**OFFICE OF ZONING AND ADMINISTRATIVE HEARINGS**

**FOR MONTGOMERY COUNTY**

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| **PETITION OF COSTCO WHOLESALE CORPORATION** | : | **Case No. S-2863**<br>**OZAH No. 13-12** |

**A hearing in the above-entitled matter was held on May 12, 2014, commencing at 9:38 a.m., at the Office of Zoning and Administrative Hearings, 100 Maryland Avenue, 2nd Floor Council Hearing Room, Rockville, Maryland 20850 before:**

**Martin L. Grossman**

**Hearing Examiner**

A P P E A R A N C E S

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C O N T E N T S



E X H I B I T S





P R O C E E D I N G S

MR. GROSSMAN: This is the 33rd day of a public hearing in the matter of Costco Wholesale Corporation, Board of Appeals No. S-2863, OZAH No. 13-12, petition for a special exception pursuant to Zoning Ordinance Section 59-G-2.06, to allow petitioner to construct and operate an automobile filling station which would include 16 pumps. The subject site is located at 11160 Veirs Mill Road, Silver Spring, Maryland. That's Lot N, 631 Wheaton Plaza, Parcel 10, also known as Westfield Wheaton Mall, and is zoned C-2.

The hearing was begun on April 26, 2013, and the next session will be on May 20, 2014, here in the second floor hearing room of the COB at 9:30 a.m. This hearing is conducted on behalf of the Board of Appeals. My name is Martin Grossman. I'm the Hearing Examiner, which means I will take evidence, as I have been doing, and write a report and recommendation to the Board of Appeals, which will make the decision in this case. Will the parties identify themselves, please, for the record?

MR. BRANN: Good morning. Erich Brann with Costco.

MR. GROSSMAN: Mr. Brann.

MS. HARRIS: Good morning. Pat Harris on behalf of Costco.

MR. GOECKE: Good morning. Mike Goecke for



Costco.

MR. GROSSMAN: Mr. Goecke, you look a little better today.

MR. GOECKE: A little bit. Thank you.

MS. CORDRY: Karen Cordry for the opposition --

MR. GROSSMAN: Ms. Cordry.

MS. CORDRY: -- Kensington Heights.

MS. ROSENFELD: Good morning, Mr. Grossman. Michele Rosenfeld with Kensington Heights.

MR. GROSSMAN: Ms. Rosenfeld.

MR. SILVERMAN: Good morning, Mr. Grossman. Larry Silverman, Stop Costco Gas Coalition.

MR. GROSSMAN: Mr. Silverman.

MS. ADELMAN: Good morning, Mr. Grossman. Abigail Adelman for the Stop Costco Gas Coalition.

MR. GROSSMAN: Ms. Adelman.

MS. DUCKETT: Eleanor Duckett, Kensington View.

MR. HLINKA: Dennis Hlinka, Sullivan Environmental.

MR. GROSSMAN: Good morning. Okay, we have a couple of preliminary matters. First of all, since our session on May 8th, the parties were too exhausted to file additional exhibits, thankfully, so I didn't receive any e-mails.

MS. CORDRY: I sent one, but it was when I said

we, I said on today I would provide exhibits. They asked if there were any more exhibits coming in, to try to have them in by today, so I filed it this morning at 7:30, so it's not necessarily for today. It's going forward.

MR. GROSSMAN: Okay. I haven't seen that yet.

MS. CORDRY: And I --

MR. GROSSMAN: If they don't come in by the day before --

MS. CORDRY: Right, right.

MR. GROSSMAN: -- obviously they don't get on --

MS. CORDRY: And I gave them copies of it and I have printed out a copy I can give you the next time I come up for, an hour or whatever.

MR. GROSSMAN: You couldn't let me get away with my little fantasy, could you, Ms. Cordry?

MS. CORDRY: I'm sorry. I'm sorry, see, it's a very small little snag. Very small.

MR. GROSSMAN: All right. Thank you. All right, then we'll see if we have time today to get to the applicant's objections. I've had all of the particular exhibits tagged that are objected to, so hopefully we can get to them easily.

MR. GOECKE: Mr. Grossman, did you receive my electronic version of that, that I e-mailed to you?

MR. GROSSMAN: Gee, when did you e-mail that?



MR. GOECKE: Friday.

MR. GROSSMAN: What time?

MS. CORDRY: Actually I think it was Saturday.

MR. GOECKE: I've lost track of the days. I'd have to double check.

MR. GROSSMAN: I didn't see it. I didn't check --

MR. GOECKE: It might have been, it may have been over the weekend, so --

MR. GROSSMAN: -- my e-mail this morning here --

MR. GOECKE: -- okay.

MR. GROSSMAN: -- and if it came after 7:00 o'clock on Friday, I was gone.

MR. GOECKE: Okay.

UNIDENTIFIED SPEAKER: It was Saturday morning.

MS. CORDRY: It was Saturday morning.

MR. GROSSMAN: All right. Ms. Cordry says it was Saturday morning, so I haven't seen that yet.

MR. GOECKE: Okay.

MR. GROSSMAN: All right. Let's see. Any other preliminary matters? Seeing none, we have Mr. Sullivan resuming his cross-examination today on his rebuttal. You're still under oath, Mr. Sullivan.

(Witness previously sworn.)

MR. SULLIVAN: Yes, sir.

MR. GROSSMAN: And then Dr. Cole, if there is



time. All right, you may proceed, Ms. Rosenfeld, with your cross-examination.

MS. ROSENFELD: Yes, thank you.

REBUTTAL CROSS-EXAMINATION (Resumed)

BY MS. ROSENFELD:

Q Mr. Sullivan, between your January 2013 and your August 2013 reports, as I understand it you made changes to your modeling for several reasons. One was because you changed the, the changed standard for PM2.5, is that correct?

A Between January --

Q January of 2013 and August of 2013.

A There's been a lot of reports. And the standard, I did make changes to them all because of the PM2.5 standard, and I made changes to them all because of the issue with the NO2 conversion. And the third reason I made changes, among others, was the fact that prior in the case, the focus was on the neighborhood school and so forth, and during the time between January and August the focus from my perspective was now on the gas queue and loading dock, and I made changes to respond to those situations.

Q And what has changed between August and, between your August report and your February report of 2014, to cause you to be less conservative in your modeling?

A We, a couple things. One is the, not necessarily



less conservative, but the background change over time, and we accounted for that fact.

And the second major reason is, as I mentioned previously, the December, I believe it was, hearing, Dr. Cole mentioned OLM method. And if you're going less than 100 percent conversion, in his judgment we should use the OLM method. We gave that some consideration and decided, well, okay, we'll model NO2 OLM and the other options that are provided by EPA guidance documents for doing, you know, less conservative more accurate treatments of NO2 for our purposes, and we did so. So that those are the main reasons, the main issues that changed.

Q And there's been a lot of discussion back and forth as to whether or not Dr. Cole actually suggested that you make those changes so that you apply the OLM. Assuming for the sake of argument that he didn't actually make that suggestion, absent that request, would you still have relied on the August report that you submitted previously?

A I don't know. He did make that request, and the record speaks for itself. And I can't reconstruct what I might have done, you know, I don't know.

Q If the only reason was that the background numbers had changed over time, would you have changed your August report?

A Same answer.

MR. GOECKE: Objection, speculation.
MS. ROSENFELD: He's an expert.
MR. GROSSMAN: Well, I know, but usually --
MS. ROSENFELD: I'm asking --
MR. GROSSMAN: -- you can ask an expert a hypothetical on facts that are --
MS. ROSENFELD: I can also ask him, I'm not asking him to speculate as to what others might have concluded. I'm asking what his --
MR. GROSSMAN: I understand. I'm going to let you ask this question, because I don't think it's that big a deal. But you can ask an expert to give, to respond to hypotheticals based on evidence either in the record or that you propose, but this is something a little bit different. But go ahead and pose that question if you know.
THE WITNESS: I don't know what I would have done. I mean I've responded to the circumstances. If the circumstances were different, I may have reacted differently. I'm not going to guess.
BY MS. ROSENFELD:
Q In your opinion, is your February report less conservative than your August report?
A To clarify, it is still extremely conservative, but less conservative than assuming 100 percent of all the NO, NOX, is NO2. That's what you're asking about. For the



other pollutants, some aren't that much different.
Q And so is it your belief that Dr. Cole was asking you to take a less conservative approach in your rebuttal report?
A I mean Dr. Cole's comments speak for themselves. He, on the record we've gone through exactly what he said. My interpretation of that, those statements that he made, was that he didn't agree it was appropriate, in his judgment, to use anything about 100 percent, unless we were to use a method like OLM. In order to try to get closer to the same page, I concluded let's try to meet him halfway, and then let's do it, and so we did.
Q You also explained that part of the reason for your shift in focus was that there had been a change in focus from the neighborhood to the mall. In your mind does the neighborhood mean the school, the pool, and the homes in the immediate vicinity of the mall parcel?
A In my mind those are the closest locations among the neighborhood type receptors to the mall, and the locations that were discussed the most earlier in the case.
Q And earlier in the case, was the neighborhood included in the applicant's definition of the neighborhood for purposes of the special exception application?
A I don't recall.
Q Do you know whether the mall parcel has always



been included in the definition of the neighborhood?
A My definition, I mean I don't, my definition, when I meant to say neighborhood, was the portion beyond the ring road, with the emphasis being to the south. That's how I interpreted the neighborhood.
Q I'm sorry --
A I'm not sure about the official designation of the, for the permit or anything else.
Q I'm sorry, did you say south of the ring road?
A What I said was the, I see the neighborhood as being beyond the ring road, and the focus that we had was really in the southern portion, which is closest to the most gas stations.
Q So in your initial modeling then you really didn't model for emissions levels within the mall parcel, did you?
A You say did not?
Q Did not.
A That is not correct.
Q You included modeling within the mall parcel in your December, in your November 2012 report?
A That's correct.
Q And could you just remind me where?
A Look at any of the plots. The plots show, they clearly had to model, look at the model files. It shows all the receptors we modeled. We had 8,100 receptors, evenly



spaced grid, that included the entire mall complex.
Q But in the figures that you contained in the text and in any isopleths that you might have prepared, did you show those levels in the mall parcel?
A They all showed those levels.
Q And you also showed them for the adjoining roadway network, is that correct?
A We did. I mean 8,100 receptors covered the entire mall plus beyond to the, you know, the different roadways.
Q And do you show the concentration levels on the road network in your February 2014 report?
A We, well, the road network, we show the levels along the southern mall area. The ring road is one of the road networks you're referring to. We do. The focus in the February report was on the mall area and the closest area to the mall, where there was concern there could be potential violations. And that's what we focused on.
Q But did you show any of the perimeter major roadways, University, Veirs Mill, Georgia Avenue?
A We did not, because based upon my interpretation of previous modeling, and move it down here, it was unnecessary to do all these analyses using 8,100 receptors, when we know from past modeling that the concentrations out at those locations will be below the standards.
Q But didn't your original report show violations at

those major road networks? It showed exceedances, didn't it?
MR. GROSSMAN: I'm sorry, I missed the last part of that question. Didn't your original report show violations, what was the rest of that sentence?
BY MS. ROSENFELD:
Q Exceedances along the major roadway network.
A Exceedances of what?
Q Of the NO2 standards.
A Well, I don't recall if it's an isopleth might be up to there, but recall that in the August report we're doing OLM modeling, and at an intersection we know that the ratio of NO2 to NOX from the moving vehicles is under five to 10 percent. And that if a vehicle would idle about five minutes at a light, we're talking maybe on the order of 15 percent. So if, you know, the modeling previously was 100 percent, so if you take that into account, it was clear that those concentrations would be far below the standard.
MR. GOECKE: Mr. Sullivan, you said you did the OLM in the --
MR. GROSSMAN: Whoa, whoa.
MR. GOECKE: I just want to correct for the record that I think he misspoke in terms of which report he did the OLM.
MR. GROSSMAN: You can bring that up on redirect.



MR. GOECKE: Okay.
MR. GROSSMAN: This is cross-examination.
BY MS. ROSENFELD:
Q So that's your opinion, but you don't have that information set out in your report, do you?
A Well, I mean if you, it's my opinion, but also if you look at the references and the report I just did in February, it's very clear that if you're going beyond 100 percent NO2, that there would be no possibility, in my judgment, that the standard would be exceeded anywhere beyond the mall, or on the mall, for that matter.
Q And under the stage one that you reflect in your February report, you show the adjoining rate of growth networks?
A We do not.
Q And had we asked that you include that in your updated report?
A My recollection is I was asked to include that based upon urban dispersion coefficients. And I didn't do that because I don't believe that's correct. I don't believe it's correct to use urban dispersion coefficients throughout that larger grid that we did before.
Q You don't believe that urban dispersion coefficients are the proper dispersion coefficients to use on University, Georgia, and Veirs Mill Road?



A No, this has come up previously in testimony. The issue is dealing with the mall itself, one thing Dr. Cole and I agreed upon was that the mall surfaces are all urban.
Q Correct.
A And we also agreed that if we're going to go out to the larger domain, we're going to follow EPA's Auer method, A-U-E-R, land use method, up to three kilometers. And that clearly is going to be rural. So I didn't see any reason to go against the EPA guidance. And you certainly don't look at one road, you know, you don't look at University. If you're going that far out, you're going to use EPA guidance, and we did. And we showed those earlier. And any, my objective interpretation of our earlier modeling results out past the ring road, especially with due consideration of the actual ratios of NO2 to NOX, this gas station gives insignificant contributions, and there's no basis to interpret, if modeling was done, to assume there's going to be violations.
Q So it's your testimony that beyond the mall parcel, and in particular that queue, you were looking at the surrounding area as rural and not as urban.
MR. GROSSMAN: Which queue?
MS. ROSENFELD: The queue, the gas station queue.
MR. GROSSMAN: So beyond, you're saying if you go beyond the queue.



MS. ROSENFELD: Right.
THE WITNESS: That's not correct. If you go beyond the queue on the mall, the mall is being treated as urban, as it should. And we showed that in the August report. And you're looking at the larger scale. It goes much further out. We're relying upon rural, consistent with the EPA guidance.
MR. GOERKE: Mr. Grossman, I'd like to object. I think this is beyond the scope of what we crossed in rebuttal. She had an opportunity before to talk about the urban versus rural, and we did talk about that at great length, and comparing his early reports, which we'd already done before he testified on rebuttal.
MR. GROSSMAN: I think it is somewhat beyond the scope, but I'm going to give her some leeway in cross-examination. On the other hand, it is becoming somewhat repetitive on the same issue --
MS. ROSENFELD: Well, I --
MR. GROSSMAN: -- so if we can, we've already, he's already gone over what he --
MS. ROSENFELD: -- I'm trying to understand, because I, what, I think what he's saying and what I'm hearing may not be the same thing. Maybe this will make it easier.
MR. GROSSMAN: Michele, be careful of the wire

right there.
BY MS. ROSENFELD:
Q Okay. Taking a look at Exhibit 230, which is the overall illustrative plan dated 7/31/13, if I show you what's inside the special exception boundary itself, you qualify that as urban, correct?
A I qualify everything inside the ring road as urban, as did Dr. Cole.
Q Okay, so everything inside the ring road is urban. What happens when you get beyond the ring road and into the forest buffer? Is that urban or is that rural?
A This kind of land use would qualify as rural land use.
Q Okay.
A And it would be, I mean you're asking very specifically, if you're applying to the, again, to the larger grid, it's what the three-kilometer circle says.
Q Right.
A Because you have many, you have mix and match of land uses out to that distance.
Q I recall the three-kilometer circle. I'm just trying to ask specifically on Exhibit 230 what you consider urban and rural, so that way we don't have this discussion again.
A Well, no, this is --



Q So beyond the ring road to the south you're saying is rural.
A Well, you do the Auer method.
Q Correct.
A The A-U-E-R method. This would be the area, I'm pointing to the south and the residential zone, much of this is wooded, by the way, would be designated as a rural land use. That's one of the inputs for determining the overall dispersion, coefficient of diffusion for a larger scale.
Q And for the purposes of the school, that would be rural as well?
A I would say yes.
Q And the pool area?
A The same answer.
Q And then when you come up beyond the ring road and you're headed northwest toward University Boulevard, do you consider north of the ring road to be rural?
A In all these answers, it depends. I mean basically when you do the Auer, I'm going to explain the Auer method, because I think then we'll be on the same page.
Q Yep.
A You look at how much asphalt, how many driveways, how much forested area. And each one of those categories has a designation, urban or rural. And you categorize the whole three kilometer circle and you add them all up. How



much urban do I have? And if that goes above 50 percent, you're going to call it urban. But in every case it's a mixed bag. So University Boulevard would have obviously asphalt. And the mall parking lot of course is asphalt. And the school has parking lots. So you do your best approximation of those things. So you're when asking each one, what would this be, well, that's how you do it.
Q Well, I think my question is a little more specific than that. You certainly have covered the Auer method. And if you just are looking at the gross three-kilometer area, I think you testified that that overall area is rural. But then you looked at it on more of a micro-scale, applying to this parcel.
My question is in your modeling, did you assume that the area south of the ring road is rural?
A In the modeling that was done this time?
Q Yes.
A We're using urban dispersion, because our focus in here is inside the ring road. This is, it's very slight coverage over in here.
MR. GROSSMAN: Over in here being?
THE WITNESS: I'm sorry, to the south, where the neighborhood is. But this, these runs were based on urban conditions.
BY MS. ROSENFELD:



Q So in your current February 2014 report, you treated the area south of the ring road as urban, is that correct?
A That's correct.
Q And did you treat the area east of the ring road on --
MR. GROSSMAN: You mean west of --
BY MS. ROSENFELD:
Q -- west of the ring road, toward the pool, as urban or rural?
A We treated, as the run done in August of this year was an urban run, everything would be treated as urban.
Q And what about in your February 2014 report?
A August, 2014.
MR. GROSSMAN: You said, he said August.
THE WITNESS: Sorry. February 2014.
BY MS. ROSENFELD:
Q You treated as urban.
A Yes.
Q And for the area southeast, over the pool area, over the school area, did you treat that as urban or rural in your current February report?
A The same answer to all those. We have very limited coverage shown, might not be ours, but beyond the ring road, because our, we have not, frankly I have no

concerns in there based upon the modeling we've done so far. And I was trying to address the issues in the mall which was where the concern was with the gas queue and the loading dock. So that was the focus of those runs.

