I went back to school and earned a degree in atmospheric science from the University of Washington and I stayed at the University of Washington and earned my master's in the civil engineering department. At the time they had an air resources division. Since then, they have changed the name of the department to civil and environmental engineering. And I have a master's of science in engineering from that

civil engineering department, air resources.
Q Are you a professional engineer in the state of Washington?
A Yes, I am, I obtained my license in 2006 and it's current as of today.
Q Could you turn to Ecology's Exhibit 1. It's that book right in front of you.
A Okay.
Q Do you recognize this document?
A Yes, I do.
Q Can you describe it.
A Sure. It's my resume'.
Q So I want to go down this a little bit and look at your experience. What kind of work have you done since you got your degree in engineering?
A Oh, I've been an environmental consultant since I got my degree. I also did some part-time air testing for air sampling companies. And then, of course, Department of Ecology.
Q So how long have you been doing air permitting work?
A Air-related work since approximately 2000, 2001 to the present. Off and on as a consultant. You usually get hired in a big air project and then the project is over and they'll throw you in some other media, ground water sediments, stormwater, until they get another air

contract and you're back on doing air again, but mostly air.

Q I see on here that you worked for Landau & Associates. What did you do at Landau?

A I started at Landau in 2003 and that's pretty much it. They had contracts for air-related projects and most of my time there was involved in air. Like I said, I deviated into other media also when work in air was low, but mostly air, preparing applications for different facilities, air permit applications for clients and submitted them to the Department of Ecology on behalf of a client.

Q Did you do any BACT analyses or did you work on BACT analyses in that job?

A Yes, I did.

Q And what was your role in those BACT analyses?

A I prepared the BACT analysis.

Q What kind of information would you get typically in order to prepare those analyses?

A Well, you're trying to get costs, you're trying to make sure the steps were done right, the top-down analysis, we call them 1 through 5. I identify and eliminate technically infeasible options, rank the rest and then evaluate the three, energy, environment, and economic impacts, and finally make a selection.

MS. SHIREY: I would ask the board to admit Ecology Exhibit 1 into evidence.

MR. WISE: Any objection?

MS. BRIMMER: No objection, Your Honor.

MR. WISE: Ecology Exhibit 1 is admitted.

(R-ECY-1 admitted.)

Q (By Ms. Shirey): So how long have you been at the Department of Ecology?

A I started in August of 2012.

Q So about six years?

A That's right.

Q And what do you currently do at Ecology?

A Currently, I'm engineer in support of permitting and policy.

Q Looking at your resume' here, it looks like your job changed at Ecology in 2016; is that right?

A That's right. I started at Ecology in the PSD program, although, even then, I had some other roles, but primarily doing permitting. I did do a RACT analysis, that project ended, and then I pursued another opening. There was an opening for permit and policy engineer and I started that in November of 2016. Since I was still working on two PSD projects at the time, PSD lead for a

group, Marc Crooks asked me to continue those two projects. One of them was the Tesoro project mentioned today, that has since been completed, and BP is my last PSD project.

Q So you just answered my next question. As part of your job, were you involved in the PSD permit for the BP coker heater project?

A Yes, I was.

Q And what was your role in that permit process?

A I was the permit engineer for the coker heater replacement project.

Q And what does that mean, what did you do?

A So I would review the application when it came in. Initial application came in in, I believe, September of 2014. We're required to prepare a completeness determination, whether the application is complete or incomplete. We have 30 days to do so. And we submitted an incomplete determination in October, I believe, of 2014. And since then, they've since submitted a new application. I refer to it as the March application. We're referring to it as the consolidated June application. Technically, it was the March application that came in. I determined it to be complete in April. Once again, I had 30 days to do so. There was some correspondence. I thought it would be convenient, as we

anticipated going to public review, to consolidate the March application with that correspondence and thus we have a June 2016 application, and I've been working with it ever since. Response to comments, we received numerous comments through to the present.

Q So did you sign the permit?

A I did.

Q And did you stamp the permit with your professional engineer stamp?

A Yes, I did.

Q What does it mean when you stamp a permit with your professional engineering stamp?

A To the best of your knowledge and engineering discretion, it satisfies the requirements that you're asked to look at, in this case, WACC, PSD requirements, down the line, everything that's required to be done. And if they satisfy all those requirements, my understanding is we have to issue the permit. Until we had all the information and a complete application and answered the responsive comments, we did so, we issued the permit.

Q And as part of your review, did you ask BP to answer questions, to review things, did you have questions for BP?

A Yes, we did.

Q I want to turn to Exhibit JE-1. Do you recognize this document?
A Yes, I do.
Q What is it?
A That's the June application that I just referred to for Cherry Point coker heater replacement project.
Q I want to turn, and I apologize because I did not write down the JE number on this, and it's going to be hard to find, but when I find it, I'll let you know. It's Appendix G, pages 1 through 5. Appendix G is JE000249.
A Okay. I have it.
Q Okay. And I'm turning to -- well, let's start with page 3 of that, which is JE000255. Let's go back to 253. Do you see the JE numbers there on the bottom?
A I see it. I'm there.
Q So what is this? At the top it says, "Response to Comments." What comments are those, who is responding to what?
A Oh, okay. This looks like BP's response to our incompleteness letter, the October 2014 incompleteness letter, and here is the response to all of our concerns.
Q I just want to highlight a couple of these to see what kind of questions you asked. What was Ecology question number 2?
A You mean read that whole paragraph?

Q Well --
A I can summarize it. I spent, it was me, it was not National Park Service, I reviewed our emission inventory and emission inventory personnel Sally Otterson, I asked her for the emission inventory for the facility. I looked through every single baseline emissions for this project, every unit, and I found some discrepancies and I list what those are.
Q Discrepancies between what?
A Between the baseline emissions listed in the application and those in our emission inventory.
Q And turning a couple of pages to Ecology question number 12.
A Okay.
Q So what were you asking for there, what were you looking at there?
A Okay. It involved gas treatment system. We asked for a clear analysis as to how they determined the cost per ton.
Q It wasn't just gas -- can you look at that?
A And pressure rising off-gas with new compressor.
Q And what were your questions there?
A We asked for a clear analysis of how they determined the cost per ton of these options and on what basis the estimated values in the table they gave us were derived.

We also asked if the 7 percent interest rate used in the calculations was outdated or not.

Q Okay. And question 13, what was that question looking for?

A So I did my master's thesis on wet electrostatic precipitators and I was surprised not to see that listed as one of their control options, so I asked why they didn't include it. I asked them to include it.

Q Question 15, what is that?

A Oh, yes. I wanted to know where their safety factor came from and what are their emission factors.

Q And as part of what kind of analysis?

A It was a particulate matter BACT emission factor.

Q I think that's enough. I just wanted to give a sense of questions you had asked. Are these the only questions you asked BP?

A No. As you can see, there's a few other pages. Our modelers also submitted some of these questions. These are the questions we asked them formally as part of the incompleteness letter, and we did have continued correspondence during this time asking for clarifications.

Q As part of your evaluation or your review of the permit application, was the National Park Service required to be involved in this permitting process?

A Yes, they were.
Q And why was that?
A Because for PSD projects, I think our WAC specifically says we need to starting from the beginning -- actually, the onus is on the applicant. We need to make sure the applicant submits the application to the federal land managers. I specifically remember working with Kyle Heitkamp, giving him new updates of who those contacts were and he did submit the application. So he'd been involved from the beginning. Even before that time, Kyle Heitkamp mentioned the pre-application meeting and, yes, so they'd been involved early on. I believe that was March of 2014.
Q Did the National Park Service provide an analysis as part of the permitting development in this case?
A Any specific time frame or early on or later?
Q Whenever.
A Yes, they did.
Q Did you review that analysis?
A Yes, we did.
Q Did you reach any conclusions after reviewing the National Park Service analysis?
A Yes, we did.
Q And what did you determine?
A We didn't agree with the overall adverse impact

determination, but as we cite in our technical support document, we thought they were helpful comments and we went back to BP and said we think you need to follow FLAG more closely. I think the baseline was one issue and others have mentioned it. Yeah, we looked at it, reviewed it and went back to BP and said we would like you to address some of these things.

Q So was a baseline the only question?

A The only concern?

Q Yes.

A No. There were issues of using capable of accommodating, as I mentioned, in our technical support document, that's a PSD concept, and we said shouldn't use that for AQRVs.

Q Can you explain a little bit what capable of accommodating means?

A Sure. PSD allows demand exclusions. It says you shall exclude in the PSD regulations. Eric Hansen mentioned CFR 52.21 allows the applicant to exclude emissions that they could have accommodated and have documented at some point that they could operate at that level for at least 30 days, and if they're not using those emissions, you can exclude them as part of this provision, and they did so. And we said that's fine for PSD applicability; for AQRVs, we don't see that listed in the FLAG manual.