Q And then going toward the north, University Boulevard, Veirs Mill Road, and down toward Georgia Avenue, did you include those areas in your February 2014 report? Did you do any modeling analysis in those locations?

A Yeah, we modeled the southern ring road. Again, the focus was on the area near the gas station itself, the loading dock, and gas queue.

Q So when is the last time that you modeled the northern ring road perimeter of the mall parcel?

A I would project that would be in August 2013.

Q And in August 2013 did you use urban or rural dispersion coefficients?

A I'm trying to recall. I know we did include urban coefficients. We did some testing. But that was mostly in the southern area. We really modeled the entire area rural back in 2012, as I recall it was, all the isopleth maps were done rural. But back then we showed you the results of the key receptors, both urban and rural.

Q And then again for the areas north of the ring road, do you consider them under the Auer method to be urban or rural?



A I don't have a map to make that judgment right now. I'll say the same answer again. We treated, we had two different types of runs. One was for the area focused on the loading dock, the view of the area right near where the gas station is going to be located, we did general run that did the entire domain including all the roads you're talking about. We used rural for all of the large scale and urban for the close-in to the mall.

Q And so the close-in urban would have been in February 2014 and the larger more rural would have been back in December 2012?

A It was, and the 2012 reports clearly had urban and rural, shown in the tables for the school, the pool, and the homes. And the actual isopleth maps done in 2012 were based on rural conditions.

Q Thank you.

MS. ROSENFELD: Thank you, Mr. Grossman.

MR. GROSSMAN: Certainly.

MS. ROSENFELD: That helps.

BY MS. ROSENFELD:

Q And Mr. Sullivan, do you have your August 2013 report in front of you?

A I do.

Q Okay, if you'd turn to page 24, figure 10, where you ran overall dispersion in the lower quadrant, southwest



quadrant of the mall.

MR. GROSSMAN: Just so the record's clear, which exhibit number are you looking at now?

MS. ROSENFELD: Hold on. Two-fifty-five.

MR. GROSSMAN: Fifty-five?

MS. ROSENFELD: Two-fifty-five.

MR. GROSSMAN: Two-fifty-five. All right.

BY MS. ROSENFELD:

Q I'm looking at figures 9 and 10 on page 34, 24. Do you have it?

A I have it in front of me, yes.

Q Okay. Is figure 10, is figure 9 the figure that you carried over as your tier one analysis?

A Stage one?

Q Your stage one analysis in your February 2014 report?

A With the exception of the background I used, yes. I used a background of 90, which would be the up-to-date background. This one showed a 98, which was the earlier background.

Q My page 24 shows a background of 90.

A Well, this is the, we've discussed this a few times on the record. The 168 shown there is based upon a 98 background. It really should be 160.

Q Okay.



A And version in February shows the 160 in there.

Q I keep getting confused, because it says urban dispersion plus 90 background. So looking down at figure 10, which was your rural dispersion, if you carried that out to the roadways, do the roadways exceed the max standard?

A What road?

Q Urban, under the rural coefficients?

A You're referring to the ring road?

Q No, the University and Veirs Mill.

A No, it would not.

Q And how do you reach that conclusion?

A Well, if you, again, this run is assuming that all NOX is NO2. And I you look at the ring, right just south of the ring road, you'll see like a 170 shown there. And by the time you get to the closest house, you're down to about a 150 microgram cubic meter.

Q That's not my question.

A Well, I'm answering your question. That the gradient is such that if you went to any other major roadway, your concentrations would be approaching background.

Q But going back to Exhibit 230, I'm not asking as you go south, as you continue to go south. I'm asking as you move up toward University Boulevard, toward the northwest and up northeast toward Veirs Mill Road.

A I'm saying looking at the gradients, we've seen this plot, and if you apply those gradings to the north, the northwest and northeast, your concentrations by the time you got to the locations at University or for Veirs Mill, you're going to be approaching background levels, clearly not anywhere near a standard.

Q So is it your testimony that the background levels along these major roadways are the same as the ambient air everywhere?

A No, I'm not saying that. You know, if you go near one of the intersection points, of course that will affect it. What I'm saying is if you look at figure 10, you can see that, for example right very close to the special exception area, we're showing, the last isopleth we show is a 150. I can't, it's surely considered to the northwest, not a very long distance from the special exception area as you get down to 150. By the time you get up into the other areas, it'd be, you'd be substantially lower than that.

My point is if you're meeting the standard right near the source in question, you're going to meet the standards much further away.

Q And the roadways themselves aren't sources?

A I'm not saying they're not sources. The contribution from the gas station --

Q I'm not asking --



A -- operations is very small.

Q I'm just asking what's the overall background concentration. What is the overall concentration when you get to Veirs Mill and University?

A Well, we showed examples in the 2012 reports based on complete, assuming 100 percent NO2. You could take a look at those figures and divide by a factor of four or five after you subtract background, and get a pretty good idea of what the levels would look like.

Q And why would you divide by four or five?

A Because it's not 100 percent NO2. The free-flowing portion is in the order of five to 10 percent NO2. And stopping at an intersection for only five minutes, your ratio would be in the order of 15 percent NO2, such that you actually should divide by a factor of five or six.

Q But assuming you stay with the 100 percent conversion ratio, you're not reducing it by that --

A I'm not staying with the 100 percent conversion ratio.

Q No, I understand that. I'm just trying to understand where you started.

A Well, if I artificially kept the numbers high by assuming 100 percent conversion right at an intersection, where there's essentially no travel time to convert, you'd be over, you may be technically over the standard. But



you'd put a monitor there. Based on looking at, you know, nationwide data, you would not expect to see an NO2 violation.

Q And if we could go to your January 2013 report on page 35.

MR. GOERKE: Again, Mr. Grossman, this is outside the scope.

MR. GROSSMAN: Well, let's hear the question first.

MS. ROSENFELD: This is my last question.

MS. ROSENFELD: If you would look at the isopleth on that page, and look at the roadway grid work and the levels, the concentration levels.

MR. GROSSMAN: That was the January 2013 report, and the exhibit number?

MS. CORDRY: Fifty-six A, 56-A.

MR. GOERKE: Okay. And what page?

UNIDENTIFIED SPEAKER: Thirty-five.

MS. ROSENFELD: Do you have --

UNIDENTIFIED SPEAKER: I don't have a copy of it.

MR. GROSSMAN: Do you have a copy that you want to show the witness?

MS. ROSENFELD: I don't have a court copy.

BY MS. ROSENFELD:

Q Assuming for the moment that it shows numbers as



high as 175 over Veirs Mill Road --

MR. GROSSMAN: One-seventy-five of what?

MS. CORDRY: Micrograms of NO2.

MS. ROSENFELD: Of NO2.

MR. GROSSMAN: All right.

BY MS. ROSENFELD:

Q Of NO2. In your January 2013 report, that was before there was, we realized there was a conversion error, is that correct?

A No. Oh, before the background error? That's correct.

Q Okay. So if that 175 had been corrected for the background error, would those numbers be above the NAAQS?

MR. GOECKE: Objection. Beyond the scope.

MR. GROSSMAN: I'm going to overrule it. This is her last question, she said.

THE WITNESS: Mathematically you could show that it's higher. But my point I just made was if your background is 90, and your number was 175, you know, you subtract from that 175 and you get what, 85? And you divide that by a factor of five or six, and you're down to 15 or so.

MS. ROSENFELD: But I'm not --

THE WITNESS: You're adding that to that 90, you have 105. And you can't look at the older reports that were

done with extremely conservative assumptions, and then try to mathematically show there's an issue when, as shown in more recent reports, you can't do that. It's extremely conservative, and it would not give you a number that could be reproduced by measurement.

MS. ROSENFELD: And all I'm asking is what the number would be --

MR. GROSSMAN: I think you, he's already answered that many times.

MS. ROSENFELD: Okay.

MR. GROSSMAN: I understand the distinction you're making, and the one he's making. You don't have to do it again.

BY MS. ROSENFELD:

Q All right. Mr. Sullivan, just from a global point of view, looking at the, in particular the stage two and the stage three analysis that you did in your February 2014 report, assuming for the moment that this analysis were going to go through an EPA review, what would the level of expertise and background and experience of the EPA reviewer or regional office reviewer have in looking at that report?

MR. GOECKE: Objection. Calls for speculation.

MR. GROSSMAN: No, I think he answered that based on his knowledge of reviews of models before, so I'll overrule that.



THE WITNESS: The regional offices, well, first of all it'd go to the State to review. The EPA would then oversee what the State did. And at both levels they have competent meteorologists and air quality specialists who can interpret the issues that end here.

BY MS. ROSENFELD:

Q So they would have education and professional training specific to the types of analysis that you produced in your rebuttal?

A Well, each one has different degrees and different training. My point is they, from my experience in working with regional meteorologists, for example, in the various regions, including Todd Ellsworth in region three, regional meteorologist, these are experienced meteorologists that have done modeling for a long time, and they have the ability to read technical reports, and including issues they haven't dealt with specifically before, and make informed judgments. So I'd say yes, EPA is technically competent to review issues like this, and do all the time.

Q I'd like to refer you for a moment to the California Air Pollution Control Officer's Association guidance document that you referenced on page 29 of your report. Do you have a copy of that with you?

A CAPCOA?

Q Yes.



MR. GROSSMAN: Twenty-nine of which report?

MS. ROSENFELD: Of his February --

MR. GROSSMAN: 2014 report?

MS. ROSENFELD: February 2014 report.

THE WITNESS: I don't have a copy with me, but again I'd like to ask Mr. Grossman, do you have a copy of that report?

MR. GROSSMAN: This is your rebuttal report she's referring to --

THE WITNESS: Correct.

MR. GROSSMAN: -- 66.

THE WITNESS: The CAPCOA 2011 is a reference relating to modeling NO2. And I believe it's available here. It's certainly a widely available document.

MR. GROSSMAN: What page are you on, Ms. Rosenfeld?

MS. ROSENFELD: Oh, it's referenced on page 29 of the rebuttal report.

MR. GROSSMAN: Okay.

MR. GOECKE: Are you asking if he has a copy of his report, or the CAPCOA document?

MS. ROSENFELD: Of the CAPCOA document.

MR. GOECKE: You don't have copies of that?

MS. ROSENFELD: I brought a copy for the record. I asked you last time if you would plan, if you would plan



to bring copies of all of the reference materials in his report.

THE WITNESS: I have most of them. I don't think I have CAPCOA. But if you have a question, if I could have a look at your copy, I'll try to, be happy to answer it.

MS. ROSENFELD: Mr. Grossman, I do have a copy for the record, and then I have my copy that perhaps Mr. Sullivan and I can share.

THE WITNESS: All right.

MR. GROSSMAN: Please watch out for the wires.

MS. ROSENFELD: You know what? I'm going to go that way.

MR. GROSSMAN: Yeah, why do we need to have that set up when we're not using it, is my question. When we use it, you can have it set up, but I'm afraid of having those wires stretched across the room.

MS. ROSENFELD: Oh, okay.

THE WITNESS: Which part does your question pertain to?

MR. GROSSMAN: Mr. Brown, if you'd just -- hold on one second. Just disconnect it, unless it's blocking, if it's blocking the path. I can't see down the path from here, but. And then if you need to use it, we can reconnect it.

MS. ROSENFELD: I was going to start on page 7.

Do you have page 7?
MR. GROSSMAN: Is this being marked as an exhibit?
MS. ROSENFELD: Yes.
MR. GROSSMAN: Okay, so this will be --
MS. ROSENFELD: Actually I can run a copy of this one.
MR. GROSSMAN: This, oh, I thought --
MS. ROSENFELD: You have an entire copy. I have an entire copy. Mr. Sullivan has --
MR. GROSSMAN: Well, I'll let him use my copy once we mark it as an exhibit, if you want, if that'll help.
MS. ROSENFELD: Actually I can share mine.
MR. GROSSMAN: Okay, so this'll be Exhibit 567. And that is modeling compliance of the federal one-hour NO2 NAAUS by CAPCOA, which stands for California Air Pollution Control Officers Association, and that's Exhibit 567.
(Hearing Exhibit No. 567 was marked for identification.)
MR. GROSSMAN: All right, so what page?
MS. ROSENFELD: Okay, I'm going to start, I'm now on page 7.
MR. GROSSMAN: Okay.
BY MS. ROSENFELD:
Q And on page 7, under section 3.3, there's a section that's titled selecting the appropriate tier



approach. Do you see that section?
A I do.
Q And under it it notes that, quote, there are several options available to demonstrate compliance with the one-hour NOX standard.
A NO2 standard is what it says.
Q NO2 standard. Not all options may be allowed by all agency, is that correct?
A You're reading exactly what it says.
Q Okay. And so in fact under ordinary circumstances if an applicant has to obtain a permit, the regulatory agency would have the expertise to know what questions to ask and what additional data might be required in order to authorize use of the, some of those options, is that correct?
A Well, to clarify, if your permit was required, then the State, with EPA oversight, would have reviewed the modeling protocol and would approve all options, including whatever decisions are made on NO2 modeling.
Q And they would have an idea as to what policy judgments they would want to make with respect to how conservative they would be in allowing use of those alternative options?
A Well, they would make whatever judgments they deemed were appropriate.



Q And do they have the right to full discovery of what your modeling analysis includes?
A They would certainly have the modeling files, the protocol, the modeling results, output files, input files, whatever they wanted.
Q And do they have the authority to make you provider further information, or run the model in different ways?
A Well, they certainly have the authority to approve or disapprove the modeling. If they specify it should be run a certain way, if you didn't run it that way, I would presume that you would not get your permit.
Q Or they could ask that you use different inputs in your modeling assumptions?
A Certainly.
Q And that process in fact is very different from the situation here, is that correct?
A Yes, because this matter did not require an agency such as MDE or EPA to have a permit, air quality permit, so there's no review conducted.
Q So in this case the hearing examiner or the Board of Appeals have to determine if your modeling analysis is reasonable, based on what you've provided, is that correct?
MR. GOECKE: Objection. Calls for a legal conclusion. And this also goes again beyond the scope of



rebuttal, and we've been through this before.
MR. GROSSMAN: I agree. I sustain that. And I guess I'd ask this question, since you're into this area. When you, going through a permit process, do they have cross-examination of you under oath?
THE WITNESS: They do not.
MR. GROSSMAN: Do they have witnesses come in to testify under oath, expert witnesses?
THE WITNESS: No, sir.
MR. GROSSMAN: All right. See, yes, the process is different, but each process has its own methodology of achieving some approximation of truth. So you are stuck with the process that is here. That is, you have a hearing examiner listening to evidence, and you have cross-examination of what he's presented. You have your own expert witness on these points. And so that gives you that level of security. And when it's done by the EPA or the State, they have a different process. We have the process we have here. So I think you can move on.
MS. ROSENFELD: I understand. I just want the record to be clear as to the distinctions.
BY MS. ROSENFELD:
Q I do have one other question about the EPA process. Are outside parties allowed to come in and participate or make comments during the permit process?

A I think it depends. I haven't seen that on typical permits I've helped obtain. I won't say it never happens. On a large controversial air quality project, that certainly could happen. The answer is I don't, I haven't seen one. I won't say they won't do that.
Q From an overall perspective I'd like to walk through the process that you go, that you went through in order to come up with your stage two and stage three analysis.
A Ms. Rosenfeld, did you finish with the CAPCOA document?
Q I'll have more questions about it later --
A All right. I'll leave it here.
Q -- so you can hold onto it, or I can take it back for that.
The initial step is to pick the model that you use, correct?
A Well, that's one of the initial steps, yes.
Q And in this case the choice really was between MOVES and MOBILE6?
A You're talking about emission models now.
Q Yes.
A I thought you were going to -- those are, those certainly are two choices.
Q Okay. And you picked MOBILE6?



A Well, at the time of this project in 2012, the original report, that was the recommended, that was the model of choice.
Q And then you select your inputs into the model, correct?
A We do.
Q And that includes the number of vehicles?
A That's correct. Among other things.
Q And the locations where they'll be operated?
A No.
MR. GROSSMAN: How is this within the scope of the rebuttal direct?
MS. ROSENFELD: It's a --
MR. GROSSMAN: I've given you a lot of leeway, but really, we can't --
MS. ROSENFELD: It's in order --
MR. GROSSMAN: -- go over the entire cross-examination of this witness's original direct here.
MS. ROSENFELD: His report is presented as an alternative methodology, and my questions --
MR. GROSSMAN: Which report?
MS. ROSENFELD: His February 2014 report.
MR. GROSSMAN: Right.
MS. ROSENFELD: And my questions are going into the methodology or the analysis that he used in creating his



methodology for stage two and stage three.
MR. GROSSMAN: But it seems to me you're going back to step one, rather than anything that came up in the rebuttal testimony. Can you point me to the part of the rebuttal testimony that this touches on, or that this is responsive to? You're already cross-examined him, and he's been cross-examined at great length previously. So this rebuttal cross-examination should be addressed to things that were raised during rebuttal, rebuttal direct.
MS. ROSENFELD: And one of the questions is how did he come up, how did he derive his OLM analysis in stage two and in stage three, and --
MR. GROSSMAN: All right, so this is restricted to the OLM analysis.
MS. ROSENFELD: This is, as I said, this is --
MR. GROSSMAN: That's, I don't think you said that.
MS. ROSENFELD: -- this is for his stage two, which is his ozone limiting method --
MR. GROSSMAN: Okay.
MS. ROSENFELD: -- and stage three, which he identified as something other than was already levelled.
MR. GROSSMAN: All right. Go ahead.
BY MS. ROSENFELD:
Q You say the modeling does not include the



locations where vehicles will be operated?
A You're asking about running MOBILE6 is what you're asking for? That comes up with emission rates, and those are then applied to the locations. But to clarify, the MOVES and MOBILE6 treatment, the roadway counts and so forth, are not changed. That was not modified.
MR. GROSSMAN: In other words your February 2014 rebuttal report didn't modify the MOBILE6 versus MOVES choices.
THE WITNESS: Correct, but the only exception being we did factor some things up, as I stated. But the gas queue, we increased the PM2.5 emissions by a factor of 10, to address the fact that MOVES is higher. And we described, you know, why we did not scale up the loading dock, for various reasons. But the actual running of MOBILE6 was not repeated for the February 2014 report.
BY MS. ROSENFELD:
Q Did you make any modifications to your Mobil 6 runs?
A We did not.
Q Did you model fast food emissions, or any other localized source of emissions in stage two or stage three?
A Localized source of emissions. Well, we modeled the ones that, we modeled the ones that we modeled back in 2012 and 2013. We modeled the roadway segments. We modeled

the parking lots, the garage, ring road, all the gas station sources and the loading dock sources.
Q But you didn't model all of the parking lots in the mall?
A We modeled the southern, well, the parking lot that was in close proximity to Target and Costco, and the parking garage to the east.
Q And in your 2014 report did you update your traffic congestion levels in light of evidence and testimony in this case that there would be more traffic and congestion on the mall parcel than originally shown?
A I think we addressed that at the last hearing. My answer hasn't changed. I mean we modeled, we modeled, did our modeling. We considered the queues, as we did before, at stop signs, intersections, the various points you asked. We had queues there. We didn't change it. It's the same.
Q And prior to the rebuttal report did you make any adjustments for NOX in light of your selection of MOBILE6?
A Did we make any changes? This is going back to the 2012 report.
MR. GOECKE: Again I would object.
MR. GROSSMAN: Would you repeat that question, because I didn't --
BY MS. ROSENFELD:
Q Did you, prior to the rebuttal report, did you



make any adjustments for the fact that you used MOBILE6, in the context of NO2? I believe you had an adjustment factor of 10 for PM2.5, correct?
A Well, this is going back to do with my testimony last year.
MR. GROSSMAN: Well, hold on a second. I'm going to overrule the objection. But let's not go too far in this again.
MS. ROSENFELD: I'm just --
MR. GROSSMAN: Now you're talking about prior to --
MS. ROSENFELD: It's very simple. I'm trying to compare what he did before with what he's doing.
MR. GROSSMAN: I understand, and that's why I'm allowing it.
THE WITNESS: But what I said last summer, frankly, is that I simply modeled using MOBILE6. I acknowledged that I agree with Dr. Cole that on the gas, the gas queue, particulate emissions were higher with MOVES. And I said well, if we were to take that into account that the highest impacts for the closest home would go from .005 micrograms per cubic meter to about .05. And so while I didn't specifically model it that way, I certainly acknowledged the point and put it in mathematical terms.
BY MS. ROSENFELD:



Q And did you make that adjustment on the mall parcel for PM2.5?
A Did I make an adjustment? I was referring, the example I gave was for the closest home. There was an annual standard, and the closest home, the annual standard was what I was talking about.
Q And do you remember if you made that adjustment for PM2.5 in the mall parcel?
A Again, I described it for the closest home only.
Q And then in your prior report did you make a similar adjustment for NOX or NO2, based your selection of models?
A Same answer. I mean as I said, we did not, the modeling was not changed for the MOBILE6. I discussed an interpretation.
In terms of NO2, to clarify the record, I did agree with Dr. Cole that on a fleet basis that NO2 was higher with MOVES than it was with MOBILE6.
What didn't come out in the record last year, they looked at that closer, that a lot of those, the factor of two is because in fact there's a 20- or 30-fold difference between MOVES and MOBILE6 that's in diesel emissions. And if you look at the gas station queue, that gas station queue is gasoline vehicles. And for the gasoline vehicles, MOVES is in fact lower by about 20 percent, 20 to 30 percent in



the literature, than MOBILE6. So there was no need to scale up those sources, there was a need to scale down to match MOVES.
Q So in your August 2014 report had you scaled anything up?
A As I've answered --
Q The NO2.
MR. GROSSMAN: In the August 2013?
BY MS. ROSENFELD:
Q In the August 2013 report did you scale up NO2?
A Other than the fact that the testimony that I just gave, that I did the math on the stand, the modeling was not based on scale-up. The modeling was direct.
Q And did you correct, your testimony correctly that in the rebuttal report in fact you have scaled down for NO2?
A I scaled down for NO2 one hour, that's correct, by 20 percent.
MR. GROSSMAN: Because of the distinction between the fleet?
THE WITNESS: Correct. I had multiple references that confirmed very clearly that MOBILE6 had higher, 20 to 30 percent higher emissions for gasoline vehicles than did MOVES. So to be consistent, I scaled. One went up for PM2.5, and NO2 went down a little bit.
BY MS. ROSENFELD:

Q And then after you've gone through those input steps, you need to select a dispersion model, correct?
A I didn't, I already, that selection had already been made. I mean we're using AERMOD for this project.
Q Okay. And then beyond that though it's the urban versus rural, correct?
A We're using the same treatment as August. It's urban for that set of receptors.
Q In your rebuttal report you, do I understand correctly that you conclude that the rural dispersion characteristics to the south of the mall parcel would be overtaken by the urban dispersion, and you do that based on a formula from a report called Panofsky, or a Panofsky article that you reference?
A That's one reference. There's others that show very similar things.
Q Can you tell me what in addition to the Panofsky article you referenced are other sources?
A There are other sources. I didn't reference them all, but if you look at, I mean I have references, Raynor, R-A-Y-N-O-R, 1979, would be an example, where they, where he showed in there approximately a one-to-three to one-to-four front ratio. It means for every four feet you go, you're going to, the point where it's equilibriating would be one meter, one foot above the ground. So if you, it's one-to-



four slope that that's about what I showed here.
Q But that's not referenced in your report, correct?
A No, but you asked me other references.
Q No, no, no, no, no. I asked you if --
MR. GROSSMAN: No, you asked him on what other things he relied on, and I think he's --
MS. ROSENFELD: No, I asked him if there were other, I asked him if there were other references in his report.
MR. GROSSMAN: I don't remember you saying in his report, but it doesn't really matter. He can answer that question. Were there other references in the report that you relied on?
MS. CORDRY: Well, but those are ones we haven't been provided then.
MS. ROSENFELD: Right.
MS. CORDRY: So he can, I mean he can bring up as many references as he does, but now we're sitting here --
MR. GROSSMAN: Well, that's okay. I mean he can say in answer to a question as to are there, he mentions one source, on report he relied on. He's asked a question are there other things you relied on.
MS. ROSENFELD: But that was --
MR. GROSSMAN: And yeah, he was asked a question were there other things you relied on, whether or not you



had the addition of in his report to me is not particularly relevant. The point is that he's asked were there other things he relied on, and he said yes, there's this other report that I relied on. He doesn't have to list everything, every basis for his knowledge in his report, does he?
MS. CORDRY: I understand, but it does make it much more difficult to cross-examine when someone comes up with new references.
MR. GROSSMAN: Well, except that you have every opportunity to look at his report, have your expert analyze it, pull out every report that could possibly pertain to it, and cross-examine on it. He doesn't have to know, there's no requirement anywhere that everybody list every piece of information that they have studied in their lifetime that causes them to reach a certain conclusion.
MS. ROSENFELD: If I could just remind the witness of my question.
MR. GROSSMAN: Yes.
BY MS. ROSENFELD:
Q Do you reference any other sources in your rebuttal report, other than the Panofsky article, as the basis for the transition between the rural dispersion characteristics south of the mall parcel, and the more urban on the mall parcel?



A I used the Panofsky 1984 reference as an example, and like I said, these levels are very consistent with the literature, other things I've reviewed.
MR. GROSSMAN: But she's asking you are there other, did you list any other references in your report?
THE WITNESS: I did not.
MR. GROSSMAN: Okay.
THE WITNESS: I did not.
BY MS. ROSENFELD:
Q And the Panofsky formula is not part of any standard EPA guidance, is it?
A Panofsky, I don't recall seeing that in the EPA guidance, but it's in a peer-reviewed book.
Q And what book is that? Do you know?
A I gave the reference. Panofsky and Dutton, 1984, published I believe in, apparently I don't have it on the list. Panofsky and Dutton, is it Atmospheric Turbulence? My applications, I believe --
Q I'm sorry, I didn't hear that.
A Atmospheric Turbulence.
Q Okay.
A By Panofsky and Dutton. I believe it's been referenced in previous reports I've had, I've done. It was published I believe in 1984, John Wiley & Sons I believe is the publisher. I believe it was published in New York City.

And I believe it was mentioned earlier, in previous reports.
Q Is this a source that you got from the Library of Congress?
A I've had that text for a long time.
Q You evaluate a number of pollutants in the rebuttal report, including PM2.5 and CO, is that correct?
A That's correct.
Q And with those two pollutants you just are measuring them directly. You're just looking at specific --
MR. GROSSMAN: I'm not understanding that question.
MS. ROSENFELD: You're looking at direct numbers, pulled from monitors.
MR. GROSSMAN: When you say he's looking at, do you mean his rebuttal report?
BY MS. ROSENFELD:
Q Yes, in the rebuttal report. Your concentration levels?
A I'm directly modeling without conversion --
Q Right.
A -- is that what you mean? CO and PM2.5.
Q And with respect to NO2, you're not measuring that directly, but you need to evaluate a mix of compounds, is that correct?
A You mean modeling it directly?



Q Mm-hmm.
A What we're modeling, NOX is being converted to NO2.
Q I'm sorry, I didn't hear that.
A The modeling emission rates are for NOX, and that's been the model through OLM or OLM group. It's modeling the NO2 fraction.
Q In this case you're deriving your ultimate concentrations through a combination of NOX and ozone, correct?
A The ozone is certainly input to the model, but then uses that as an input to estimate NO2 levels.
Q We've discussed that the EPA has a tier one, a tier two, and a tier three. And you went straight from tier one to tier three, correct?
A That's correct.
Q Would it be reasonable to conclude that the tier two method would show considerably higher results than what you've calculated with tier three?
A I think tier two would show higher, but if we were to run that, my expectation would be less than the standard. It would be closer, but I think it would be less than the standard.
Q But you didn't run that model, correct?
A No.



Q When you finally do get to this, the tier three analysis, it's not a one-step calculation, is it?
A One-step, what is a one-step calculation?
Q Well, first you have to come up with a ratio for the initial combustion, the primary NO2, or what I'll call the tailpipe NO2, is that correct?
A They call it in-stack ratio. It's an input to AERMOD.
Q And you describe at page 29 the study you rely on to come up with that 25 percent ratio, is that, that 25 percent stack number, correct?
A We're referring to CAPCOA as a basis for coming up with a conservative in-stack ratio for all NO2 combustion sources.
Q And that's what you talk about in the first couple of sentences of the full paragraph on page 29, is that correct?
A We mention CAPCOA, among other things, and we describe more specific references that provide more specific information.
MR. GROSSMAN: Once again, you're referring to Exhibit 466 now, the rebuttal report, page 29.
BY MS. ROSENFELD:
Q And you said you were applying that 25 percent ratio to cars in the queue and for 40 meters beyond the



receptors in the queue, is that correct?
A Well, just to clarify, we're talking about the in-stack ratios.
Q Mm-hmm.
A We're using 25 percent, you know, as our number. And as I indicate in here, in most cases that's highly conservative. But if you're asking me now what about, you're going beyond the in-stack ratios. You're asking about the 40-meter zone?
Q No, I'm trying to understand what geographical area you applied the 25 percent tailpipe ratio for. Is it just for the cars that are in the queues?
A It's called an in-stack ratio. It's cars in the queue. It would also be for trucks at the loading dock. We can certainly put them at 25 percent, even though CAPCOA shows that heavy-duty diesels are at 11 percent.
Q So it doesn't apply, you're not applying that to the cars in the ring road?
A We're applying 25 percent to the cars in the ring road.
Q And in the parking lot?
A Cars driving, all NOX emissions in this case from motor vehicles, we're using 25 percent conservatively.
MR. GROSSMAN: I didn't quite understand something. I thought you said it was for the, this in-stack

ratio was for the queue and for the loading dock. Does it also include the cars in the southern ring road --

THE WITNESS: Yes, sir, it does.

MR. GROSSMAN: -- and the parking lot?

THE WITNESS: It includes the parking lot, the parking garage, travel in the ring road, University.

MR. GROSSMAN: Okay.

THE WITNESS: That ratio is used for everything, free-flow and queues.

MR. GROSSMAN: Okay.

THE WITNESS: It could be, you know, to simplify the analysis and make it conservative.

BY MS. ROSENFELD:

Q And is it all parking lots?

A We didn't model the northern parking lots, because they're too far away to be significant.

Q So basically it's whatever motor vehicle sources you've been modeling throughout.

A To clarify, if you refer to the November 2012 report, it has pictures showing exactly what the model, which part of the, which loading, parking lot, which garage and so forth. That hasn't changed.

Q Okay. And so all of those sources from your December 2012 report, you've applied the 25 percent in-stack ratio.



A For NO2, correct.

Q For NO2, okay. Okay, so then in addition to that 25 percent in-stack tailpipe ratio, you also have another formula that you use to model the remaining 75 percent of the NOX, is that correct?

A I'm not sure what you mean.

Q Well, let's assume that there's 100 units of NOX that comes out of a tailpipe.

A Mm-hmm.

Q You're assuming that 25 percent of that is immediately, comes out of the tailpipe as NO2, correct?

A It starts, that fraction starts as NO2. It is NO2.