Q Could you turn to Joint Exhibit Number 2. That's in that same binder you are in now. I believe you testified that you asked BP to redo its analysis of AQRVs; is that right?
A Yes.
Q Joint Exhibit Number 2, do you recognize this exhibit?
A Yes. This we refer to as the November supplemental.
Q Is this BP's revised AQRV analysis?
A Yes, it is.
Q Did you review this analysis?
A Yes, we did.
Q Did BP change the baseline that you asked them to do?
A They did.
Q And did they change anything else?
A Yes, they did.
Q What else did they change?
A These numbers no longer include capable of accommodating demand exclusion numbers just as we asked them.
Q Is there anything else that is different in this?
A Yes. They also asked for a lower limit than they had initially asked for for SO2 from 40 pounds per hour to 37 pounds per hour.
Q Does the permit that was issued reflect that change?
A Yes, it does.
Q Okay. So I want to turn to in the same exhibit, page 9,

which is JE000309, and I want to look at Table 3.
A Okay.
Q So can you describe what that is?
A This is their, I call it, revised Q/d analysis, and we see with this new revision, their Q/d values are still less than 10.
Q So we've heard a lot about Q/d, and I hesitate to ask you to explain once more what Q/d is, but I wonder if you would.
A Sure. It's addressed on page 18, the bottom right side of the page in the FLAG manual where it described the four pollutants you should sum up, Q them up. They are sulfur dioxide, nitrogen oxide, butane and sulfuric acid. And you take that Q value, and it's described as the -- specifically described based on a maximum 24-hour values, talking about the coker heaters. And then the distance, "d" represents distance, as we mentioned earlier, to the closest Class I area, 78 kilometers at Olympic National Park, and 102 and the rest of them have a farther distance, but if you divide the Q value by the "d" value, every one of them is less than 10.
Q I am going to stop you because you're going on a bit. You mention the FLAG guidance at page 18. I want to turn to that. So that's JE-11, page 18, which is JE001141.

A Okay.
Q So you were talking about, I believe, how the guidance here talks about how to calculate Q/d; is that correct?
A That's right.
Q And so, again, what were the pollutants involved?
A They are listed here, SO2, NOx, particulate matter 10 microns or less, and sulfuric acid.
Q And what are you looking at about those emissions, about those pollutants?
A According to FLAG?
Q Yes.
A You look at their annual emissions in tons per year based on their 24-hour maximum allowable emissions.
Q Okay. And so that's Q?
A That's Q.
Q And what is "d"?
A "d" is the distance in kilometers from the Class I area.
Q And what does this say about Q/d?
A It says if the distance to that Class I area is 10 or less, the agencies would not request any further Class I AQRV impact analysis from such sources.
Q Okay. You said if the distance is 10 or less?
A If Q/d is 10 or less.
Q So did BP follow this guidance in its November 2016 Q/d analysis?

A Yes.
Q So I want to go back to JE-2, page 5.
A Okay.
Q I believe on page 5 they talk about the updated screening procedure. Do you see that?
A Yes.
Q So what did they say they did? What did BP say it did?
A Sure. So they say, "The modeling protocol for the PSD permit application presented a Q/d screening analysis that indicated further evaluation of AQRV was not warranted," and then they provide a table showing the results.
Q All right. I think it refers to adjusted annual emissions, updated Q/d from coker heaters adjusted to annual emissions. Do you know what that means?
A Yes.
Q What is that?
A So it's based on a maximum 24-hour emission rate, so that's the starting point, and FLAG says to use annual, and so you adjust it to the annual emissions.
Q By multiplying times --
A That's correct, you adjust them up to figure out the hours in a year, and you want to use tons also.
Q So you convert pounds per day into pounds per year?
A That's correct.

Q So NPCA said BP did not include all the relevant emissions to calculate Q/d. Can you explain what emissions NPCA thinks BP should have included?
A The term we have used, affected units.
Q Okay. So emissions from the affected units?
A I'm sorry, the emissions from the affected units.
Q Will the 24-hour emissions from those units increase?
A No, they will not.
Q So should their annual emission increase be included in the Q/d analysis?
A No, because they're based on 24-hour maximum level emissions.
Q The Q/d analysis is based on that?
A That's correct.
Q So turn to, I think you already said this, but turn to page 9, Table 5.
A Okay.
Q The updated Q/d summary, and what does that show?
A So, yes, as I mentioned earlier, it shows results -- let me back up a little bit. Shows Class I areas, lists them out, what each Class I area is, the distance to each Class I area, and then the Q/d values with new cokers only, and then if they also take credit for the removal of the existing heaters, which they will be removed, this table also shows the Q/d results of that

calculation also.
Q Okay. So did you do a Q/d analysis on your own or to supplement this one?
A Recently we did. We try to accommodate the question we don't think you should do it this way, but even if you take a step down that road, we still see Q/d values less than 10.
Q I wonder if you could turn to Ecology Exhibit Number 5.
A Okay.
Q So do you recognize this document?
A Yes, I do.
Q What is it?
A So this is extracted from BP's November supplement, Table 2, which they used for long-term AQRV analysis for deposition.
Q Before you get into too much detail, just tell me generally what this is.
A Sure. This lists those pollutants we just mentioned for Q/d analysis for both the coker heaters and the affected units.
Q So is this the Q/d analysis that you performed?
A Yes.
Q Thank you. So now did you do the Q/d analysis, the calculations on this page?
A Yes.

Q Now you can get into detail about what this document shows.
A Okay. At the top are the coker heaters, the only units that have maximum 24-hour level increases, so potential to emit and appropriate. For the rest of the affected units, we added the increase due to the project and added up the four pollutants I mentioned. We added that fourth pollutant on the right side of the page because this table was used for something else by BP which does not need sulfuric acid. So we added sulfuric acid and came up with the sulfuric acid number, we used the ratio from their application. We even looked at it from a more conservative approach of how much sulfuric acid is used. Summed them up, divided it up by the closest Class I area, which is that 78 kilometers from the facility and we still see numbers less than 10.
Q So I want to point you to the farthest left-hand column, down toward the bottom. Do you see the row that says "notes"?
A Yes.
Q And then it says asterisk star Q equals.
A Yes.
Q What is that?
A So the number there is 589.8. That is the sum of the green boxes, four green boxes, in this chart.

Q Okay. And what is the one below it which has two stars and Q?
A Just looking at sulfuric acid for a more conservative overestimated point of view, assuming up to 20 percent of all the SO2, assuming sulfuric acid represents 20 percent of the SO2 for all those other units, which we have no indication that it does, but just like to be conservative, overestimate, and that number, 605.7, is the sum, using that higher estimated sulfuric acid number.
Q So you said, I think, a minute ago that you provided the h2so4 numbers; is that right?
A Yes.
Q And where do they come from?
A Like I said, they came from the application. We used a ratio of what the application showed sulfuric acid was to SO2.
Q In other words, you're saying if you have got a certain amount of SO2 emissions, then you'll also have a certain amount of h2so4 emissions?
A That's the way it's presented in the application, in those ratios.
Q And it would be a certain fraction, the amount of h2so4 would be a certain fraction of SO2?
A Yes.

Q So you've come up with a range of -- you've got a high and a low range for Q; is that right?
A Yes.
Q And so then you have the nearest "d." Do you know what national park that is?
A North Cascades.
Q And then you have two different Q/d values; is that right?
A Yes.
Q A high and a low. And what are those?
A The lower one is 7.6 and higher one is 7.8.
Q So what were you trying to show with this document?
A So we believe BP did it right and what I just did was an incorrect way to do it, but trying to accommodate and look at a reasonable approach that if you're going to include the affected units, you should look at just the increases from those units, not -- if you want to look at the annual emissions from those units, you look at the actual annual emissions, not invented 24-hour increases which don't exist. And this is the highest value that we could find, using the most conservative overestimated method, and it was still less than 10.
Q Thank you. So in paragraph 22 of his prefiled testimony, Mr. Gebhart says Q/d is irrelevant for BP's project because the two affected national parks are

already impacted by emissions. Do you agree?
A Could you repeat the first part.
Q So in paragraph 22 of Mr. Gebhart's prefiled testimony, he said that Q/d is irrelevant here because the two national parks are already impacted by emissions. Do you agree with that?
A No, I don't.
Q And why not?
A There is nothing in FLAG that says a facility that already has impacts cannot use Q/d.
Q In your experience, have Q/d analyses been used to screen out projects from other facilities that impact Class I areas?
A Yes.
Q Could you describe them?
A Sure. Concurrently with this permit, I also prepared a Tesoro Refinery clean products upgrade project, and they also used Q/d and screened out -- and they did not do visibility and deposition analysis, they just stopped after Q/d showed that the value was less than 10.
Q Thank you. In the BP permitting process, did you get any feedback from any federal land managers that Q/d was relevant?
A Yes, we did.
Q So what did you get?