Q Starts as NO2.

A And stays there.

Q Okay. So then that leaves you 75 units of NOX.

A Yeah, and it's basically NO.

Q NO. Then you have a separate formula that you use to model what happens with that remaining, those remaining 75 units, correct?

A Which, you're referring to stage two or stage three?

Q Well, we need to go through both, so let's start with stage two.

A Stage two is being done directly by the OLM



method, so the model is internally computing how much of that NO versus NO2 each hour, based on how much ozone is present in the air.

MR. GROSSMAN: And just for clarity of the record now, we're not talking about tier two, we're talking about on your, in your rebuttal report you used the term stage one, stage two, and stage three. We're talking about stage two from the rebuttal report.

THE WITNESS: That's correct.

BY MS. ROSENFELD:

Q And in stage two, you've identified this area that is 40 meters outside beyond the queue area, right?

A Correct.

Q And I'm just going to call that the tailpipe box, unless you've got a better, just so we know what we're talking about --

A Okay.

Q -- an easy way to refer to that --

A Tailpipe box, all right.

Q -- 40 meter area. Are you assuming that there is any hour by hour conversion occurring within the tailpipe box under stage two?

A Certainly. There is conversion occurring from sources other than the gas queue and the loading dock. All other sources are assumed, their impacts are assumed to be



converting by the OLM method.

Q And then so that, and that OLM method is also applied outside of the tailpipe box, correct?

A Correct.

Q That's just being modeled directly by the program.

A Correct. For all sources.

MR. GROSSMAN: What about the other 75 percent of the emissions coming out of the tailpipe box? Are they also analyzed by this method, or what do you do with that?

THE WITNESS: The model itself internally does it. And we've done the, a very conservative way of using, there's two options to do this. One's called OLM. The other's called OLM group. When you use OLM it considers ozone separately for all the sources. It doesn't consider overlapping issues, which are significant here. So that if you use the OLM method, at each source it independently sees how much ozone is there this hour, and if there's 10 micrograms of ozone, it'll convert 10 micrograms of NO2, if there are 10 micrograms of NO rather, it'll convert the NO to NO2. If there's less than 10 available, then it'll convert what it can. And that's a procedure that's done internal to model. We don't do that. The model is doing that.

BY MS. ROSENFELD:

Q If I look at page 7 of your rebuttal report, in

the last, near the bottom of the first full paragraph, you talk about how the ratio of NO2 to NOX is much less than 100 percent. Is that something that is addressed directly in the model, or is that a formula that you have come up with?

A You're referring to the page that says even then the ratio of NO2 to NOX is much less than 100 percent?

Q Mm-hmm.

A Well, that's what that particular reference, those references show. Atmospheric Agency, 2007, Janssen 1986. And I probably gave four or five others in this document that show the same thing.

Q And if I were to take a look at appendix B of your rebuttal report, it starts on page 27, I think on the bottom of 27 you refer to that same Janssen, you also refer to a Janssen report, is that correct?

A I do.

Q Summary of Janssen, and then I think there's some perhaps additional references further on. Here's my question. When you're looking at the conversion factor for the conversion of, the hour by hour pairing, and the conversion of NO to NO2, you have to use a certain formula in order to figure how fast that's going to happen, is that correct?

A The, are you talking about AERMOD?

Q No --



A Are you talking about these references?

Q -- I'm talking about your discussion here on page 7, where you talk about, you assume a starting ratio of NO2 to NOX at a source, and then you have a conversion of the remaining fraction of NO to NO2 on a one-to-one basis, using ozone concentrations. I assume there you're talking about that sort of remaining 75 units that we have left over.

A That's correct.

Q Okay. How did you come up with the conversion that you used for that remaining 75 units?

A We don't. The conversion in stage two is based on the AERMOD dispersion model, but the OLM treatment and the model is doing that internally.

Q Then could you explain to me why there's this discussion here of the Atmospheric Agency report and the Janssen report? If AERMOD makes those conversions automatically, why do you have these source references?

A Well, because of the fact that the OLM method was developed for stacked sources, and much of the testing has been done for stacked sources, our plant's certainly well represented in the literature. I'm showing, and I can certainly show with the projector, examples of this from three or four reports, that the amount of time required to convert NO to NO2 in a power plant pump, where they had a lot more ozone than we had during our time periods of these



peak modeling for this gas queue. A lot more potential for conversion, and a lot more mixing going on than we had mixing going on in ours. A lot more potential, probably 10, 20 times more potential for mixing of the ozone with the plumes, that they were converting in, you know, after going 10, or two or three kilometers, they're converting 10 or 15 percent of the NO2 to, the NO to NO2. Tiny, tiny fraction.

My point was I used Janssen '86 as an example to say what has to be more than 40, I'll conservatively set it at 40, it's probably more like a couple of kilometers. But to have it tractable I'll use 40 as my basis. But these references show it's much, much more than that.

MR. GROSSMAN: Use 40 what?

THE WITNESS: Meters, so there was I set the zone where if you have your gas queue, we know it's not, it's not converting inside the source itself, and so we set the gas queue up at 40 meters around that gas queue loading dock zone. We say well, based upon the literature, clearly there's probably zero conversion, and certainly not, no significant conversion happening that fast. Six kilometers, I used the formula in Janssen '86 to show that, you know, at 40 meters you would still be at six percent. And in the range for a power plant, initial in-stack ratio is five to 10 percent. So it had not simply converted all at that distance. I used that as a very conservative benchmark. It



could have been 100, 200, 300 meters. I used 40 meters to very conservatively address it.

BY MS. ROSENFELD:

Q So you used the Janssen report and this Environmental Agency report, Atmospheric Agency report, and maybe some others, to extrapolate that 40 meter perimeter that you drew, is that correct?

A I used Janssen. Janssen had a formula that I could extrapolate it back to 40 meters.

Q Okay.

A Plus interpretation of not just the ones listed here, but I've identified others where they had studies that have been done. It's on my data disk on your references. I had a number of them that I can describe to you, that said the same, show the same thing.

Let me tell you what those are. Carmichael and Peters, 1981, would be an example. And I can show you these on a screen if you'd like. Another example, let me get my list out. But if you look on that data disk, there's quite a number of them that would show you similar kind of things. Janssen '86, Janssen '88, let's see what else. Shu, S-H-U, 1978. Peters and Carmichael, 1977. These are all showing very similar things. But the common pattern is it takes kilometers at a time for that conversion to take place. And a power plant plume has kilometers before it touches down

and creates maximum impacts at ground level. It has to mix down to the ground first. It has two or three more kilometers to mix, and it does.

Q And that brings me back to a question I asked earlier, because maybe I misunderstood. In your stage two analysis, did you assume that any of that mixing was occurring within the tailpipe box?

A Is your tailpipe box, you're referring to the, outside the gas queue itself, loading dock. Outside the source, for the immediate zone around the source?

Q Right, that's --

A I'm assuming no conversion takes place. Remember, I'm starting at 25 percent --

Q Right.

A -- level.

Q That's what I thought I asked.

A And as I described in here, actually the rate is even lower than that. The in-stack rate is lower than that, based upon Lenner and Lindquist's reference.

Q Okay, so you're assuming the 25 percent direct tailpipe emission within the tailpipe box, which is the queue plus the 40 meters.

MR. GROSSMAN: You mean by a 25, when you say 25 percent direct tailpipe emission, you're saying he's assuming a 25 percent conversion to NO2 --



MS. ROSENFELD: That's correct.

MR. GROSSMAN: -- in the tailpipe box.

MS. ROSENFELD: The in-stack ratio --

MR. GROSSMAN: Right.

MS. ROSENFELD: -- I think is what he's been calling it.

MS. CORDRY: Well, actually not the tailpipe box. Coming out of the tailpipe.

MR. GROSSMAN: No, well, he's, as I understood the earlier testimony, he's included within that box 25 percent conversion rate of everything within that box. And that box is defined out to the 40 meter line. That's my understanding.

THE WITNESS: Let me clarify.

MR. GROSSMAN: Is that --

THE WITNESS: It's a little different than that. I mean basically we're saying the in-stack ratio is 25 percent for all the sources. That doesn't change.

MS. ROSENFELD: And that's what's coming out of the tailpipe.

THE WITNESS: Correct.

MS. ROSENFELD: That's what's just blowing out of the exhaust.

THE WITNESS: Exactly. We think it's less, we show why it's a little bit less than that. It's about 20



percent for the idling cars in the queue, but we're using 25 as a benchmark number. That's what it is. But inside the zone from the source itself, going out 40 meters --

MR. GROSSMAN: Right.

THE WITNESS: -- the zone around that, we're saying in there that for the loading dock and gas queue only, we're restricting that to 25 percent because there's not enough time for mixing to the molecular level for sure in that zone. But for every other source, including the ring road that's right next to that, those receptors, we're using OLM directly.

MR. GROSSMAN: Okay, then I misunderstood. I thought I asked you whether or not that 25 percent conversion applied to the cars in the parking lot and the ones on the immediate vicinity in the ring road, within that 40 meter thing. And you, I thought you said yes to that.

THE WITNESS: It does. The in-stack ratio coming out of the tailpipe is always at 25 percent in this modeling, for all the sources between the parking lot and the parking garage. But we're referring to a zone here around, it's a rectangle you could draw around the gas queue going into that source.

MR. GROSSMAN: I understand, but so how far out does that in-stack ratio go? If you're not talking about the full 40 meters for that, how far out are you taking that



in-stack ratio that you're applying?

THE WITNESS: The in-stack ratio is applied throughout the modeling grid. That doesn't change. What changes is how much potential is there to convert the NO, the residual NO to NO2.

MR. GROSSMAN: Okay, but I'm not making my question clear. You've talked about this box that goes out 40 meters. You also talked about the in-stack ratio that you're applying being 25 percent. Then I thought I asked you, and maybe I didn't make that question clear, whether or not that 25 percent in-stack ratio conversion was applied to all emissions within that 40 meter box. And I thought you said yes to that, but now I'm hearing you say something different.

THE WITNESS: I'm sorry. Within the box, within inside the box we have the gas queue and the loading dock.

MR. GROSSMAN: Yes.

THE WITNESS: Those are the only sources that we don't modify beyond the 25 percent. They stay at 25 percent in that box.

MR. GROSSMAN: Okay.

THE WITNESS: But all the sources that contribute, including the ring road and the parking lots, what have you, those are straight OLM.

MR. GROSSMAN: Okay.

THE WITNESS: Inside the box, outside the box.
MR. GROSSMAN: Okay.
MR. GOECKE: Mr. Grossman, may we step outside the box and take a brief break now?
MR. GROSSMAN: Yes. Yeah, okay, we'll come back in five minutes.
(Whereupon, at 10:59 a.m., a brief recess was taken.)
MR. GROSSMAN: Okay, back on the record.
MS. ROSENFELD: Thank you. Mr. Grossman, I do appreciate your patience. It's complicated, and I'm still trying to understand some of the nuance here.
BY MS. ROSENFELD:
Q Going back to the, Mr. Sullivan, going back to the tailpipe box, I think I understood you to say that for the emissions coming from the queue and the loading dock, it's the flat 25 percent tailpipe in-stack emissions.
A That's correct. For all the receptors that are inside that location, that's either inside the source or 40 meters happens to be one area source width away from the source, the gas queue source, for all those receptors, for all those receptors and just for the loading dock and the gas queue, we strictly use 25 percent. We do not modify OLM at all, because there's nowhere near enough time to convert. So that's the assumption. All other sources affecting that



box, the ring road, all the rest, they're straight OLM. There's no difference.
BY MS. ROSENFELD:
Q Okay. So if there's a car in the parking lot that emits some NO2, some NO and it drifts into the box, you apply the OLM --
A Correct.
Q -- conversion factor to that.
A Yes, we do.
Q Okay. And that's the case for both your stage two and your stage three --
A No.
Q -- analysis? This is only stage two?
A Stage, we're talking about stage, for stage two that is the way it is done. Stage three is done differently.
Q Okay. Could you explain to me how it's handled in stage three?
A Stage three is the gas queue and loading dock effects on the box. The tailpipe box, as you're referring to it, is the same.
Q Yes, I thought the treatment inside the box.
A Is the same. Stage two, stage three.
Q Okay. That was my question.
A The treatment of those two sources is the same.



Q Of the queue and the loading dock.
A Correct.
Q And what about for emissions outside of the tailpipe box that drift into the box? Is the treatment of that the same?
A It is not.
Q How is that treated?
A We assume very conservatively, based on all these references I provide here, that they have 50 percent conversion of their emissions for, affecting the box and for locations outside the box, it's 50 percent.
Q So emissions from, for example, the parking lot, that disperse into the box, you assume a 50 percent conversion ratio, correct?
A Correct.
Q And for emissions that are generated by the queue and the loading dock that disperse beyond the tailpipe box, you're assuming a 50 percent conversion ratio for those as well?
A That's correct. Which like I say, we have tested that. That's a very conservative approach, relative to the approach using OLM outside the box. I mean using OLM outside the source. That has been tested.
MR. GROSSMAN: So your stage three results should show higher concentrations of NO2 than your stage two



results, because it's more conservative?
THE WITNESS: Generally stage three is taking your lower maximums. It is somewhat lower.
MS. ROSENFELD: Stage three is less conservative, correct?
THE WITNESS: Correct.
MR. GROSSMAN: Well, then I misunderstood. I don't, I thought you just said that stage three, where you're using that 50 percent assumption --
THE WITNESS: There's another factor --
MR. GROSSMAN: -- was more conservative than the OLM method, but stage two used the OLM method. So where you're more conservative, you would show a higher conversion to NO2, would you not?
THE WITNESS: Your logic is correct.
MR. GROSSMAN: But my answer is wrong.
THE WITNESS: No, no, your answer is correct for the information at hand, but there's another difference between stage two and stage three. Stage two is all based on old NO2 data, old, very old background data, 2006 to 2010, to match the meteorological data set we use throughout this project before. So you're having very high background that's kind of balancing that, to some extent. So that's what you were seeing. The fact that the background is so much lower does result in stage three having lower overall

impacts.
So we couldn't run every gradation here, Mr. Grossman, because we would have had so many runs it would have been unwieldy. But we did show a stage two and stage three, as I just explained this, to show a range. And we also did a test, as I'd be happy to talk about, where we applied OLM to all receptors outside the source region. You know, if the tailpipe box is done by OLM, we have tested that.
MR. GROSSMAN: Well, okay, but so if I understand you correctly, what you're saying is that in stage three you used a conversion ratio that was more conservative than the OLM method would have shown, but you had a different variable. You used a corrected background. Well, you didn't say corrected --
THE WITNESS: More recent.
MR. GROSSMAN: A more recent background level of NO2?
THE WITNESS: Correct.
MR. GROSSMAN: So and therefore the bottom line result was a lower level of NO2 in stage three. Do I understand you correctly now?
THE WITNESS: You're correct.
MR. GROSSMAN: Okay.
BY MS. ROSENFELD:



Q Now I'm confused. In stage two when you have the 100 percent conversion under the OLM, you assume that all available ozone is used to convert to NO2, is that correct?
A You said 100 percent conversion. There's no 100 percent conversion on here.
Q Not 100, but that 100 percent of the ozone that's available actually is used to convert to NO2, correct?
A That's what AERMOD will do, yes.
Q And in stage three you're assuming that only 50 percent of the available ozone actually is used to convert.
A No, we're assuming that there's always enough ozone, and we're assuming there's enough time, which there isn't, to convert from 25 percent to 50 percent in a very short distance. Based on the references I've shown, that really is way too short.
But to come up with a conservative bounding approach, we said let's do 50. We know it's an overstatement. It's probably more like 25 percent. But we'll show it conservatively that way, and we did, so we'd have two different ways we showed it, stage two and stage three.
MR. GROSSMAN: In other words the 50 percent does not refer to the amount of ozone available. It refers to the assumed conversion percentage of NO to NO2, is that correct?



THE WITNESS: That is correct.
MR. GROSSMAN: Okay.
MS. ROSENFELD: So it assumes that 50 percent of the NO gets converted.
THE WITNESS: It assumes 50 percent of the NO will convert.
MS. ROSENFELD: Got it. And is that, that's 50 percent of the 75 percent that was remaining, right?
THE WITNESS: I want to clarify. It's 50 percent of NOX.
MS. CORDRY: Original?
THE WITNESS: Original, correct. Fifty percent, if the NOX was 100, if you had assumed it all NO2, it would be 50.
BY MS. ROSENFELD:
Q Okay, so of those original 100 units that I talked about, you're assuming that 50 percent of those original 100 units get converted.
A Correct.
Q So in that case you would have, so does that leave you with a 75 percent conversion ratio, the 25 percent plus the 50?
A No, for stage three we're assuming for every situation except the gas queue and loading dock inside the box, we're assuming that half of the NOX is NO2, throughout



the grid, no matter how close it to the source. It's always at 50 percent NO2.
Q Got it. So ozone doesn't factor into it at all.
A No. This is beyond available, most ozone levels when we have peaks, which happen in the winter at nighttime, the average is around 10 ppb of ozone, like 20 micrograms. You've not going to convert very much with 20 micrograms, up to 20.
Q And so that's why you said earlier that stage three is not the ozone limiting method.
A Correct.
MR. GROSSMAN: But you said ozone doesn't factor into it at all. I think what was testified is ozone does factor into it, but you've made assumptions that there's enough available ozone to make that conversion of 50 percent of the NOX to NO2, correct?
THE WITNESS: Correct.
BY MS. ROSENFELD:
Q And under stage two, what is the highest percentage of conversion that you found?
A I don't recall. The model doesn't print that out. It may be possible to write statements in it to do that, but the model output shows your concentration of NO2, not conversion ratios. That's all internal calculations.
Q So it could be higher than 50 percent. You just

don't know.
A During the, based upon our analysis and review of when the maximum conditions occurred for creating NO2, they occurred during time periods that had low ozone. Again, that was typically in the early evening hours when the rush hour peak occurred, and mostly during, almost all during the hours of November, December, and January, when ozone is at its minimums.
Q In terms of the time and distance that you discussed for the conversion, assuming that there is NO and ozone, that there are those two molecules in proximity, the actual conversion process itself doesn't take very long, right? The time is a factor of making sure they're in proximity to each other.
A More than in proximity to each other. They have to be, I'm going to read the quote that's, helpful to read the quote that's in appendix B, how much molecular, we're talking about molecular contacts, which is more than just getting close proximity. This is the inherent assumption that is the basis for the ozone main method.
MR. GROSSMAN: What page are you on, sir?
THE WITNESS: On page 27, the PDF that I attached in the middle of the page.
MR. GROSSMAN: I see it.
THE WITNESS: It assumes that complete mixing of



plume NO and ambient ozone down to the level of molecular contact has occurred by the time the plume reaches a ground level receptor of maximum NOX concentration. Or for a typical power plant, again that's probably two or three or more kilometers of travel prior to that occurring, much more travel time than we're talking about here, especially distance-wise.
BY MS. ROSENFELD:
Q What paragraph are you in?
A I'm at the third paragraph, which is an obviously font.
Q With the big text, okay.
A The dark bolded one.
MS. CORDRY: It was too hard to see because it's too big.
THE WITNESS: It's clear on my copy.
MS. ROSENFELD: It's clear on mine as well.
MS. CORDRY: It's big, so you know, your eyes go right over it.
THE WITNESS: It's big. It stands out.
MS. CORDRY: Yes.
THE WITNESS: It stands out. If you don't have molecular, the fusion of molecular contact, you don't have ozone converting. If there is contact at the molecular level, if you go in a smog chamber and you introduce NO and



NO2 and you have a fan that stirs it up, then you, it's tens of seconds, I agree with Dr. Cole on that point, inside the chamber, but not inside the atmosphere.
MS. ROSENFELD: No.
MR. GROSSMAN: It's tens of seconds, or tenths of seconds?
THE WITNESS: I looked at some reports on that, and if you had a 10 part per billion level, the study I reviewed showed it would take about 40 seconds to convert --
MR. GROSSMAN: Forty, four-zero?
THE WITNESS: -- which is 10, 40 seconds.
MR. GROSSMAN: Okay.
THE WITNESS: But one meter per second, by coincidence, is about 40 meters, is 40 meters. If you had complete contact. But it takes a long time for molecular diffusion in the atmosphere to create intimate contact at the molecular level. It's a long process.
MR. GROSSMAN: Because if I recall Dr. Cole's testimony on that point, he said that the conversion upon contact was almost instantaneous. That's my recollection. So you're saying it's actually not instantaneous.
THE WITNESS: There's a subtle difference. In a smog chamber it is, it's quick, but not instantaneous. But in the atmosphere, and the literature really is clear on this point, it takes a long time.



MR. GROSSMAN: I understand. Okay.
BY MS. ROSENFELD:
Q All right. First going to stage two, and I'm still working my way through the process of how you came up with your analysis. You have to make a selection as to which monitor or monitors you will use for the concentrations of the pollutants you're looking at, correct?
A Well, which pollutants are you referring to?
MR. GROSSMAN: You mean monitors or receptors?
MS. ROSENFELD: The EPA monitors.
MR. GROSSMAN: Okay, so for background.
MS. ROSENFELD: Right now I'm moving on from receptors.
MR. GROSSMAN: Okay, so you're asking --
MS. ROSENFELD: Just for the moment. The background monitors.
MR. GROSSMAN: Okay.
MS. ROSENFELD: Right.
THE WITNESS: You need to select a background monitor for ozone and NO2.
BY MS. ROSENFELD:
Q And then you also have to choose which time period you evaluate, correct?
A Well, you pick the set of years you're going to evaluate. We did 2006 to 2010, and 2010 to 2012.

Q Stage two was 2010 to 2012?
A Stage three was based upon 2010 to 2012.
Q And did you also have to select which hour or day or season data you're using?
A During the whole year? All the, every day for the, within those time periods. Every hour, every day.
Q And you did that in stage two and stage three both, correct?
A We do that, and for stage two it involves ozone and NO2. For stage three it's ozone. I mean it's NO2. That's hour by hour.
Q And particularly with respect to the stage two with the ozone limiting method, the level of either chemical, whether it's ozone or NO2, on any given day and any given hour would depend on factors such as the wind direction and the wind speed with respect to that particular monitor, correct?
A Yes, it would.
Q And in this case you obtained your ozone levels from a monitor in Rockville for part of the year and from Beltsville for part of the year, is that correct?
A You're referring to ozone?
Q Yes.
MR. GROSSMAN: When you say in this case, you're talking about which stage?



MS. ROSENFELD: It would be stage two --
MR. GROSSMAN: Okay.
MS. ROSENFELD: -- because they only evaluated that in stage two.
THE WITNESS: We used Rockville and, Rockville and Beltsville is correct.
BY MS. ROSENFELD:
Q And did you have to use Beltsville because Rockville doesn't measure ozone for the full year?
A When it was missing, my recollection is when it was missing records we filled it with Beltsville.
Q Does Rockville monitor for the entire year?
A Well, the objective, my recollection is they do. The objective is to monitor for the entire year, but sometimes monitors don't work right. Sometimes they malfunction or are missing data for whatever reason.
Q And you monitored for ozone from 2006 to 2010. Was the monitor in Rockville missing data in all five of those years?
A I don't have the full data set in front of me. I wouldn't be surprised if it was missing some hours in each year.
Q So did you only need to fill in for occasional hours or occasional days, or was it for long periods of time?



A My recollection is occasional, but I haven't, I would have to look at the data sets to tell you exactly how much fill there was. I don't remember.
Q And you're matching the ozone levels that you derived from the monitors in Rockville and Beltsville with NO2 levels from a monitor in Arlington, is that correct?
A You said derived.
Q You're matching?
A Well, I inputted the data from, for ozone, as we just described. And I inputted the NO2 data from Arlington. I didn't modify it.
Q But you're, so the data that you got for ozone you obtained from a monitor in Arlington, correct?
A No, it was NO2 --
Q I'm sorry, NO2.
A -- that was from Arlington. That's correct.
Q And do you agree that the Arlington monitor is about 15 miles or so south of the mall?
A I don't have the distance exactly, but that's, it's, you know, that much or more. I don't disagree.
Q And the Rockville monitor is several miles to the northwest of the mall?
A That's correct.
Q And Beltsville is primarily east and a little south of the mall.



A That's, well, it's, there, Rockville and Beltsville are probably equal distance from Wheaton Mall. Beltsville to the east, I don't know the exact distance, but your number seems reasonable.
Q I just said several miles. Do you have a better estimate than that?
A No, I don't.
Q If you could turn back to the CAPCOA guidance document, if you could look at appendix A on page 33.
MR. GROSSMAN: I'm sorry, what page?
MS. ROSENFELD: Thirty-three, appendix A. I'm sorry, did we mark this as an exhibit?
MR. GROSSMAN: We did. It's Exhibit 567.
MS. ROSENFELD: Right. The first new one.
MR. GROSSMAN: Correct.
BY MS. ROSENFELD:
Q In section 4.2 there's a description of the modeling options available within each tier, tier one, two, and three, is that correct?
A Correct. Table one modeling options is correct.
Q Right. And it says within each of the three tiers described above, there are 11 options that may be applied to assess a project's compliance with the NAAQS. Each progressive option will require more information and/or resources. That's right under the section 4.2 heading,

correct?
A Correct.
Q And table one under that section 4.2 lays out 11 different modeling options, correct?
A Yes. Well, significant impact level analysis, yeah, one through, there are 11 sets.
Q And number 11 is described as the paired sum five-year average of the 98th percentile, correct?
A That's what it says.
Q And is that the approach that you took in your stage two analysis?
A Our approach is consistent with the Fox 2011 e-mail. We did have five years of analysis, and we did a paired sum in stage two. So I'd say it's certainly somewhat of, maybe exactly the same thing.
Q And it's clear, option 11 has the double asterisk, if you look down below it says option 11 may be used with the approval of the reviewing agency, is that correct?
A Correct.
Q And is that required for any of the other 11 options? Any of the remaining 10 options?
A CAPCOA only shows that for the 11.
Q Is your tier, is your stage one analysis, does your stage one analysis fall within any of those 11 options?
A We used the maximum background, 98th percentile



background value for all receptors, in conjunction with the directly modeled data.
Q And that correlates with what number?
A I have it best correlated with number six.
Q Okay. And where does stage three fall on that table?
A Stage three? Where does stage three fall on that table? Well, it's paired some 98th percentile. It's a three-year average, not a five-year average. We used the most recent three years.
Q And generally speaking, is a three-year average less conservative than a five-year average?
A Well, if you're going back in time five years with a trend like we had for NO2, yes. And if you went back five years, if you for example used 2006 to 2010, the concentrations back in 2006 for NO2 were much higher than they are today. So you would have a more conservative, a less representative background level.
Q You could have, could you have used a five-year analysis, 2008 to 2013 five-year analysis?
A 2013, the full, when we did this modeling the full year hour by hour data were not available. That's why we capped it at 2012. So the answer to your question is no, we couldn't have done that.
Q Oh, so but you could have used 2008 to 2012.



A We could have mathematically put that into the model, but my point is in my judgment, looking at the trend line we have here, it would be inappropriate to go back beyond the most recent three years, because it was a very strong trend line dropping NO2 levels, background levels substantially.
Q And if you had used the 2008 to 2012, would that have been a more conservative analysis than using the three years?
A You'd probably get higher and less representative estimates.
Q And the 50 percent cap that you placed in the stage three, is that reflected in any of those 11 options?
A This particular set of 11 options is generic guidance. As I mentioned previously, we're modeling inside a gas queue, inside a loading dock, and it's a very atypical application which would not be contained in this or any EPA guidance document. Usually the guidance is general guidance, and things like this are done on a site specific basis.
Q Is the analysis in your rebuttal report under tier two and, stage two and stage three, less conservative than the analysis contained in your November 2012 report?
A Is it less conservative than November 2012? Well that, if we were to correct for the background issue --



Q Yes.
A Yes, it's more, it is more realistic.
Q And is the analysis in your rebuttal report less conservative than the analysis contained in your August 16, 2013 report?
A Yes, it is. That report was based on 100 percent conversion.
MS. ROSENFELD: Mr. Grossman, for the record I just want to reiterate that we continue to oppose consideration of the stage two and stage three analysis of Mr. Sullivan's rebuttal report. And these methodologies can only be, in addition to the fact that they should only be reviewed on a case by case basis by the appropriate governmental authority, if the applicant can't rely on the standard methods and defaults prescribed by EPA guidance, which Mr. Sullivan has conceded he has not done, those standard methods and defaults reflect generally accepted scientific methodologies. And as a result the rebuttal report does not satisfy the fundamental requirements for admissibility under Maryland law.
And it's clear under Maryland law that courts and non-expert administrative agencies are not supposed to be the arbiters of developing or novel scientific approaches, whether or not that science is good, bad, or unfounded. And that the administrative agencies are supposed to make

decisions based on judgments that are well within the mainstream of accepted scientific analysis. And the discretion that's been conferred upon the EPA to allow for these non-preferred and non-default methodologies rests within their expertise.

And again I just would like to reiterate that we ask that those two methodologies be stricken from the record, and we ask that evidence and testimony be excluded, and that we concluded with our cross-examination on his report at this point, should you see fit to rule in our favor.

MR. GROSSMAN: All right. Well, first of all, as I think I said earlier, I want to hear also from Dr. Cole on these points before I rule on that area. That is, the scientific acceptability of the methodology used by Mr. Sullivan in order to respond to your evidentiary point. So I'm not going to ask for a response now from the applicant, I mean until I hear from Dr. Cole in surrebuttal.

MS. ROSENFELD: Sure. I was just making the record.

MR. GROSSMAN: No, I understand, but I think it's a little premature because I said I would, if you renewed that objection I would act on it.

MS. ROSENFELD: Mm-hmm.

MR. GROSSMAN: But I do want to hear from Dr. Cole



on the point, because we might as well consider all the expert evidence on the point before we make a ruling.

MS. ROSENFELD: Thank you.

BY MS. ROSENFELD:

Q Mr. Sullivan, in light of the findings set out in your rebuttal report, in your opinion will there be adverse health effects on the residents, workers, and visitors within the mall parcel as a result of the pollution concentrations that you show under your stage one analysis?

MR. GOECKE: Objection. Beyond the scope of his testimony. If I heard her correctly, she's asking for health effects.

MR. GROSSMAN: I think so. I think that, aren't you in fact asking something beyond, certainly beyond what was covered in the rebuttal direct. He did touch on health effects in his original direct. And so and I think it might have been objected to at that point, but he was using statistical, as I recall, it's been a long time, but projections regarding some health effects in his original testimony. But I don't recall it coming up in the rebuttal testimony, so.

MS. ROSENFELD: As I recall under his, under Mr. Sullivan's stage one analysis, there was some discussion about whether or not exposures would be limited to 20 minutes, and if that's --



MR. GROSSMAN: Well, that was, but I don't think that was directed, the question didn't come to health effects per se, it came to analysis of how many minutes the person was exposed, and whether you should apply the one-hour standards, or a third of the one-hour standards if there was 20 minutes in the queue. So it didn't directly, he didn't directly opine on health effects.

BY MS. ROSENFELD:

Q Okay. Let me ask the question a little bit differently. Mr. Sullivan, you have no opinion, you've expressed no opinion in your rebuttal report as to potential adverse health effects on the residents, workers, and visitors within the mall parcel, as a result of the pollution concentrations that you show in your stage one analysis?

A I'm just going to, I'm preparing the modeling, I mean I show the modeling, in each one I show what the national standard is. I'm not qualified to go beyond the national standard. But point of comparison can be made.

But I do want to clarify that the stage one figure shown here assumes 100 percent time in queue. It's in the whole hour. We're not doing that factoring. The factoring is respective, I mentioned that point, that they cannot be there for the full hour. But that figure doesn't take that into account.



Q Okay. And in your rebuttal report you expressed no opinion as to whether there will be adverse health effects on the residents, workers, and visitors within the mall parcel as a result of the pollution concentration levels that you show on your stage two analysis, is that correct?

A Well, not directly, but again, I show what the standard, and I show the stage one, two, and three, what the model maximums are. And in each case the model maximum, based upon conservative modeling, is less than the standard. So based upon what I can opine about, if it's less than the standard, according to EPA, there should not be health effects to the worker, people visiting, or anyone else.