A We got an email from one of the federal land managers sent to our modeler, saying that as long as -- this is with respect to the coker heater replacement project -- said as long as Q/d is less than 10, I believe his exact words were we have no further concerns, or something along those lines.
Q Can you turn to Ecology Exhibit Number 7.
A Okay.
Q Can you describe this document?
A Sure. This is the email I just referred to a minute ago.
Q And who is it from?
A It's from Rick Graw. I believe he's former Forest Service federal land manager. I think he's still involved somewhat, although, James Miller is currently the Forest Service contact for us. And it's an email to Clint Bowman at Department of Ecology, who has since retired. And it says -- well, let me give you the date. This is Monday, the 24th of March, 2014. And Mr. Rick Graw from FLMs says, "If all the Q/ds remain less than 10, I have no comments."
Q This is the email that you were referring to a minute ago that Ecology got?
A Yes.
Q Okay. I want to turn to Ecology Exhibit R-6.

A Okay.
Q Do you recognize this document?
A Yes.
Q So what is this?
A This is the March 2014 application from BP to Ecology that I referred to earlier.
Q What part of the application is it?
A Oh, okay, I'm sorry, this is two years before then. This is the modeling protocol. It's not the application, it's the modeling protocol submitted prior to the March application.
Q What did BP do with this document? What was the purpose of this document?
A We had pre-application meetings for all of our PSD projects that we considered very important. We give twice the amount of time for PSD major projects pre-application meetings than we do for minor NSR projects. We want to make sure everyone is on the same page, save time, and that was the purpose for this pre-application meeting. Even prior to the meeting, this document was being sent to our modelers and correspondence had already begun even before Marc Crooks and I were involved in this project.
Q And so this modeling protocol, what was it used for, what was it designed for?

A Like I said, we want to make sure everyone is on the same page, that the approach to the modeling that BP was proposing to use would be agreed upon or if there was any questions, they could be sorted out at that time.
Q I want to turn to page 18 of this document.
A Okay.
Q So does this document explain the emissions that BP was going to include in its modeling analysis for the AQRV analysis?
A Yes.
Q And could you look at the first paragraph on page 18. Does that describe what those emissions were going to be?
A So the top of page 18 describes their preliminary Q/d analysis, and they described how they came about coming up with these values, and they provide the results in a table, which showed that Q/d value is less than 10 even for that closest national park, North Cascades, and the value showed a Q/d value of 7.
Q So going back up to the paragraph above the table, what does it say about the emissions that BP was going to model?
A Starting from --
Q Just take your time and read the paragraph so you can refresh your memory about what it says there.

A Sure. So it's written here at the top of page 18, it says, "Table 4 lists the approximate distance between the site and the Class I areas as well as the Q/d total emissions in tons per year divided by the distance in kilometers. A preliminary net emission increase in Q is based on the sum of the 24-hour NOx, SO2, PM10 and sulfuric acid emissions from the two new cokers assuming continuous operation 365 days a year. BP does not expect an increase in short-term emissions from any other emissions unit affected by the project."

Q Okay. So that describes how BP was going to calculate the emissions that were going to be used in its modeling protocol, right?

A Yeah.

MS. SHIREY: And so I would ask the board to admit Ecology Exhibit 7 and 6.

MR. WISE: Any objections?

MS. BRIMMER: No objection.

MR. WISE: Ecology Exhibit 6 and 7 are admitted.

(R-ECY-6 & R-ECY-7 admitted.)

Q (By Ms. Shirey): So once BP had done the Q/d analysis, were they required to do anything more?

A In regards to AQRV? No, they were not.

Q Did BP do anything more?

A Yes, they did.
Q What did they do?
A They did a full-blown analysis of its ability comparing to the FLAG thresholds and a full-blown AQRV modeling analysis of deposition and compared it to the deposition thresholds also listed in FLAG.
Q And for the sake of time, I'm not going to walk through all that, but what did they find; do you remember in general what they found?
A Sure. In general, they found that for visibility, the project's impacts would be less than the visibility thresholds listed in FLAG, and, similarly, for deposition, for both sulfur and nitrogen, the deposition values after modeling showed results less than the DAT, which is the deposition thresholds listed in FLAG.
Q And a few moments ago, you said that you asked BP to redo its analysis. I think we actually covered all of that.

So in paragraph 107 of his prefiled testimony, Mr. Gebhart said the net emissions increase BP used for the deposition analysis in the November supplement is wrong because it compares future projected emissions to past actual emissions instead of comparing the maximum allowable future emissions to past actual emissions. Is that consistent with what you understand

Mr. Gebhart's position to be?
A With regards to deposition, yes.
Q So do you agree that BP used future projected emissions rather than maximum allowable future emissions for the deposition analysis?
A Yes.
Q Do you think that this is a wrong approach?
A No, I do not.
Q Why not?
A Because there are no maximum level increases.
Q And so what do you mean by that?
A They're not increasing their 24-hour maximum increases. Furthermore, FLAG doesn't really get into how to do a deposition analysis. I think BP's approach, their consultant's approach, makes total sense to look at the actual emissions. When you look at a new or modified source, you want to look at its emissions. FLAG is consistent with that. Page 21 of FLAG at the top of the third paragraph on the left-hand side of the page, it says exactly that, that for new or modified sources, you look at its emissions. And new source review, that implied increases, its emission increases. Since it has no 24-hour emission increases, you don't have anything to work with.
Q So the units that were added through the deposition

analysis in addition to the coker heater emissions -- in addition to coker heaters, the deposition analysis looked at a number of other units; is that correct?

A Yes.

Q Were those modified units?

A No.

Q And so I think what you were saying just now was that -- so does FLAG, say, have a deal with units that are not modified?

A It does not.

Q In paragraph 70 of Mr. Gebhart's prefiled testimony, he says that the updated November analysis was incorrect because it doesn't look at emission increases from all of the affected units. First of all, what are the affected units?

A All the units that experience increased utilization due to this project, which will be everything else listed in the application, all the other units except the coker heaters.

Q Were those modified units?

A No.

Q So do you agree that BP's analysis, I'm talking visibility now, do you agree that BP's visibility analysis does not look at emission increases from all the affected emission units?

A That's correct.
Q Do you agree with Mr. Gebhart that BP's method was incorrect?
A No, I do not.
Q Why not?
A As I said, there's no maximum 24-hour increases from the affected units, and that's the criteria, that's the box you have to check for visibility.
Q So in paragraph 73 of his prefiled testimony, Mr. Gebhart says that in order to eliminate the affected units, BP, in effect, subtracted the present maximum allowable 24-hour emissions from those units from the future maximum allowable 24-hour emissions from those units, which comes to zero, because those emission limits have not been changed. Do you agree with that characterization of what BP did?
A And this is with respect to visibility?
Q Visibility.
A I see BP not including the affected units because they have no 24-hour increases, end of story; they just don't have them.
Q In paragraphs 48 and 75 of his prefiled testimony, Mr. Gebhart says that the FLAG guidance on page 24, Footnote 6, which I think we've heard of already, that that governs how BP should have calculated the net

emissions increase. So why don't we turn to that, Exhibit JE-11. So page 24, which is JE001147.

A Okay.

Q So what does Footnote 6 have to say?

A Footnote 6. "Note that this is different from the emission change calculation used for short-term increment, which is calculated as the maximum allowable 24-hour average minus the highest occurrence over the past two years."

Q What is that footnote referring back to?

A About halfway up the page, it's just above the paragraph, the heading "Model Receptor Grid," describing emissions input for visibility analysis.

Q And that paragraph talks about what applicants must do to calculate the 24-hour average net emissions increase, right?

A Yes.

Q And what does it say to do?

A "Applicant should calculate the 24-hour average net emission increase for each pollutant from modified facilities as the maximum allowable 24-hour average minus the actual hourly rate averaged over the past two years." In parenthesis "Annual emissions over past two years divided by hours of operation over last two years."

Q So Mr. Gebhart says that Footnote 6 says you can't subtract maximum past emissions from maximum future emissions to get the net emissions increase. Do you agree with Mr. Gebhart?

A Is he quoting Footnote 6 or is he saying BP did not follow Footnote 6?

Q He's saying -- well, he is saying that you can't subtract the maximum past emissions from the maximum future emissions, and I'm wondering -- I guess the first question is, is that what Footnote 6 says?

A No. Footnote 6 talks about -- what they're asking here is different from calculating maximum allowable 24-hour average minus the highest occurrence over the past year.