Q Well, I certainly don't think that the opposition concedes that point, so I guess my question is are you opining on health or are you not? Because there's been testimony in this case that not only do EPA standards presume protective measures lower than the maximum that's for nearby areas, but there's also been testimony that in fact there are potential adverse health effects at those lower levels. So I guess I'm trying to establish whether or not you're expressing an opinion on health in your rebuttal report with respect to your stage one analysis, your stage two analysis, and your stage three analysis. What is the scope of your report with respect to --

MR. GOECKE: I would object to that. He's already answered the question.
MS. ROSENFELD: I don't think he has.
MR. GROSSMAN: Yeah, I'm going to, but see I'm going to overrule that objection, because if he wants to clarify it, I'm going to give him the opportunity to clarify that. So go ahead, answer.
THE WITNESS: I made a statement, based on my professional judgment, considering the substantial duties of conservatism in the modeling, and also considering measured data that's available throughout the country, that I, my opinion is that the maximum 98th percentile value on this, in this parcel, will be in the range of 75 to 100 micrograms per cubic meter, less than half of EPA's standard.
MR. GROSSMAN: For?
THE WITNESS: For one-hour NO2. Thank you. So on that basis, and following EPA's lead that sets the standards for the country, my conclusion is that there will not be adverse health effects. I'm speaking as a meteorologist interpreting EPA's standards. I'm not a toxicologist. I'm not a medical doctor.
BY MS. ROSENFELD:
Q And did I hear you say that it was your conclusion that the results are less than half of the EPA max?
A That's correct. For NO2.



Q For NO2. At stage one again, your maximum was what number?
A The statement I just made to clarify --
Q Figure one.
A -- was based upon stages, looking at stage three, which in my judgment is the most accurate circumstance conservatism. If you're looking at stage one, you're showing a maximum of one, approximately 160. And --
Q And is that more or less than half?
A Well, I --
MR. GROSSMAN: Well, we don't have to go over that.
MS. ROSENFELD: All right.
MR. GROSSMAN: I mean it says what it says, and I think he's made very clear what his position is.
BY MS. ROSENFELD:
Q If we could look at figure three, please, on page 13 of your rebuttal report. And what is the maximum number that you derived?
A The maximum model here is 121.
Q And is that more or less than half of the max?
A Well, clearly that's a little bit more than half, but my point, I'm making the point, as I mentioned before, based upon consideration of the degree of conservatism, and based upon the fact that monitors throughout the country are



showing concentration in high impact areas that are, you know, on the order of, for example in California in 2013, there's 103 monitors. The highest one in the entire state of California of those 103 was 77 parts per billion, which is 145 micrograms. And we think --
Q And where are you reading that from?
A -- that at this location it's going to be 145 micrograms, even close to that? No.
Q And where are you reading that number? What was that number again?
A This, you can obtain this by going to EPA's air data and put in NO2 one hour. The year is 2013. And look at all sites listed for 2013 at this point in time. There's 103 of them, and 145 micrograms per cubic meter is the highest of those sites, maybe the highest in the country.
Q And was, is this information contained in your report?
A It is not. But it's publicly available information that can be confirmed very easily.
Q And was this number derived, the 145 micrograms, was that drawn from a near road monitor, an EPA near road monitor?
A I looked at it this morning, 103 sites. Some of them could very well be. I don't know the answer to that question. But this site is not a near road monitor site.



We're talking about the Wheaton Mall ring road. They're monitoring sites for major highways like I-710 in Port of Long Beach.
Q And the EPA recently required near road monitors in fact, is that correct?
A EPA is requiring the states to have some near road monitors starting in 2013. 2014, I'm sorry. January 2014. They're running a little bit late in some cases, but they're coming on line now.
Q And in fact that's because the EPA thinks that perhaps emission levels have been underreported, isn't that correct?
A From what I've seen so far, that doesn't look like that's the case.
Q Is that why --
A I don't know why EPA, I assume EPA wants to know what the near road concentrations are. I'm not going to presume that there's going to be a problem, because the initial data doesn't suggest that at all.
Q Well, you just said you don't know why they're doing it, so --
A I said I'm not going to presume that they're doing it because they're concerned there's a problem. The initial data to date suggests there's not a problem. Not relative to the standard of 190 micrograms per cubic meter, not from

the data I have seen.
Q And to your knowledge has the EPA required that monitors be located in remote rural non road locations?
A Well, they've had them in those locations for years. That's not a new requirement.
Q They're not at, supplementing those current monitors, are they?
A They're adding some additional monitors near major highways to assess near road exposures, usually within, you know, 10 meters to 40 meters of a busy road such as I-710, that has probably 100 times more emissions in one kilometer than this gas station operation would ever have.
Q In your rebuttal report you used MOBILE6 as the modeling framework for the rebuttal report, correct?
A Yes.
Q And I think you testified that you used a software code called FORTRAN to, quote, add the hour by hour data, end quote, for the receptors within the 40 meter radius of the gas queue?
A We did use FORTRAN programming to combine runs, but that is not really related to MOBILE6.
Q You use that to add the specific data for your analysis, correct? In, on your report, page 32 and 33, you said you used FORTRAN to, quote, add the hour by hour data, end quote.



MR. GROSSMAN: Why does that matter?
MS. ROSENFELD: Well, I'll get there in just a moment.
THE WITNESS: We used FORTRAN programming in stage two inside the tailpipe box because it was summing two runs. That required us to have model output on an hour by hour basis for all the receptors, store those matrices, and then use FORTRAN programming to process the data and to come up with the 98th percentile values.
BY MS. ROSENFELD:
Q And did you also use that in your stage three analysis, FORTRAN?
A FORTRAN programming was not required for stage three.
Q In your --
MR. GROSSMAN: Has FORTRAN been modified in the 50 years since I studied it in college?
THE WITNESS: It's been a long time since it's been modified. It was modified a few times, but no, I don't believe that, it's been quite a while. The models were all written in FORTRAN.
BY MS. ROSENFELD:
Q In your report you reference a document called Introduction to MOVES for Non-Modelers, an EPA publication dated August 12th, 2012. Do you recall that document?



A I don't recall the document.
Q It's on page 17. Actually it's listed --
A Did you say page 17?
Q It's in your list of references, actually, and it's called, let me see if I -- oh, it's the second to last reference.
MS. ROSENFELD: And Mr. Grossman, what I'll do is I'm going to hand out an excerpt. This doesn't have to be marked as an exhibit. This is simply an excerpt from Exhibit No. 466. It's the --
THE WITNESS: The reference.
MS. ROSENFELD: -- references from Mr. Sullivan's report. And for simplicity I've numbered them. That's the only change to this document.
BY MS. ROSENFELD:
Q If you look at number 15, it says United States EPA, MOVES Training for Non-Modelers, northeastern transportation, released on August 2012. It says PowerPoint, refer to page 17. Do you have that document with you?
A I don't recall actually relying upon this document.
Q No?
A I just don't recall it.
Q It is cited as a reference.



A True. I just don't recall relying upon it.
Q Do you have a copy with you?
A I don't.
MS. ROSENFELD: Mr. Grossman, I apologize. I don't have an extra copy. What I'd like to do is show this to the witness, and then we can have it introduced as an exhibit, or should I have it marked first?
MR. GROSSMAN: What are we talking about? What is the --
MS. ROSENFELD: It's exhibit, it's reference number 15.
MR. GROSSMAN: Okay, so you're talking about this United States EPA MOVES Training for Non-Modelers?
MS. ROSENFELD: Yes.
MR. GROSSMAN: Page 17 or --
MS. ROSENFELD: Page 17.
MR. GROSSMAN: Okay. Well, let me take a quick look at it and see what you're talking about. So you only want page 17 in, is that the idea?
MS. ROSENFELD: No, I've got other questions.
MR. GROSSMAN: Okay. Well, I can mark it, mark the whole document, since we don't have enough paper in the file already. All right, this will be Exhibit 568, 568. And that's EPA Introduction to MOVES for Non-Modelers.
(Hearing Exhibit No. 568 was

marked for identification.)
BY MS. ROSENFELD:
Q Mr. Sullivan, if I show you page 17 of what's been marked as Exhibit No. 568, if you'd take a look at that, do you remember seeing that?
A I don't specifically recall seeing this, no. Again, I don't believe I relied upon this reference.
Q Okay.
A I don't remember using it.
Q So you don't have any reason why --
A I don't remember why it's on my list.
Q -- it's in your list.
A I don't.
Q Okay. All right. If I go to page 5 of that same document, Exhibit 586, page 5 has a caption that says why did EPA develop MOVES, and there's three bullets. Would you read the second bullet into the record, please?
A FORTRAN code used in MOBILE6.2 is obsolete and difficult to maintain. More modern data base design needed.
Q Okay. And is there a reason why you didn't use more modern as in MOVES?
A Just an aside, EPA uses FORTRAN for AERMOD modeling, and all the predecessor modelings that I've ever seen. FORTRAN is a tool. It allows you to program different things. They're not saying that FORTRAN gives you



the wrong answer. They're saying there's new data bases that can be relied upon, but for modeling EPA continues to rely upon FORTRAN. And we've been using it for 40 years, mostly dentists. I used to use it. And so we continue to do so. There's nothing wrong with FORTRAN.
MR. GROSSMAN: Okay.
MS. CORDRY: Marking off questions.
MR. GROSSMAN: I'm sorry?
MS. CORDRY: Marking off questions.
MR. GROSSMAN: Hopefully we're near the end. If you're finished with that exhibit, return it to me, because it's now an exhibit.
MS. ROSENFELD: Actually I am through with it for now. I will have other questions on it for our rebuttal witnesses, surrebuttal.
MR. GROSSMAN: Okay.
MS. ROSENFELD: Mr. Grossman, I don't have a clip. Is it okay if it's loose?
MR. GROSSMAN: All right. Well, we'll supply a clip. Your other thing's loose, too.
MS. ROSENFELD: I'll turn it in when we take a break.
MR. GROSSMAN: Okay.
MS. ROSENFELD: Okay.
BY MS. ROSENFELD:



Q If you would turn to page 3 of your rebuttal report, on page 3, in the middle section, as I read it you conclude that all of the mall areas are urban, which I think is consistent with your earlier testimony, is that correct?
A You're referring to the statement that says Dr. Cole conceded that all areas within the mall parcel can be characterized as urban?
Q I'm reading lower down, where it says this rebuttal report shows that the air parcel traveling from the south toward the ring road would be 100 percent urban, adjusted to mall land use by the time it reaches the queue.
A That's what it says.
Q Okay. And then finishing that sentence, you say which would also apply to all trajectories. Can you explain what that means?
A Well, a trajectory from the north, for example, the air would have to travel throughout the entire mall area, or from the east or west. The closest trajectory for the neighborhood is from the south.
Q So here you're referencing the air that's traveling across the mall parcel, and regardless of which direction, once it gets to the queue area it's all urban.
A Correct.
Q Okay. In your rebuttal report you say that Dr.



Cole was in error when he stated that the gas queue would be located in a transition zone between rural and urban conditions. And when Dr. Cole concluded that the most appropriate dispersion rate would be intermediary between urban and rural, correct?
A Yes.
Q You disagree with his conclusion?
A I didn't agree with, I believe he's in error. I stated he's in error.
Q On page 26 of your November 2012 report though, did you not say that the most accurate characterization of nearby sources would be expected to be between the urban and rural results?
A Well, if you look at it in context, I was referring to the fact that we modeled urban and rural, like the closest homes and school and pool and so forth. And my statement didn't apply to the mall. It pertained to the area off the mall, where those properties were. And I never assigned 50-50, first of all. And I just said that at those locations it would be midway between. I didn't assign a number.
Q If you could turn to appendix C of your report.
MR. GROSSMAN: What page is that on?
THE WITNESS: Page 35.
MR. GROSSMAN: Okay.

BY MS. ROSENFELD:
Q Distance for adjusted to new surface conditions at the mall area, on that page 35 you cite to a formula from a study reference by Panofsky and Dutton. It's part of your conclusion that wind will achieve equilibrium with the new surface, correct?
A That's a textbook authorized by Hans Panofsky and John Dutton, 1984.
Q And you state that you use the Panofsky and Dutton formula to determine the distance required for wind to achieve equilibrium? Is that -- go ahead.
A That's correct. As I testified earlier, I used that reference as an example. There are many others that could be used as well with similar conclusions.
Q And did you include the Panofsky and Dutton reference in your list of references?
A I think it was inadvertently left out, but I believe it was in an earlier reference list, but I certainly relied upon it before.
MR. GROSSMAN: Well, he does list it in appendix C.
MS. ROSENFELD: Excuse me?
MR. GROSSMAN: You said did he list it. It is --
THE WITNESS: Oh, it is correct.
MR. GROSSMAN: -- referenced in --



MS. ROSENFELD: In his reference list.
MR. GROSSMAN: No, it's not in the reference list, but it's actually on page 35 of his report.
THE WITNESS: Yeah, I mentioned the name, but I haven't provided the full reference. I mean it certainly is a, it's an available textbook basically is what it is.
BY MS. ROSENFELD:
Q Did I understand correctly from Ms. Harris that you got pages 150 to 153 of the Panofsky and Dutton article from the Library of Congress?
A I have the whole text.
Q You have the whole text?
A Yes.
Q Can you explain why the whole text was not provided after I requested it?
A I think we provided the pages that you asked for, the methodology. It's a several hundred page book. It's available through the library. I mean I didn't copy the whole book.
MS. ROSENFELD: Well, not having the whole text, I do have what was provided. Mr. Grossman, if we could have this marked as an exhibit, please.
MR. GROSSMAN: All right.
MS. ROSENFELD: These are the four pages from the Panofsky and Dutton analysis that were provided.



MR. GROSSMAN: Okay, this will be Exhibit 569. And it's pages 150 through 153 of Panofsky and Dutton, 1984 text, textbook. And what's it entitled, Mr. Sullivan, the textbook?
(Hearing Exhibit No. 569 was marked for identification.)
THE WITNESS: Atmospheric Turbulence. The sub-heading under there, I don't recall the exact wording of it, but Atmospheric Turbulence.
MR. GROSSMAN: All right, Atmospheric. I take it it never made it to the best seller list.
THE WITNESS: It's hard to get now, but it's at the Library of Congress.
MR. GROSSMAN: All right.
THE WITNESS: That was my advisor at Penn State. Hans Panofsky wrote the book.
MR. GROSSMAN: Okay.
BY MS. ROSENFELD:
Q All right, so on page 35 of your rebuttal report you say that you derived the formula shown on page 35 from this Panofsky and Dutton paper. And you say it came from page 50, 150. When I look at page 150 I actually see two formulas on that page. Can you tell me which one you're referencing on page 35 of your report?
A Referencing a formula that I believe is formula



two.
Q Under number two?
A Correct.
Q And does number two include within it the formula under, in parentheses one?
A Does formula two include within it reference one? It was derived from equation one.
Q It was derived from. And equation one, if I read just above that it says Miaki (phonetic sp.), quote, Unpublished M.S. thesis, University of Washington, Seattle, end quote, argued that the vertical signal velocity in neutral air should be proportional to the friction velocity, thus, and then you go into, and then they cite the formula under subparagraph one. Are you aware as to whether or not this formula from this unpublished thesis has been recognized by the EPA?
A Well, this formula, formula number one, was evaluated by Dr. Panofsky and Dr. Dutton. That's how they arrived at equation number two. This had nothing to do with EPA. I don't know if EPA has a position on the slope of an adjustment, that interface, or not. But this was not an EPA, this is a textbook, not an EPA-related document.
Q And looking at page 151, just under the number four on the right-hand side, there's a sentence that, there's a paragraph that starts that says most theories

avoid the simple assumption one.
A Where are you finding that?
MR. GROSSMAN: That's in the middle of page 151. It's like the third paragraph down, right under in general however, it says most theories avoid.
THE WITNESS: Okay, I'm with you.
BY MS. ROSENFELD:
Q In your formula on the bottom of page 35 of your report, did your incorporate or did you avoid the assumption under paragraph one on page 150?
A We certainly didn't go into applying the equation of motion and the equation of continuity to derive our own equation. We used equation two with reordering of the, you know, combining terms, which we're showing in our equation here, to estimate the front, the height, how many feet per, of height rise per feet of distance crossed.
MR. GROSSMAN: Just so you can, I don't do suspense well, so is Dr. Cole going to dispute the application of this theorem?
MR. COLE: Oh, yeah.
MR. GROSSMAN: Okay.
MS. ROSENFELD: For the record, yes.
BY MS. ROSENFELD:
Q The Panofsky and Dutton article was published I think you said in 1984. Have there been any advances in the



methodology shown on page 150 since then?
A I looked at other formulas on line and I did, there are others that I found were consistent with the slope factors that Panofsky showed. So yes, there are others. I don't have the full references with me, but there clearly were.
Q Do you know if the methodology used in the Panofsky and Dutton article has been extensively used or cited by others?
A I don't know how often it's been cited by others, but I can say that it was consistent with the other reports that I reviewed.
Q When I look at page 35 of the report, is this the same formula that is shown on page 150 of the Panofsky report?
A My recollection is it's terms that have been combined, but it's a consistent formula. Terms of been rearranged.
Q Would you walk me through, please, the changes?
A I'm not going to derive the calculation on the stand. We took the terms and combined terms and solved for X. I'd prefer not to do calculations on the stand. We re-evaluate how we come up with that formulation from equation number two. It was a matter of combining terms and solving for the X term.



Q Well, I'm not asking you to do a calculation, but I am asking you to explain to me how the factors and the ratios that are shown in two correlate with the ones that are shown on page 35 of your report.
A Well, for example there's terms that are in this equation, too. KA is approximately a value of .4 or .39 is what that constant would be. And the B as a factor is 1.3. Surface roughness is an input, a Z zero, which we solve for. And those terms have been rearranged solving for X. That's what we did. H being the height of the interface above ground level.
Q All right. Could we start at the left on the Panofsky report, and could you explain to me what those terms mean?
A H, you're referring to equation two?
Q Yes, I am.
A H is the height of the interface. Z zero is surface roughness, length. KA is a constant, usually held between .39 or .4 as a simplification. B is a constant which is set to 1.3, an empirical constant. And X is the downwind distance of the --
Q X is distance?
A -- from the interface.
MR. GROSSMAN: What does L sub N refer to, or LN? Within the bracket.



THE WITNESS: Log, natural logarithm.
MR. GROSSMAN: Okay.
BY MS. ROSENFELD:
Q So going back to my question, is the formula that you show on 35 the same formula that's shown on the Panofsky article?
A My answer was it's the same formula but rearranged terms.
Q And what do you mean, rearranged terms?
A We're solving for X, we're solving for X.
Q Right.
A You have a KA multiplied times a B. Those are both constants, so they've been combined. That's what I recall we did in rearranging the terms and solving for the X distance. X basically is telling you how far you have to go across the new surface to have the conditions adjusted at a particular height.
UNIDENTIFIED SPEAKER: H varies with distance.
BY MS. ROSENFELD:
Q Does H vary with distance, or is it a constant?
A H varies with distance.
Q H is the height of the interface. So if H is the height of the interface, tell me how that relates to what you're modeling here.
A The sources of the gas queue, for example, which

is a dominant source of interest, and the breathing height, is five feet, approximately five feet, 1.5 meters. And actually for the gas queue, that source model, that's .75 meters, which is about two and a half to three feet above ground level.

For our sources the height of interest is very low, because the growth of the front of adjusted air is a function of distance, to get to a height of two to three feet or take it up to five feet, the upper bound, it doesn't take very long. It adjusts very quickly, as shown by this formula and others you can review in the literature.

Q So in your formula on page 35, there's an H in the middle of the formula. Is that, what height does that represent?

A Well, if you put your height in, the H and X are the two variables, so and you set the surface roughness term. If you put in H of 1.5 meters, you solve for how many meters for X would match that value, or vice versa.

Q And does this take into account the fact that there's a slope from the area of the homes up to the queue?

A That's not the issue here. We're talking about air that has moved up the hill and is going across the parking lot. Sure, there's a slight slope there as well. But it's not getting into that level of detail. It's an approximate formula that's showing how fast it'll adjust to



a new surface. But clearly the slope of the parking lot is not an input.

Q And does it take into account the fact that there's going to be an eight-foot wall at the top of that slope?

A All that would do is make it transfer sooner, in my judgment.

MR. SILVERMAN: Transfer what sooner?

THE WITNESS: It's going to adjust, the turbulence is going to flow across, to have more mixing than we're accounting for. It would dilute the pollutants more so than we're modelling it.

BY MS. ROSENFELD:

Q And looking at the last sentence on page 150 of the Panofsky paper, it says Miaki's treatment gives only the geometry of the interface, but not the change of wind speeds, stress, and turbulent intensity after the air comes under the influence of terrain change. Are those factors that need to be calculated independently of this formula that's shown on page 150?

A For this analysis we did not have to do that. You certainly can do that, and there's references that show what the speed change would be and what the turbulent intensity change would be. This formula is to define the height of the adjusted surface.



Q But isn't dispersion directly affected by wind speed and turbulence?

A It's affected by both.

Q So why didn't you have to factor that into this equation?

A Well, I mentioned, I looked at, there's a reference that I mentioned earlier, Raynor 1979, that evaluated from a turbulent intensity point of view what the speed of transfer was. And what he concluded, in the first kilometer it's quite fast, a slope of one-to-three to one-to-four. We have a one-to-four in this formula, and that's considering turbulent intensity. So yes, I mean this scale of analysis, this close to an interface, that slope change is very quick, and even quicker than I'm showing on page 35, because a lot of times that surface is unstable.

In other words it's a, there's going to be a faster upward signal than showing what this formula is based on neutral conditions. So you put it all together for, as I mentioned here, for any conceivable surface roughness value. That transition occurs prior to the wind reaching the start of the gas queue, and is way past by the time it gets to the midpoint or end of the gas queue. It's going to be urban-related dispersion conditions at that location.

Q And the article also says --

UNIDENTIFIED SPEAKER: You mean the textbook?



MS. ROSENFELD: The textbook. It may say it, but I can't find it, so --

MR. GROSSMAN: I'll think we've spent enough time on the textbook, don't you think, Ms. Rosenfeld?

MS. ROSENFELD: Well, I think what Mr. Sullivan has testified is that his formula does not directly correlate with the formula that he, that is shown on page 150 of the Panofsky article.

MR. GROSSMAN: That's certainly not what he testified. He didn't say that. He said he derived from that by rearranging, substituted the values and then he rearranged it and solved for X. That's what he testified.

MS. ROSENFELD: And I think I asked him to walk us through that and he declined to do so.

MR. GROSSMAN: Well, he said he's not going to go, he actually did walk you through and told you what each of the elements was in that formula. He didn't say, he didn't go through the calculation of how he did it. But you can have your expert testify if he disagrees with the reformulation of it.

BY MS. ROSENFELD:

Q On page 36 of your report you reference a paper by Lettau (phonetic sp.), and you cite to a formula to estimate surface roughness in a parking area. Z-O equals .5 H* S/S, right?

A That's correct.
Q And did you plug in the value for this equation for Z-O or surface roughness into the equation in the Panofsky text?
A In the Panofsky text I ran, I mean I showed the results for Z, a surface roughness ranging from .01 meters up to one meter for, basically for 10 centimeter increments. I show it for a wide range of surface roughness values. I highlighted 12 centimeters, which came out of the example that I showed here.
Q And where did you show those numbers?
A On page 38.
Q And so what's highlighted on page 38 is the result that you got from the combination of the formula on 35 and the formula on 36?
A On page, using the formula for surface roughness estimation at the top of page 36, in conjunction with the formula on page 35, I computed the range of heights to achieve adjustment as a function of surface roughness ranging from .01 to 1 meter.
Q And so in the first column on the left, the Z-O, what does that reflect on the ground?
A Surface roughness length, one centimeter.
Q And the middle column?
A Actually be the distance in meters to, for



adjustment to 1.5 meters. And the third column is showing it in feet.
Q And the distance to 1.5 meters is the height of the vehicles or the height of the receptors?
A 1.5 meter, .75 meters is the height, midpoint height of the gas queue. 1.5 meters is the breathing height. I used 1.5 as the example, but actually the gas queue at .75 adjusts twice as fast as I have here. So at 12 centimeters, at .75, it would adjust within about eight feet. By the time it got to the middle of the ring road, it'd be urban.
Q And did you find any precedent in EPA guidance for the combination of these two equations?
A I don't recall if EPA has the need to address interface. I don't remember them addressing this topic in guidance. They may have somewhere. I've certainly seen these, the formula, these formulas used many times before.
Q In combination?
A Well, I don't know about in combination, but the Letteau method is very well established and tested against various methods. And the Panofsky equation is just one of many that leads to about the same answer, again the slope of one-to-three, one-to-four, when you're that close to an interface is what I've seen in multiple references.
Q Can you specify which other methods give you the



same result as the Panofsky formula?
A I mentioned Raynor, R-A-Y-N-O-R, in 1979 would be one.
Q And is that an article or a book?
A That's an article. I'll give you the reference. It's an article by Gilbert S. Raynor. The title is Formation and Characteristics of Coastal Internal Boundary Layers During On-Shore Flows. And published by, in Boundary Layer Meteorology, Volume 16, 1979, page 47 to 514.
Q Do you have a copy available?
A I do.
Q Electronic?
A I do.
Q Okay. Would you mind sending that to us?
A I can put it, I can transfer it through maybe Mr. Goecke. I have it on my flash drive.
Q Okay.
A I would have to do it, with the transfer.
Q We can coordinate that during the break. And did you conduct any kind of a sensitivity test to determine how variation of the inputs under these formulas would determine the outcome of the analysis?
A Yes.
Q And where did you do that?
A Page 38.



Q And the sensitivity test that you ran on 38, is that for the Panofsky or is that for Lettau?
A That's for Panofsky. I'm very, I'm showing Lettau's method for the parking lot example that I gave. It could be different on a different day with different cars parked there, but the given example was 12, .12 meters. I showed the sensitivity from .01 to 1 meters, run through the Panofsky equation. And showed a range of .7 feet to 38 feet for transition, which is well before the queue, for all of them.
I could add to that that I also considered .5 centimeters, which is five millimeter roughness, which is, we measure this in the field studies that we do, this sort of thing. And if I have a study where I have a plastic tarp for several acres of farmland, totally smooth surface, will measure about a five millimeter or .5 centimeter roughness length. And I put that in and I got 50 feet, and 50 feet was about the distance from the edge, where the southern part of the parking lot, parking space is in the ring road, up to the start of the ring road.
So my point is under any conceivable surface roughness value, the transition is faster than needed. It's going to be urban by the time it starts the queue. By the time it ends the queue it's going to be, that height of interface would be well, way above 1.5 meters.

MS. ROSENFELD: Mr. Grossman, I think this would be a good time for a lunch break, if it's not too early.
MR. GROSSMAN: I'm not so sure. Maybe you can finish before a lunch break.
MS. ROSENFELD: Oh, no, no.
MR. GROSSMAN: I would be hopeful that you could.
MS. ROSENFELD: Oh, not a chance.
MR. GROSSMAN: How much more do you think you have?
MS. ROSENFELD: Probably a couple hours.
MR. GROSSMAN: That's what you had, that's what you told me I think before we broke for the --
MS. ROSENFELD: That may be.
MR. GROSSMAN: -- on the 8th.
MS. ROSENFELD: That may be.
MS. CORDRY: I think you said four or five hours.
MR. GROSSMAN: It's now been --
UNIDENTIFIED SPEAKER: You said about three.
UNIDENTIFIED SPEAKER: You said four.
UNIDENTIFIED SPEAKER: Two and a half.
UNIDENTIFIED SPEAKER: Three.
MS. ROSENFELD: This is complicated stuff, Mr. Grossman. And I don't think the time this morning in cross-examination was wasted time.
MR. GROSSMAN: I would never assume it's --



MS. ROSENFELD: There was a lot of information that --
MR. GROSSMAN: -- wasted.
MS. ROSENFELD: -- came forward that certainly hadn't been clear to me, and to Mr., to Dr. Cole earlier. There's a lot more to wade through.
MS. CORDRY: So this is a 55-page report, all of which was new, so --
MR. SILVERMAN: Also, Mr. Grossman, Ms. Rosenfeld sacrificed Mother's Day in order to prepare for this. I think we should give her a little leeway.
MR. GROSSMAN: All right. The Mother's Day argument always wins. I don't want to be taking that thing against Mother's Day, for heaven's sakes. All right. Well, if everybody wants to do that now, and Mr. Silverman is voting to break for lunch, all right, I have no opposition from the other side. All right, we'll break. It's about, it's going to be about 20 to, so we'll break until 1:30 then.
MS. ROSENFELD: Thank you.
(Whereupon, at 12:35 p.m, a luncheon recess was taken.)
MR. GROSSMAN: Back on the record. Resume the cross-examination. Or end the cross-examination, whichever is your preference.



MS. ROSENFELD: Well, we were able to --
MR. GROSSMAN: Shorten things?
MS. ROSENFELD: -- delete a number of --
UNIDENTIFIED SPEAKER: Another way.
MS. ROSENFELD: -- a number of questions that we covered pretty thoroughly this morning, so.
CROSS-EXAMINATION (Continued)
BY MS. ROSENFELD:
Q Mr. Sullivan, you've testified that you're assuming that there's going to be a 25 percent initial ratio of NO2 to NOX, correct? The in-stack ratio?
A We've conservatively used .25 as our in-stack ratio for each source for NO2 modeling.
Q And if you would please turn to page 5 of Exhibit 407, which is the March 1, 2011 Tyler Fox memo.
MS. ADELMAN: What page was that?
MS. ROSENFELD: Five.
THE WITNESS: Page 5, you said?
MS. ROSENFELD: Yes.
THE WITNESS: All right.
BY MS. ROSENFELD:
Q Under the second bullet on page 5, there's a sentence that says general acceptance of .5 is the default in-stack ratio of NO2/NOX for input to the PV, MLM, and OLM options within AERMOD, in the absence of more appropriate



source-specific information on in-stack ratios. That .5 default number is recommended by this EPA guidance, is that correct?
A No. That's not what it says. What it says is if you don't have source-specific information, which we do, that .5 is the default.
UNIDENTIFIED SPEAKER: We do? What source?
BY MS. ROSENFELD:
Q And where is your source-specific information for using something other than the .5?
A We showed CAPCOA 2011. We discussed that earlier. Appendix D, page number, appendix C, I'm sorry, page 58, shows that for gasoline and diesel light and medium duty vehicles, the recommended ratio is .25, 25 percent. And for heavy duty diesels that it's 11 percent. We used 25 for both categories, and we used that not only for idling but also for running sources, running vehicles.
Q If you did use the EPA's .5 default ratio, what would your overall maximum NO2 concentration be under stage two?
A Well, we didn't run the numbers. I don't have a basis to answer that. But it wouldn't be appropriate to use .5 when, for example, I've already stated that the .25 we're using is high relative to the literature. I used CAPCOA as a conservative default.

Q And your reliance on that .25 figure in the CAPCOA report, Exhibit 567, it's appendix C, page 58, is that what you're referencing?
A Yes.
MS. ROSENFELD: Mr. Grossman, I believe I have your copy.
MR. GROSSMAN: Ah, that's what happened to it. Thank you. So what page am I on now, Ms. Rosenfeld?
MS. ROSENFELD: I believe Mr. Sullivan testified that he got the .25 conversion factor from appendix C on page 58. And if you look at number six, the reference number on the left-hand column, if you read across the page for the gas/diesel --
MR. GROSSMAN: I see.
MS. ROSENFELD: -- it's .25.
BY MS. ROSENFELD:
Q Is that correct? Is that the number you referenced?
A It's .25 for light and medium duty gas and diesel vehicles, and it's .11 for heavy duty diesel vehicles.
Q And do you know where that number came from in the CAPCOA guidance document?
A You mean how they derived that point? I don't have that information available as I sit here. I can tell you that I researched the .25, for example, for gasoline



vehicles, and have confirmed that that 25 percent is very high for moving vehicles, and it's a bit high. Twenty percent would be, based on the literature, more site-specific or source-specific information. These are basically just defaults that they're offering.
But I do provide references, other things like Lenner and Lindquist, for example, that show references as a function of runtime for idling. That's in my reference list.
Q If you were to turn to page 59 in the CAPCOA report --
A Okay.
Q -- reference number six, there's a reference to a study called Primary NO2 Emissions from Road Vehicles in the Hatfield and Bell Commons Tunnels --
A Right.
Q -- dated July 2007. Do you see that?
A I do.
Q Are you familiar with the Bell and Commons study?
A I've seen, I think I referenced in my reference list probably three or four tunnel studies. I don't recall this specific tunnel study, but I have certainly seen tunnel studies used as a basis to isolate the direct emissions from vehicles.
Q And do emissions in moving vehicles depend in part



on the speed of the vehicles?
A You're referring to this particular reference?
Q Just generically speaking.
A It's a function of speed.
Q We heard testimony that there are higher emissions at idling levels than there are at faster speeds, correct?
A That's what's shown in Lenner and Lindquist's reference in my reference set. It provides hard data on that.
Q And does the NO2 to NOX ratio change as vehicle speed changes?
A Yes, it does.
Q And in what fashion?
A Well, the literature shows, and in Lenner and Lindquist there's a good example of it, it shows, as I recall initially if you have a car running, and say for 30 minutes, that's moving 20 or 30 minutes, and then you put it into idle mode, it initially goes go about 15 percent ratio. And then by about 10 minutes into this, into the idle mode, it'll go to about 20 percent. It'll max out around 25 percent by 20 minutes or so. So it does increase, but the moving vehicle component, based upon several tunnel studies, shows that moving vehicles typically in the range of five to 10, sometimes three percent NO2.
MR. GROSSMAN: Excuse me a second. Mr. Brann, can



you take a look at the thermostat and see what that's set for? It seems rather warm in here.
MR. BRANN: It's 74.
MR. GROSSMAN: Okay, can you lower that a couple of degrees? Thank you.
MS. HARRIS: He asked if I could --
MR. GROSSMAN: You look guilty.
UNIDENTIFIED SPEAKER: She did, didn't she?
MS. HARRIS: Now I look content and comfortable.
MR. GROSSMAN: Well, you don't want me to look asleep.
MS. HARRIS: Well, that is true. You're more important.
BY MS. ROSENFELD:
Q In the Boulter, McCrae & Green study that's referenced in the CAPCOA guidelines, guidance document, do you happen to remember the speed of the vehicles that were studied in that report?
A I've already stated I have, I don't recall that report. But the, to interpret a tunnel study, it's more than just a function of speed. It depends upon the design of the tunnel. Some of these studies, this being one of them, were in single bore tunnels. And a single bore tunnel, single bore tunnels have very different ratios, because you get build-up inside, where a dual bore, the cars

have like a piston effect and it clears the air much, much more efficiently.