Q So in that same paragraph he said that -- in the previous paragraph I mentioned, which was paragraphs 48 and 75, he said that BP made a mistake in its visibility analysis because, in effect, it subtracted the maximum past emissions from the maximum future emissions to get the net emissions increase. Do you agree that that's what BP did?

A No. After we've established that visibility is just for the units with short-term emission increases, we are down to the coker heaters, and for NOx, for example, you can see their maximum allowable limit is 18.2 pounds per hour for each heater, and what they subtracted was not

the maximum over the last two years, but they took their facility average of 2014 and 2015, which came to about 16 pounds per hour, or 8 pounds per hour per year, as they show in Table 1 of their November submittal.

Q So that's what they did for the coker heaters. What did they do for the rest of the units?

A For visibility, as we mentioned earlier, there are no 24-hour maximum emission increases, so they didn't have to do anything and they didn't.

Q In paragraph 124 of Mr. Gebhart's prefiled testimony, he says that the National Park Service named five projects that used the approach he is advocating for looking at emissions from a project that impacted federal Class I areas, and he cited to Joint Exhibit 7, so I want to turn to Joint Exhibit 7 at JE000991.

MR. WISE: Ms. Shirey, when you come to a stopping place, we'll take our afternoon break.

MS. SHIREY: Okay.

MR. WISE: Do you have any idea how much longer that will be?

MS. SHIREY: I can wait until we get off the AQRV questions and on to BACT, or I can stop in the middle of the AQRV questions pretty quickly here. Which would you prefer?

MR. WISE: Probably need to stop

sooner rather than later.

MS. SHIREY: Okay. So I will just ask this one question and then we can stop.

Q (By Ms. Shirey): So Joint Exhibit 7 --

A Okay.

Q -- page 991. So Mr. Gebhart cites to this page and he cites to Footnote 37. Do you see that?

A Okay.

Q I need to find it now. So what does Footnote 37 do there?

A It lists some facilities.

Q And what does Footnote 37 refer back to?

A Looks like the second-to-the-last paragraph.

Q And what does that sentence talk about?

A It says, "It is also helpful to consider how modified sources have been addressed elsewhere. A review of National Park Service files found five examples where we had requested that state permitting authorities evaluate the entire source."

Q Okay. So presumably Footnote 37 is listing those five sources?

A Yes.

Q Mr. Gebhart, I believe, testified in response to a question I asked, that he did not provide any information about those five sources. Do you know, did

National Park Service provide any information about those five sources?

A I don't recall.

Q Meaning you don't remember at all or you don't remember seeing anything?

A We've had some correspondence with the Park Service. I don't recall these facilities.

Q Can you tell from the information that you were just looking at anything about the five projects, why they might have been asked to model emissions from the entire facility?

A I don't know.

Q Okay. That's it for now.

MR. WISE: Thank you. We'll take a 15-minute break, come back at 3:15, and we'll continue.

(Recess from 3:00 p.m. to 3:15 p.m.)

MR. WISE: Please be seated. Counsel, I just had a procedural question to start with. Mr. Huitsing has been named as a witness by both NPCA and Ecology, and I'm just trying to figure out the most efficient way to do that. Here's kind of what I'm thinking. Ms. Shirey finishes her direct, then Ms. Brimmer comes up and asks whatever questions she wants, and then we just sort of do it in tandem and work our way through this. What do you think of that?

MS. BRIMMER: I think I can make it even easier for you. I'll forego any direct examination of Mr. Huitsing an I'll just rely on cross.

MR. WISE: Okay. You will just treat him like an adverse witness and start the cross.

MS. BRIMMER: That's okay with me.

MR. WISE: Okay. Well, we can just do that then. And I didn't want to do two sequences.

MS. BRIMMER: I agree. That doesn't make sense.

MR. WISE: Thank you very much. Proceed, Ms. Shirey.

MS. SHIREY: The first thing I would like to do is ask for the admission of Ecology Exhibit Number 5, which is a document we just looked at and contains Gary's Q/d analysis.

MR. WISE: Any objections?

MS. BRIMMER: No objection, Your Honor.

MR. WISE: Ecology Exhibit Number 5 is admitted.

(R-ECY-5 admitted.)

Q (By Ms. Shirey): I wonder if you could turn to Exhibit P-7.

A Okay.

Q Do you recognize this exhibit?
A Yes, I do.
Q And so what is it?
A FLAG Response to Public Comments on Revised Phase 1 Report, dated 2010.
Q Turn to page 2, the portion of the document under Section 2.11, Net Emissions Increase Calculation.
A Okay.
Q So do you know what this is about?
A There is a comment about commenters objecting to the federal land manager approach of calculating net emission increases for modified facilities.
Q And what is the response to that comment?
A Would you like me to read it?
Q I'm fine with you reading it, but if you can summarize it, that would be fine, although, I understand if you can't because it's very term intensive.
A I'll read it. So the response is, "FLAG advises applicants to calculate the 24-hour average net emission increase for each pollutant from modified facilities as a maximum allowable 24-hour average minus the actual hourly rate averaged over the past two years, annual emissions over past two years divided by hours of operation over the last two years. We recognize that this approach is different from the emission change

calculation used for a short-term increment, which is calculated as the maximum allowable 24-hour average minus the highest occurrence over the past two years. The reason for the differing approaches is so that FLMs can better assess the impacts of modified sources on AQRVs especially in a situation where a source does not increase its maximum emissions but increases its annual capacity factor by operating more days throughout the year. By operating more days per year, such a modified source could potentially impact visibility on more days of the year."

Q So does this response say anything about which emission units to use in the analysis?

A It says FLAG advises to use a maximum allowable 24-hour average.

Q From which emission units, or does it say?

A Oh, from modified facilities, it says.

Q Okay. How does this document or this response, in your opinion, apply to the BP coker heater situation?

A So I see two things here that seem clear. It's clearly talking about visibility, that's in the last sentence, so, once again, we go to FLAG's guidance on describing visibility, and we know FLAG was meant primarily but not solely for new source review, so we are talking about emission increases. And so we have already described

that only units that have short-term emission increases should be used in a visibility analysis. And what's also clear here is that because they are talking about visibility, there appears to be a contradiction. The second-to-the-last sentence, it says, "The reason for the differing approaches is so that the FLMs can better assess the impacts of modified sources on AQRVs especially in a situation where a source does not increase its maximum emissions." So I stop there, and to substitution, we already know that if a source's maximum emission increases, should look at visibility, and if it does not, don't. So in this situation, saying where a source does not have visibility impacts, we are going to try a way to look at them anyway, which may give them some information on a yearly basis, but it's contradictory to FLAG, as we looked through earlier, describing visibility impacts based on 24-hour maximum allowable emissions.

Q Did you have any other thoughts about that or is that about it?

A Yeah. The person from FLM who wrote this response lacked some clarity on what maybe they meant to say, but it has that contradiction there.

Q Are there any other incongruities?

A Possibly. I don't see them right now.

Q Okay. So did federal land managers have concerns about the BP project?
A Yes, they did.
Q I want to turn to Joint Exhibit 6 at JE000950.
MS. BRIMMER: Can you repeat that number?
MS. SHIREY: 000950.
MS. BRIMMER: Thank you.
Q (By Ms. Shirey): So what is this document?
A The JE000950 page?
Q Yes.
A That's enclosure from the National Park Service entitled, National Park Service, NPS, Analysis of Impacts to Air Quality Related Values for the British Petroleum Cherry Point Refinery, Blaine, Washington, dated December 12, 2016.
Q So did Ecology work with the federal land managers to address these concerns?
A Yes, we did.
Q What did you do?
A Okay. This is one of the comments we received. I said we received many comments during our public comment period, which went from, I believe, November 14th through December 16th of 2016. And on that last day of that comment period, these comments were submitted from

the National Park Service, and we spent the next five months addressing every comment we received, including all of the ones included here from the National Park Service, and our intent was to address them and we felt like we eventually did.

Q Did you send the National Park Service Ecology's draft response to comments?

A Yes, we did.

Q And then what did you do?

A Mark Kirk scheduled two conference calls, made room for two conference calls in the event that maybe it would take more than one conference call to work through these issues. The first conference call, if I got the dates right, was Monday, May 8th of 2017, and the second conference call was scheduled for that Wednesday, May 10th.

Q And so did you have that first conference call?

A We did.

Q And what did you do on that call?

A So we talked through our responses to their comments. Just to give you some context, we received about 134 comments for this project, and I think Earthjustice comments were numbered 1 through 87, or something like that, and from the Park Service, there was I believe around 40 questions, so those would have been comments

87 to 140, something like that, and the remaining comments were from the EPA. By this time we had already worked through all the issues that the EPA had. We did meet with the Park Service also to work through their comments with them.

Q So what did the Park Service have to say on that first conference call?

MS. BRIMMER: Objection. Hearsay.

MS. SHIREY: Well, the board's standard for hearsay is that you will accept --

MR. WISE: That's okay, I know the standard. I'm thinking since Mr. Huitsing was present at the meeting, I'm going to allow it.

MS. SHIREY: All right.

A Would you restate the question.

Q (By Ms. Shirey): So what happened on that conference call with the federal land managers?

A Okay. So we talked with the National Park Service and we basically said, have you read our responses to your comments, and they said, yes. And just talking with Marc Crooks, we remembered language similar to the Tesoro comment where there was a reference to addressing issues to the regional haze program. And we offered to meet again on that Wednesday, May 10th of 2016, and they said that a second meeting was not necessary.

Q Okay. So you cancelled the second conference?
A We did, we did not have that.
Q Did Ecology document this response?
A We did.
Q Could you turn to Ecology Exhibit 3.
A Okay.
Q Do you recognize this document?
A Yes, I do.
Q Did you receive a copy of this document? Were you copied on this letter?
A My name is not on here, but I did get an electronic copy, too, yes, I did.
Q What is this document?
A So this is a letter written by Marc Crooks, the lead of the PSD program at Department of Ecology, responding to the adverse impact determination letter that came in on that December 16, last day of the public comment period, and Marc is addressing the Department of Interior, from which the adverse impact determination came.
Q Could you tell us who Marc Crooks is.
A Sure. He's the lead of our PSD program at Department of Ecology for all the PSD permits in the state of Washington.
Q Okay. And so he wrote this letter to Department of the Interior?

A Yeah.
Q And so does this letter describe the process that you went through with the federal land managers?
A Yes, it does.
Q I think that's the paragraph at the top of page 2.
A Okay. Yes, that paragraph references the May 8th conference call.
Q And does it say what the federal land managers did?
A Oh, yes, that's right, so I did forget that. So during our conference call on May 8, towards the end of the call -- oh, that's the second paragraph.
Q That's okay. Keep going.
A So, yes, we offered to organize a future conference call later that week, as I mentioned, and the National Park Service staff declined the second call but responded that they would write a white paper on their issues and concerns regarding air quality at Class I areas. And the NPS requested that after their white paper had been distributed, they would like to hold a conference call to discuss their white paper. So Ecology, Marc Crooks, invited EPA Region 10 air staff to participate and EPA agreed to participate. And since then, we have not yet received that white paper.
Q So you have not?
A No.

Q Have you had the conference call that was mentioned here?
A We did not have that second conference call, no.
MS. SHIREY: I would ask to admit Ecology Exhibit 3 into evidence.
MS. BRIMMER: No objection.
MS. POWER: No objection.
MR. WISE: Ecology Exhibit 3 is admitted.
(R-ECY-3 admitted.)
Q (By Ms. Shirey): Did you receive any other communication from the National Park Service that influenced your thinking on this, on the National Park Service's thoughts?
A Yes.
Q And what was that?
MS. BRIMMER: I just want to preserve a hearsay objection to this.
MR. WISE: Noted.
MS. SHIREY: I'm sorry, objection to what?
MS. BRIMMER: That he is about to talk about what the National Park Service told him and I wanted to make sure I had a continuing hearsay objection.

Q (By Ms. Shirey): Could you turn to Ecology Exhibit 4.
A Okay.
Q Could you describe this exhibit?
A Sure. This is a letter from the United States Department of Interior written to me, dated April 26, 2017.
Q And from the Department of Interior.
A From the, yeah, and it's listed under the heading, the Department of Interior, specifically National Park Service.
Q Did you receive this letter?
A I did.
Q What does this letter say that is relevant to your thinking about the BP project?
A Like I said, it seemed similar to what we understood from our May 8th conference call, and it seemed to be an acknowledgment that their concerns for the facility as a whole should be addressed through a regional progress phase or, as they word it, of the regional haze rule.
Q Can you point to where the letter talks about that?
A Yes, I can. That would be on page 5 of the letter, it's the second paragraph, or the largest paragraph on that page, and this would be starting at the beginning of the paragraph.

MS. SHIREY: I would ask the board if

we could admit Ecology Exhibit 4 into the record.

MR. WISE: Any objection?

MS. BRIMMER: No objection, Your Honor.

MR. WISE: Ecology Exhibit 4 is admitted.

(R-ECY-4 admitted.)

Q (By Ms. Shirey): So did the National Park Service or Department of Interior file a formal finding of adverse impacts with Ecology?

A My understanding is that the December 16 comment was more than just a comment, it was also an adverse impact determination.

Q To your knowledge, has the National Park Service changed its opinion that the BP facility has adverse impacts on North Cascades and Olympic National Parks?

A I have not heard they've changed their opinion on that.

Q So do you believe anything has changed about the National Park Service's opinion?

A Yes, I do.

Q And what would that be?

A That the PSD program is a different route to address facility-wide impacts than the regional haze rule or program is, but they tried to use the PSD program to attain their goals, and we pointed out to them that

that's not the proper route, to use PSD rules, as applied to new source review.

Q And is it your understanding that they agreed with that?

A Yes.

Q Thank you. I want to go on to the BACT analysis for nitrogen oxides. So as part of your review of the permit application, did you review BP's analysis of BACT for nitrogen oxide for the coker heater?

A Yes.

Q In reviewing that analysis, did you look at any other facilities employing selective catalytic reduction for coker heaters?

A Yes.

Q I want to turn to Exhibit JE-1, page 000133. I believe there is a table on this page. What does this table show?

A So, yes, there is a table. The heading of Table 1, NOx and Carbon Monoxide BACT for Coker Heaters, and there is a list of facilities and where they're from and what they've used as BACT.

Q Are these some of the other facilities you considered?

A Yes.

Q So I want to take them in the order listed.

A I should qualify. Not what they used as BACT, but what they consider as BACT and different technologies out

there.
Q So did any of these facilities use selective catalytic reduction as BACT?
A Yes.
Q Which one?
A The first two on the list, Tesoro - Martinez and Shell - Martinez, both in California. The third one is pronounced as Total Refining, that would be Port Arthur, Texas. The fourth one down on this list is Marathon Garyville Refinery in Louisiana. And at the very bottom is reference to the Flint Hill Resources - Pine Bend facility in Minnesota.
Q Did these facilities -- they employed SCR, it looks like; is that right?
A Yes.
Q Did they employ SCR as BACT?
A I believe one of them did. I forget how many. Some of them employed SCR, as I understand it, for other reasons than BACT.
Q Okay. I want to go down through these one at a time in the order they're listed here. The first one is Tesoro - Martinez. Was SCR required as BACT in the Tesoro - Martinez facility?
A My understanding is that it was required under the LAER program, the third new source review program after PSD

major program, minor program, and the non-attainment is another new source review major program. And under that, they are required to lowest achievable emission rate technology and my understanding is that's why they employed SCR.

Q Why would they have been required to use LAER?

A Because they are located in a non-attainment area.

Q How about Shell - Martinez?

A Same reason there.

Q So Shell used SCR as LAER?

A Yes.

Q Because they were in a non-attainment area?

A That's correct.

Q How about Total Refining, I guess it's Total Refining, in Port Arthur, Texas.

A So at the time of their project construction, my understanding is that they were in non-attainment for ozone and so similar situation, using -- let's see, 2008 or '10 -- if you look at the EPA website of non-attainment areas and the times they were considered non-attainment, the start of that project coincides with the time period that they were still in non-attainment for, I believe, ozone.

Q And how about the Marathon - Garyville, Louisiana facility, was SCR required as BACT?

A So it's listed as a technology used at the facility, but specifically -- well, says that could have been rejected as BACT due to its cost economic impact analysis.
Q Could you turn to Ecology Exhibit Number 10.
A Okay.
Q Do you recognize this document?
A Yes.
Q What is it?
A So this is from the Department of Environmental Quality, State of Louisiana. It's with respect to PSD permit and this is a cover letter of the permit itself for that facility.
Q Does it say anything about the cost for BACT for SCR in this letter?
A It does.
Q Where is that?
A Second page of the exhibit, I guess it's listed as page 5 and I guess the fourth paragraph from the bottom of the page, it discusses that the facility is voluntarily installing selective catalytic reduction in addition to ultra-low NOx burners, and it goes on to talk about some other equipment. And then it says at the last sentence of this paragraph, it says, SCRs could have been rejected on the basis of economical infeasibility, and then provided a range of $10,000 to $73,000 per ton of

NOx reduced based on heater size.

MS. SHIREY: So I ask the board to admit Ecology Exhibit 10 into evidence.

MR. WISE: Any objection?

MS. BRIMMER: No objection.

MR. WISE: Exhibit 10 is admitted.

(R-ECY-10 admitted.)

Q (By Ms. Shirey): So the next facility on the list in this table on JE000133 I believe is Flint Hills, Minnesota. What can you tell me about Flint Hills, Minnesota?

A They have installed SCR on their coker heater and I tried to find a cost analysis for this facility. I personally called up, found the engineer's name, but I don't recall at the moment, and I called him up on the telephone and I asked him if a cost analysis had been done, and he was not aware of one.

Q So, first of all, is there one project or two?

A I believe this was the second project. There were two projects. The second one, I believe, is this one.

Q Was SCR required as BACT for either of those projects?

A Yes, they list it as BACT, but as I said, apparently no cost analysis.

Q How about the first project?

A I'm not sure if the first project had been started yet

at the time of this application, I don't know.
Q So there were two projects?
A I don't know if the second one had been started.
Q So which of the two projects were you discussing just now?
A I understood it to be the second one. The numbering system is a little confusing from their website, but talking to the permit engineer, I could be wrong, but, anyway, they didn't have a cost analysis.
Q Did you look at any other facilities?
A Yes.
Q Do you know which other ones you looked at?
A There was one in Arizona, I believe one in North Dakota, I believe an Indiana facility, and I might be missing one.
Q So I'd ask you to turn to Ecology Exhibit 11. Do you recognize this document?
A Yes, I do.
Q What is this document?
A So I mentioned a North Dakota facility and this is a great support document for that facility called the Davis Refinery in Billings County, North Dakota.
Q And does it say anything about installing SCR?
A My recollection of looking at this was that whatever controls they had planned, coker heaters were not listed

as the units that they planned to install. As far as SCR, I don't know if -- all I know is they didn't have any plans to put in a coker unit is what sticks out for me for this facility.

Q Was this a PSD permit application?

A Oh, it's a minor, yeah, so they were a synthetic minor trying to get out of major permitting.

Q So I wonder if you'd turn -- I think that's where you are. Are you at page 4 of this?

A Yes.

Q And if you look at the last sentence of the last paragraph, what does that say?

MS. BRIMMER: I'm sorry, which one is page 4? Is it sheet 4 at the top?

THE WITNESS: Yeah, I wasn't sure either.

MS. SHIREY: I'm sorry, I'm sorry. That's my fault. The bottom of the page says page 4 of 8 under Ecology. No wonder you don't know what I'm talking about. It's the fourth page if you count the pages.

MS. BRIMMER: Do you start with this one as 1?

MS. SHIREY: Yeah.

A And could you repeat the question.

Q (By Ms. Shirey): So the last paragraph on that page, the last sentence, what does that say?
A "Since formal BACT analysis is not required, analysis for energy, environment and economic impacts was not conducted for proposed emission controls."
Q So what does that mean in terms of cost analysis?
A So a cost analysis was not prepared.
MS. SHIREY: I'd ask the board to admit Ecology Exhibit 11.
MR. WISE: Any objections?
MS. BRIMMER: No objection.
MR. WISE: Ecology Exhibit 11 is admitted.
(R-ECY-11 admitted.)
Q (By Ms. Shirey): Would you turn to Ecology Exhibit 12.
A Okay.
Q And what is this document?
A This is a technical support document and statement of basis for construction of a facility in Arizona called Arizona Clean Fuels Yuma, LLC, Petroleum Refinery, dated September of 2006.
Q What can you tell me about this project?
A My understanding, I believe still to be true, to date it has not been built.
Q Is there anything else you can tell me?

A My understanding is that the facility has not been built. It's as if the permit never existed, I've heard that language mentioned by others, but in any case, it was not built.
Q Were they implementing SCR on the coker heaters?
A I believe that was in the permit, yes.
Q So if you'd turn to page 170 of 347.
A Okay.
Q And there is a table on that page. Do you see that?
A Yes.
Q And does that table include delayed coking unit charge heaters?
A Yes, the last row in that table.
Q So can you tell me what the NOx emission controls BACT was going to be for these units?
A So they list a limit of .030 pounds of NOx per million BTU heat input.
Q And does the discussion of this say anything about what that means in terms of emission controls?
A I don't see that here unless I'm missing it. Well, okay, here it is. Yeah, low Nox burners.
Q Where do you see that?
A That would be the paragraph above the table.
Q And where are you looking in that paragraph?
A The first sentence of the second paragraph.

Q So looks like they were not going to be implementing selective catalytic reduction on the coker heaters.
A I don't see it listed here. The previous page discusses SCR, but it's not on this page here, you're right.
Q So what was BACT for the delayed coking units here, the heaters?
A So I'll need to go back to the previous page. Are you still on 170 or can I go to 169?
Q You can go to 169, you can go wherever you need to.
A And would you repeat the question, please.
Q What was required as BACT for the coker heaters on this project?
A Okay. "The department agrees that the permittee's proposal generally represents BACT for NOx emissions for these process heaters," and they go on to describe SCR and a provision for conducting SCR performance demonstrations study, which tells me that they didn't know if it could be demonstrated for this facility, in which case, the facility was never built, so it wasn't demonstrated.
Q Is that discussion talking about the -- I'm just going to skip over this one for now. Sounds like you haven't looked at this in awhile, so --
A So we wrote this one off early when we found out that the facility was never built. You're done then, don't

need to consider a facility that wasn't built. So, no, I admit I didn't spend a lot of time evaluating this nonexistent facility.

Q All right. You said you also looked at the BP Whiting facility. What did you find out about that?

A I have to make sure I get my facilities right. I believe that's the one in Indiana, in a non-attainment area, near Gary, Indiana, in Lake County, northwest corner of the state, and that's a non-attainment area, so they used LAER, they were required to use LAER there.

Q Would you turn to Ecology Exhibit 13.

A Yes.

Q So do you recognize this document?

A Yes, I do.

Q What is it this?

A So this is a document I found researching this facility going to the state of Indiana is where I found it, Indiana Department of Environmental Management, and it shows the non-attainment areas in the state, and as you can see in the top left corner are two counties, one of which is Lake County, which is where the Whiting facility is located, and the bottom of this page it explains that it is in fact a non-attainment area for eight-hour ozone standard.

Q And what does that mean in terms of nitrogen oxide

emissions?
A So they require to employ, in a project that triggers non-attainment threshold, they're required to employ lowest achievable emission rate technology.
Q Even though it's a non-attainment for ozone and not NOx?
A That's correct. They look at VOCs and NOx whenever you have ozone NOx and VOCs come into play.
Q And why is that?
A They lead to the formation of ozone.
Q Okay.

MS. SHIREY: I would ask that Ecology Exhibit 13 be admitted.

MR. WISE: Any objection?

MS. POWER: No.

MS. BRIMMER: No.

MR. WISE: Ecology Exhibit 13 is admitted.

(R-ECY-13 admitted.)

Q (By Ms. Shirey): So if I have counted correctly, it looks like you reviewed eight facilities. Does that sound about right?
A Sounds about right.
Q And there were two projects at one of them, so nine projects. So out of those nine projects, did any require SCR as BACT for coker heaters?

A Yes, some of them did, a few of them did, they listed SCR as BACT.
Q Can you go back. So you told me that --
A The Flint Hills facility listed SCR as BACT, but that was the one that had no cost analysis.
Q Which one?
A The Flint Hills, Minnesota.
Q Any of the other ones?
A Garyville said it was voluntarily listed. Could have been rejected. I don't recall if they considered that BACT or not. Could have been rejected, but it looks like they considered that BACT.
Q But did Garyville employ it as BACT or did they put it on voluntarily?
A They put it on voluntarily, that's right. If you're asking if BACT was required for them to put SCR, the answer is no, if that's what you're asking.
Q And BP - Whiting, was it BACT?
A No. I mean, that's correct, that was a non-attainment area triggered the SCR.
Q And at the Arizona facility?
A Like I said, the facility that was never built.
Q Flint Hills, you said one of them required as BACT?
A Yes.
Q How about the Total, Texas, was that required as BACT?

A That would be LAER.
Q And Marathon, Shell - Martinez?
A Same, LAER required.
Q And Tesoro - Martinez?
A And that would also be LAER.
Q So I think you only named one that was actually where BACT was required; is that right?
A It's listed as BACT without a cost analysis. I believe that's the only one.
Q Okay. Do you know of any other places where selective catalytic reduction has been required as BACT for coker heaters?
A For coker heaters, no.
Q Does EPA guidance say anything about how to evaluate a technology that has not been required as BACT or that has rarely been required as BACT?
A Does it say anything? Yes.
Q I want to turn to Joint Exhibit 12. Do you recognize this exhibit, Joint Exhibit 12?
A Yes. It's the 1990 New Source Review Workshop Manual, Draft, dated October 1990.
Q I want you to turn -- actually, did you hear Al Newman's testimony on this?
A I did.
Q And did he read a portion of this that talked about what

you do when a technology has not been required as BACT or has rarely been required as BACT, do you remember that?

A I believe he read some things; I don't remember exactly.

Q Okay. If you would turn to page 3.45.

A Okay.

Q And in the middle paragraph on that page, the sentence beginning "Specifically."

A Okay.

Q So what does it say there?

A "Specifically, the applicant should document that the cost to the applicant of the control alternative is significantly beyond the range of recent costs normally associated with BACT for the type of facility (or BACT control costs in general) for the pollutant."

Q So I want to turn to Ecology Exhibit 9.

A Okay.

Q Do you recognize this document?

A Yes, I do.

Q Did you help prepare this document?

A Yes, I did.

Q So what is it?

A It's a list of recent BACT determinations for the specific pollutant NOx by the Department of Ecology.

Q And what does it show about cost that Ecology has

rejected -- for costs where Ecology has rejected the control for NOx?

A What the costs are?

Q Yeah.

A It shows costs ranging from approximately 11,600 on up to 65,000 that were all rejected based on economic analysis of being too costly.

Q What does it show about costs that have been accepted as BACT?

A It shows that costs were not calculated for the accepted option.

Q And why was that?

A It's conceivable you could have costs for -- in this case, the next one down, and they just accepted that as BACT and they didn't do a cost analysis to try to get out of it, so to speak.

Q Does that mean that cost analyses are often or normally done to disqualify a technology as BACT?

A Yes, it does.

Q I want to turn to Exhibit R-38, and that's going to be in BP's exhibit book, the white one.

A Which number?

Q R-38.

A Okay.

Q What is this document?

A This is a cost analysis that has Ramboll's name on it as BP's consultant for the BP coker heater equipped with an SCR, dated April 4, 2018.
Q So this would be BP's corrected cost analysis, is that right, correcting for the error that they found that they had earlier been comparing the costs of two SCRs to the benefits of one; is that right?
A Yes, that's my understanding.
Q So what is the cost effectiveness number on this document?
A So there's two columns provided. The lowest cost on the page is $12,361 per ton of NOx removed.
Q So does that change your opinion about whether SCR should be BACT in this case?
A No, it does not.
Q So did this come as a surprise to you that BP's earlier cost effectiveness analysis evaluated as SCR evaluated costs for two SCR units and emissions from just one?
A Yes.
Q Was there anything in BP's 2016 permit application that indicated that the cost analyses were looking at costs for two SCRs?
A If there was, I missed it.
Q So did you see anything?
A I did not.

Q All right. When you got this updated analysis, did you question it at all?
A The whole analysis or a specific part?
Q No, the whole thing.
A I did.
Q So what did you question?
A That they had used a higher ammonia reagent value cost per pound previously and now it's dropped significantly from before, so I looked into -- I questioned that initially.
Q And what did you find?
A The price of ammonia has changed; it bounces around a lot. If an applicant comes and says the price of ammonia is double the last three years and gone back, moved around a lot, we provide some latitude in what cost for ammonia they we would propose, because, remember, we're looking at a 25-year period. I looked back, I think, the last four and half years from when the project started and I found costs up to maybe 35 cents a pound, and you go back a little further, you could find maybe 38 cents a pound. I think they reached 45 cents a pound prior to that. So I would have been willing to accept a slightly higher cost, to be honest, because of the way the price has bounced around, but consistent with them, BP tends to be conservative,

although, they missed that and I did, too, at the double counting of the SCR. Other than that, they tend to overestimate, which is helpful to an engineer when you know the applicant is overestimating emissions, so if they make a mistake like this, as you can see, they're still above our back threshold.

Q Okay. I want to take a little bit closer look at the costs in this analysis. What does the analysis show is the annual interest rate?

A Seven percent.

Q Do you agree that that is appropriate for this project?

A My understanding is, yes, it is.

Q And why is that?

A They list the reference to the cost manual.

Q So did you hear the discussion earlier today about interest rates with Alan Newman?

A I did.

Q Do you agree with Mr. Newman about 7 percent interest rates?

A I do.

Q And have you been trained on how to do these analyses?

A I haven't been in the Department of Ecology as long as he has, but when I see a default value in a cost manual, that's okay; as far as I'm concerned, it's a usable number.

Q All right. So what does this document show about the contingency rate?
A I believe it says 15 percent. I haven't found it yet, but I'm pretty sure that's here somewhere. I'm not seeing it, but I do recall -- okay, there it is, it's 15 percent.
Q In paragraph 78 of his prefiled testimony, Dr. Sahu claims that the contingency rate should have been 5 percent rather than 15 percent. Do you agree with that?
A No, I do not.
Q Why not?
A BP started with a facility-specific contingency factor of 30 percent. They wanted to err on the side of the EPA manual. Once again, as a permit engineer, I appreciate some consistency there, but referring back to the cost manual, it's 15 percent.
Q So in paragraphs 52 and 54 of his prefiled testimony, Dr. Sahu claims that BP's cost analysis improperly evaluates incremental cost effectiveness rather than average cost effectiveness. Can you talk a little bit about what is average cost effectiveness and what is incremental cost effectiveness?
A Sure. And I had conversations with the BP engineer at the time, when Scott Inloes was the engineer, and I believe also with Colleen Kemp, and discussed using an

average cost analysis, not incremental, and doing some research, the Puzzle Book says you can use the average cost or incremental cost, but if you're going to use incremental cost, you have to use it with some other support, whereas, if you use an average cost, that alone can stand.

Quite often, you'll see both. Some people supplement the incremental cost with an average cost, and that's in compliance with the Puzzle Book. There was a challenge, I believe, at some time in the past where someone, some facility, tried to use an incremental cost by itself, or someone said you cannot use an incremental cost at all, but they lost, you can use it, but as I just said, if you're going to use a incremental cost, you have to have something with it, and most of time, that's an average cost, and as I said, you may have an average cost all by itself.

In this case, BP provided both costs for almost every technology they looked at, every cost analysis they looked at, and never did they rely on an incremental cost in and of itself by itself.

Q How do you evaluate average cost effectiveness?

A Instead of looking at comparison between two control technology alternatives, which would be an incremental cost, you look at total tons removed between the

inherent-based technology and the cost for that in tons removed.

Q And what do you do with an incremental cost effectiveness evaluation?

A That would be just comparing two different control technologies and the cost between them.

Q In your opinion, is this cost analysis in Exhibit R-38, is that an average cost analysis or incremental cost analysis?

A Average.

Q And why do you say that?

A Because they aren't comparing this technology to what I believe now is inherent-based technology.

Q And by that, do you mean the alternative NOx burners?

A Yes.

Q I want to turn to EPA's guidance again, JE-12, at page B-37, which is JE001335.

A I am sorry, could you say that again.

Q JE001335.

A Of which exhibit?

Q Joint Exhibit 12. I think you're in wrong book.

A I'm in 12 and could you repeat the page number one more time.

Q 001335.

A Okay.

Q So I believe on this page it says that, in doing a cost effectiveness analysis, you can't set your baseline as emissions controls necessary to meet new source performance standards. Is that what that says?
A Yes.
Q And are ultra-low NOx burners, do they meet new source performance standards in this case?
A They do.
Q So does that make BP's analysis wrong?
A I don't believe so.
Q And why not?
A Initially, going back to August of 2016, this issue was brought up by the EPA and emailed to the Northwest Clean Air Agency, which is the agency that will enforce this permit, Title V permit. So looking at this 1990 Workshop Guidance Manual, it provides some other options. It says you can take historically higher upper bound as an option. That was the first option that was jumped on and we stuck with that option.

There are other considerations to look at, which BP did. They insisted all along that just, coincidentally, it's the same as the new source performance standard, but to avoid an appearance of trying to err on the side of being conservative, you know, our approach, so we forced them to use an

historical upper bound, which I think acknowledging using historical upper bound, you are talking about the heaters that are going to be removed and that doesn't make much sense if you're going to install new heaters.

So we're now aware of more documents that support the case that ultra-low NOx burners are the inherently lower based technology from which to look at your BACT cost analysis.

Q I want to slow down just a bit. So on that page that you've got with the page B-37 in the EPA Cost Manual, I'm sorry, EPA's PSD manual, does it mention inherently lower pollutant processes somewhere?

A I believe it does. The last paragraph, there is a little bit of an odd -- one-word sentence, a one line that just has a word in it. I'll start before there. It says, "Estimating a realistic upper-bound case scenario does not mean that the source operates in an absolute worst-case manner all the time. For example, in developing a realistic upper boundary case, baseline emissions calculations can also consider inherent physical or operational constraints on the source."

Q I'm going to stop you a minute and look at the paragraph above that. The sentence that starts, "When calculating the cost effectiveness."

A Okay.

Q What does that say?
A It says, "When calculating the cost effectiveness of adding post process emissions controls to certain inherently lower polluting processes, baseline emissions may be assumed to be the emissions from the lower polluting process itself."
Q Okay. So if I'm understanding right, you started out by thinking you could look at the upper bound?
A Yes.
Q And then you found that you were convinced that BP could take -- that the baseline could be assumed to be the emissions from the lower emitting process itself, if I understood you right?
A Yes.
Q Have you seen any EPA guidance letters on this?
A Yes, I have.
Q I wonder if you could turn to Exhibit R-14. That's BP's book.
A I have it.
Q R-14. Are you there?
A Yes.
Q Do you recognize this document?
A Yes, I do.
Q What is it?
A It's a fact sheet for a facility called the Palmdale

Energy Project and Fact Sheet for a permit dated August -- the fact sheet is dated August 2017.

Q I believe that this exhibit has already been admitted. It was discussed yesterday by one of BP's witnesses. So if you turn to page 36, what does this document say -- at the top of 37, I think, what does it say about ultra-low NOx burners?

A The first paragraph?

Q Yes.

A It says, "The applicant submitted a cost analysis demonstrating that SCR is not cost effective for the" facility's "auxiliary boiler. The applicant estimated the cost effectiveness at $58,100 per ton of NOx removed. However, in conducting this analysis, the applicant looked at the cost of reducing NOx from the incremental cost range of going from 9 parts per million using ultra-low NOx burners instead of the total cost effectiveness from the base case. We agree that when calculating the cost effectiveness of adding post process emissions controls to certain inherently lower polluting processes, in this case, ultra-low NOx burners, baseline emissions may be assumed to be the emissions from the lower polluting process itself."

Q Okay. So when you saw this guidance, did that change your thinking at all?

A It did. Our thinking was always that it was a little bogus to use a technology that's going away, the control creator's upper bound, historical upper bound, is going away just because it's coincidentally the same as an NSPS.
Q You got to stop a minute, because what's the same?
A Oh, the proposed limit of the ultra-low NOx burner, capacity of the burner, matches new source performance standard.
Q And so what were you saying about that?
A So on that basis alone, we were erring on the side you can't do this, let's not do that, let's make them use the historical upper bounds. That's what we did until now. It's pretty clear that ultra-low NOx burners are the inherently lower baseline technology and you can use that itself. It justifies not doing the approach that we forced BP to do.
Q So I want to turn to Exhibit JE-1 at page JE000156.
A Okay. Could you repeat the reference.
Q JE000156.
A Of Exhibit 1, correct. I am there.
Q Do you recognize this document?
A I do.
Q What is this?
A This was initial BACT cost analysis that BP provided to

us for SCR use for the coker heaters.
Q And what is the cost effectiveness number on this document?
A It is $39,500 per ton.
Q And when you got questions about the baseline on this document, what did you do, the baseline emissions for this document?
A I continued conversations that we had started with the Northwest Clean Air Agency back in August 2016 and I converted this number using historical upper bound value.
Q What do you mean by you converted the number?
A So instead of using NSPS baseline case as they list there, which is .06 pounds of NOx per million BTU, we used a recent test provided by the Northwest Clean Air Agency, a test result, which was, I believe, first test result was .074 pounds of NOx per million BTU, and we substituted the .074 for the .06 that's in the line near the bottom, fourth line from the bottom. The first row under "Cost Effectiveness," you will see a 303 million BTU per hour, and right after that is .06 pounds NOx million BTU number that I just referred to that we substituted with the .074 pounds per NOx per million BTU provided from the Northwest Clean Air Agency.
Q And that number came from two tests I think you said?

A I think the first one was -- I think just one test or most recent test at that time, I believe.
Q Okay. Could you turn to Ecology Exhibit 14.
A Okay.
Q Do you recognize this document?
A Yes, I do.
Q And so what is it?
A It includes the conversion I just mentioned along with the reference to the Northwest Clean Air Agency email that I also referenced.
Q Did you prepare these calculations?
A This first page is calculations I did, Northwest Clean Air Agency's calculations they did provide, but it's listed in the email that matches the number that I came up with.

MS. SHIREY: Okay. I'm going to ask to get Ecology Exhibit 14 admitted.

MR. WISE: Any objections?

MS. BRIMMER: No objection.

MR. WISE: Ecology Exhibit 14 is admitted.

(R-ECY-14 admitted.)

Q (By Ms. Shirey): So now do you think that the way you did this recalculation was correct?
A I mean, it is correct.

Q I guess I didn't ask that right. Do you think that this recalculation is the correct way to determine the baseline in this case?
A I don't think it's the best way; I don't think it's the most accurate way.
Q What is the best way?
A Since the old coker heaters will be removed, referencing emissions from it seems not as accurate as referencing the new technology, which is the new coker heater ultra-low NOx burner.
Q Okay. So looking back at BP Exhibit R-38, the recalculated BACT cost analysis.
A You said Ecology?
Q I'm sorry, R-38, it's the BP document.
A Okay.
Q So did you do a revised baseline analysis for this particular version of the cost analysis, using the baseline you used for your recalculations of the earlier BACT analysis?
A I believe I did. It's not shown here.
Q So what did you find?
A I think it came to 11,700 or eight hundred. I can't remember the exact number. And I played around with the ammonia number, like I said, on my own, say 33 cents a pound, might be willing to accept 35. Anyway, it was

around 11,000, 12,000 range, closer to 12,000.
Q Okay. So is that document with that calculation, is that one of the exhibits that Ecology has provided for this hearing?
A This one here?
Q No, the one, your recalculation that you were just describing.
A I don't know if it has.
Q I'll tell you it hasn't.
A Okay.
Q So why would we not have provided that?
A Okay. We are convinced now that the approach of doing that, using the historical upper bound, is not the best, although, justified by the Puzzle Book, it's just not appropriate for technology that's going away compared to new information and newer technology, and in light of the fact that it is justified by guidance documents to be the inherently baseline technology.
Q So do you still believe that selective catalytic reduction is not cost effective as BACT for the new coker heaters at BP?
A I do.
MS. SHIREY: I just noticed we're almost at 4:30, and this is a reasonable stopping point, unless you want to keep going.

MR. WISE: I think we'll have to come back tomorrow anyway and I am a little concerned about State Parks' tolerance, so why don't we go ahead and stop today and then we'll start at 9:00 in the morning and finish this up.

MS. BRIMMER: Could I ask a housekeeping question. And I don't know if you need this on the record or not, I'll let you decide. I just want to make sure that I have an understanding, if I could, of how much longer Mr. Huitsing's direct is so that I just have adequate time to do a little bit of cleanup rebuttal at the very end.

MR. WISE: Okay. Ms. Shirey, do you have any idea how much longer?

MS. SHIREY: I can tell you I didn't think it was going to take nearly this long, so -- I thought we'd be done by now. I'm about three quarters of the way through, so --

MS. BRIMMER: My estimate is then that we'll probably finish with Mr. Huitsing at least by noon, so that that would leave time for rebuttal.

MR. WISE: Yeah, hopefully.

MS. POWER: Your Honor, I would just note that to the extent that there is rebuttal, that we ask that it be very limited because all of the expert

testimony was prefiled in this case, and so with respect to rebuttal, it should, in fact, truly be something new that has come out within the hearing that we would expect rebuttal testimony on.

MR. WISE: Yes, I agree, it should address new things that have come up during the hearing.

MS. BRIMMER: There's been quite a bit, so yes.

MR. WISE: Okay. We'll see you tomorrow.

(The hearing recessed at 4:30 p.m. to resume April 27, 2018, at 9:00 a.m.)

C E R T I F I C A T E

STATE OF WASHINGTON)

) ss

COUNTY OF THURSTON)

I, KIM L. OTIS, a Certified Court Reporter in and for the State of Washington, residing at Olympia, do hereby certify;

That the foregoing proceedings were taken before me and thereafter reduced to a typed format under my direction; that the transcript is a full, true and complete transcript of said proceedings consisting of Pages 675 through 905.

That as a CCR in this state, I am bound by the Rules of Conduct as Codified in WAC 308-14-130; that court reporting arrangements and fees in this case are offered to all parties on equal terms.

That I am not a relative, employee, attorney or counsel of any party to this action, or relative or employee of any such attorney or counsel, and I am not financially interested in said action or the outcome thereof;

IN WITNESS WHEREOF, I have hereunto set my hand this 18th day of June, 2018.

Kim L. Otis, CCR No. 2342