And so I've seen a big difference between single and dual bore tunnels. And I don't know if this is single bore or not, but levels like 25 percent I've seen in single bore tunnel studies.

Q But let me clarify, what we're talking about right now is the in-stack ratio, correct?

A But you're talking about a particular reference for a tunnel study, and I'm just pointing out that the ratio is strongly dependent upon whether it's single or dual bore. And we don't, without having this reference here, I don't recall which it is, but it's much more similar to single bore research I have reviewed.

Q The title of the document though is called Primary Emissions from Road Vehicles.

A Well, I'm referring to whether it has one hole through the mountain or two, or under the water. It makes, the literature shows it makes a very large difference. In fact they've done studies of single bore where they describe the piston effect in great detail, and say it does create build-up inside, and the residence time it increases, you get more conversion.

Q I'm sorry, Mr. Sullivan, I didn't hear your answer there.



MR. GROSSMAN: It's the same as he's given before, a couple of seconds ago. There's a big difference between single bore and double bore --

MS. ROSENFELD: Right.

MR. GROSSMAN: -- tunnel results, because of the piston effect.

BY MS. ROSENFELD:

Q But my question is does that have an effect on the in-stack ratio?

A Yes, it would. I mean if you used a single bore tunnel, which is, as number six may be, it would inflate the estimate of direct emissions, because there'd be enough time inside there to create extra conversion. And I'm looking for the reference. I may not find it right now, but it's clearly described, and I believe it's actually, let me see this that the rest of you have, it's an article by Oddny, I-N-D-R-E-H-U-S, CO and NO2 Pollution in a Long Two-Way Tunnel, road tunnel, investigation of NO2 to NOX ratios, and modelling of NO2 concentrations, in the Journal of the Royal Society of Chemistry, 2001. And actually the title of the journal is Journal of Environmental Monitoring, excuse me, 2001, volume three, pages 220 to 225.

Q What were those pages again?

A 220 to 225. I don't believe that report is in my data disk, that report clearly is available in the



literature. That does describe and comment on the fact that this tunnel produced high NO2 to NOX ratios because of the design.

Q And would you provide that along with the other, the report that you're going to provide, in the drop box?

A Yeah, is somebody keeping track of these things? I'm not.

Q I am, yes.

A Okay.

Q On page 34 of your report --

MR. GROSSMAN: Do you mean his rebuttal report?

MS. ROSENFELD: The rebuttal report.

MR. GROSSMAN: Okay.

BY MS. ROSENFELD:

Q And actually I'm going to start at the bottom of page 35, the last sentence. The modeling in stage three was updated based on updated meteorological data and updated NO2 background and ozone concentrations for the years 2010 through 2012, to reduce the positive bias of using older concurrent NO2 background data. Correct?

A It's page 34, I believe you're reading from.

Q The last, the sentence actually begins at the bottom of page 33 and carries over to page 34.

A Okay. I'm with you now. I'm sorry, what was your question?



Q Did you reduce the, you used three years of data for the updated NO2 background and ozone concentrations, correct?

A That's correct.

Q And did you also use three years of the meteorological data?

A It's all concurrent data, 2010 to 2012, three years.

Q And did you use EPA, did you follow EPA guidance in using this approach?

A It's the exact, we went through that earlier. It's the same approach as used previously. It was stage three, of using three years' worth of data. Three years is a typical data set used for compliance purposes. We used a three year data set for that purpose here. I always use three years of the model values to estimate model of NO2 concentrations.

Q Would you look at Exhibit 391-A, which is the June 29th, 2010 memo?

A What memo?

Q June 28th, 2010 memo from Tyler Fox?

A I don't have that handy. Mine was marked for 2011.

MR. GROSSMAN: Exhibit 391?

MS. ROSENFELD: 391-A.

MR. GROSSMAN: Yeah, that's --
MS. ROSENFELD: And actually, Mr. Grossman, I think I handed out --
MR. GROSSMAN: You handed one to me.
MS. ROSENFELD: -- a convenience copy. Right, it says excepted pages?
MR. GROSSMAN: Yes.
MS. ROSENFELD: Yes. Okay.
BY MS. ROSENFELD:
Q The second memo on that, which is dated June 28th, 2010, I'm looking at page 17 of that document. Mr. Sullivan, I'm going to hand you what is an extra of what has been marked as Exhibit 391-A.
A Okay.
Q And I'm going to need that back.
A All right.
UNIDENTIFIED SPEAKER: What page is that?
MS. ROSENFELD: Seventeen.
THE WITNESS: What was your question?
BY MS. ROSENFELD:
Q I'm looking in the middle of that paragraph, about halfway down on the far right there's a sentence that begins, although the monitor design value for the one-hour NO2 standard is defined in terms of the three-year average, this definition does not pre-empt or alter the appendix W



requirement for use of five years of national NWS, National Weather Service, meteorological data, or at least one year of site-specific data. Do you see that?
A I do.
Q Did you use one year of site-specific data in lieu of the five years of NWS?
A No, we used of five years of meteorological data in stage two. Stage three, we did an example showing the most recent three years. So yes, we have run five years. Just like I said, working through it in three-year increments, we followed that procedure.
Q But you did not follow it in stage three, did you?
A In stage three I showed the most recent three years, the last part of that block. If you want to see the five years rolled through each step, that's in stage two.
Q And the following sentence says the five-year average, based on use of NWS data or an average across one or more years of available site-specific data, serves as an unbiased estimate of the three-year average for purposes of modeling demonstrations and compliance with the NAAQS, correct?
A I guess I lost track of where you are. I'm sorry.
Q The following sentence.
A Modeling of rolling three-year averages?
Q Starting with the five-year average, based on use



of NWS data.
A I don't see this.
MR. GROSSMAN: It's right after the sentence that she read before. The sentence she read before says, it begins with although. The next sentence begins the five-year average.
THE WITNESS: I'll find it. The five-year average, based on use of National Weather Service data?
BY MS. ROSENFELD:
Q Yes.
A Or an average across one or more years of available site-specific data. Like I said, we have done that procedure in stage two. Stage three was showing what it would be for updated conditions.
Q And you could have carried forward the more recent five years of data, correct?
A We could have run --
Q But chose not to do that?
A We could have run many different variations of this. I ran basically two, and we could have run five years or more. I showed in stage three an example, based on the most recent three years, that would give Mr. Grossman the best idea of what kind of concentrations conservatively would expect to see when the station's built sometime in hopefully 2014 or whenever it's going to be.



Going back five years there, we could have done it, but it would show what the average would be going back to 2010. That's already available through stage two.
Q And just for a reference point, if you would turn to Exhibit 285, which is appendix W.
A I don't have appendix W handy.
Q In your references --
MR. GROSSMAN: Which page in index W?
MS. ROSENFELD: -- oh, actually you didn't reference appendix W, did you? I'm sorry, what?
MR. GROSSMAN: Which page were you referring to?
MS. ROSENFELD: I'm looking at page 68244.
THE WITNESS: Okay.
MS. ROSENFELD: Section 8.3.1.2.
THE WITNESS: What page again, please?
MS. ROSENFELD: 68244.
THE WITNESS: And I don't have it numbered that way. What is the section again?
MS. ROSENFELD: In the first, do you have page 68244?
THE WITNESS: No. Mine aren't paginated that way. I have 71 pages.
MS. CORDRY: His isn't the Federal Register. It's a CFR.
MS. ROSENFELD: All right, if you could look at

section 8.3.1.2, recommendations.
THE WITNESS: Okay.
MR. GROSSMAN: Unfortunately the new zoning ordinance is numbered the same kind of way. A lot of numbers, a couple letters thrown in. It's not that easy to follow.
THE WITNESS: Is there a pending question? I'm sorry.
BY MS. ROSENFELD:
Q I was waiting for you to find the section.
A I have it.
Q Okay. And recommendations under A, the very first sentence does say five years of representative meteorological data should be used when estimating concentrations with an air quality model, is that correct?
A Correct.
Q In lieu of EPA guidance, what did you rely upon in reducing this five-year meteorological data requirement?
MR. GROSSMAN: Well, I'm going to stop you, because he's already answered at least three times that he used five years in stage two, and then he used three years in stage three, the more current years.
MS. ROSENFELD: Right, and --
MR. GROSSMAN: So when you say in lieu of EPA guidance, he has testified that it is consistent with EPA



guidance. So why go over the same thing over and over and over again?
MS. ROSENFELD: No, I don't think he's testified that's it's consistent with EPA guidance. I think he's testified that he chose to use a different methodology.
MR. GROSSMAN: I heard him say that the five-year, that he did consistent with EPA guidance, because he used five years in stage two, and then he, in addition, ran a three-year one. I don't, he said it over and over again.
MS. ROSENFELD: Then let me --
MR. GROSSMAN: I just don't want to go over the same territory over and over and over again.
BY MS. ROSENFELD:
Q Are you asking that the Board of Appeals rely on stage three in making a determination as to compliance with the NAAQS?
A I'm hoping that the Board of Appeals will rely upon all the evidence that's presented here to make their decision. And we have done a lot of analysis for this project. I tried to shed light on the most recent period versus the five-year period. We showed the modeling I don't know how many different ways during the course of this activity. Why would not the whole evidence be considered?
Q Under your stage two approach --
MR. GROSSMAN: Your pocket's about to explode in



the back. Oh, it stopped.
MR. GROSSMAN: No, there's a bright white light that flashes in your pocket.
UNIDENTIFIED SPEAKER: Oh, this.
MR. GROSSMAN: And I wouldn't care, except it's distracting when I'm seeing it from here.
UNIDENTIFIED SPEAKER: I'm sorry. Okay. Sorry.
BY MS. ROSENFELD:
Q You applied an upper bound of .5 for the ratio in your stage two approach, is that correct?
A You heard the stage three approach?
Q Stage two.
A No.
Q For the area outside? That's actually stage three, correct?
A That's correct.
Q Okay. And you say you drew that from an Environmental Agency report that you reference in your rebuttal report, is that correct?
A I testified there was three or four studies that I listed for, on that topic, that all showed that it would take a long, long time to get to 50 percent, much longer than the grid we had in this modeling.
Q And in the environmental agency report, which was number one in your reference list, this actually, this is



not the United States Environmental Protection Agency, is it?
A No, we've talked about, in the reference number one on my list, no, we've mentioned it's the Australian, it's an Australian regulatory agency.
Q Actually I believe it's Bristol, the United Kingdom and Wales, I think.
MS. CORDRY: Yeah, yes.
MR. GROSSMAN: They all have the same accents.
UNIDENTIFIED SPEAKER: True.
BY MS. ROSENFELD:
Q This is on page 3. The Environment Agency is a leading public body protecting and improving the environment in England and Wales, correct?
A I had the wrong part of the British Empire. It is England and Wales.
Q And on page 10 of that report, doesn't it include that it can be as high as .59 at urban background sites? And even as high as .85 in urban areas, rural areas?
A Well, sure, but that's not what we're talking about. That's not an in-stack ratio. That's how you could measure in a city. That city has transport from tens of miles, from various roads and power plants and what have you. It's like apples and oranges.
Q But that is how you're getting the .5 maximum that

you composed on your stage three analysis, correct?
A But it's apples and oranges. You can't compare the two types.
Q In what sense?
A Well, the .5 is referring to conversion, total conversion of NO2 to NOX from the sources we're talking about here. The .5 they're talking about here, the average of .47, that's across, if you've got a monitor in the city and you let it run, you know, over and over again, it's getting air from roadway segments 10 miles away and a power plant over in this direction. It has a lot of baking time in the atmosphere, and you're going to get conversion.
We're talking about in-stack ratios right next to a source. There is insufficient time to get the mixing to have that happen.
Q No, but maybe we're confused. We're talking about your stage three where you cap ozone conversion ratios outside of the tailpipe box at .5, correct?
A Well, yeah, but you say a capping. We're setting it at .5 in a mono-domain that just goes about 100 meters or maybe 200 at the most. We're talking about the .5 you're referring to here is where there's miles and miles of air coming in that's converted from the general mix of air in the atmosphere, from much farther away than the grid domain we have here.



Again, it's apples and oranges comparison. I could show a .5 right away from my modeling if I were to say look, I have stage three. I have 70, what 73 micrograms are coming from background. Background's about .6. We're using Baltimore as the example. If I work back to that end and factor in most of the roadways, I'm doing, I'm using .5 for most everything else. I only have .25 for a very small fraction. If I do a weighted average of all those numbers, it comes in about .5. I get the same kind of answer.
So my point is it really does depend. Background dominates, and background has about a .6.
MS. CORDRY: Is that a .6 conversion rate here?
MR. GROSSMAN: No, no, no, no, no.
MS. CORDRY: I'm just --
MR. GROSSMAN: You're not questioning. You already had your turn --
MS. CORDRY: Okay, I'm just trying to --
MR. GROSSMAN: -- and you already, you can talk to Ms. Rosenfeld --
MS. CORDRY: I'm just trying to understand what he was saying.
MR. GROSSMAN: -- but I want to make this as fair as possible. Usually only one witness questions from the side, okay?
BY MS. ROSENFELD:



Q That was a .6 conversion ratio?
A That comes from one of your reports, one of the ones you issued last Tuesday. It's called the pilot program, and done by Sonoma Research. It looked into Boise, Baltimore, a couple other cities. If you look at the ratios for Baltimore, for the more, the highest one, which would be the most rural one, it's a .6.
Q And in that Sonoma study, weren't the monitors there located between 7 and .5 meters of the roadway?
A They were near a roadway, but even in that context, I mean I don't have a blackboard, but you have to consider the geometry of the, what you're asking me. That roadway is the RAN and RAS sites --
Q I believe there were several roadways.
A I wasn't done, though. The RAN and RAS sites that were used in that Baltimore, for Baltimore in that Sonoma study, that stretch of roadway goes on for kilometers. So when you have, flow parallel to there you have kilometers for conversion. But much of the time the flow is coming from the perpendicular. When you have perpendicular flow towards a roadway, you don't get a lot of build-up, because it's going across a little stretch of the road. It's not building up over kilometers. So you're getting a lot ambient background contribution. You add all that up, you'd expect to get a .5, and you do.



But this situation here, I can get the same number if I just take my number that I'm working with, and we could take the time to do that, but it's going to come out around .5.
I mean if you go to, you go to the page you're talking about, stage three, and look at the culpability analysis on that page, it should be shown on page 13. You see the total is 121 micrograms, 76 of which are background, at about .6 ratio.
The road segments and the parking and ring roads, those all been modeled at .5. The only thing less than that is the gasoline station at 35 micrograms there is at 25 percent ratio. If you put all those numbers together and do a weighted average, it's going to be approximately .5, just like the number you just showed me in this report.
Q And is there background over the queue as well?
A There's background over the entire grid.
Q And where, how is that factored in here?
A I'm showing an example culpability table at the maximum location.
Q And you're --
MR. GROSSMAN: Ms. Rosenfeld, really, you are going over the same thing over and over again. He's already answered that question.
MS. ROSENFELD: Mr. Grossman, if we could have a

10-minute break, I think we'll be in a position to wrap up very shortly thereafter.

MR. GROSSMAN: All right. No more than 10, please.

MS. ROSENFELD: Yes, no more than 10.

MR. GROSSMAN: Because I do want to finish this witness --

MS. ROSENFELD: Yes.

MR. GROSSMAN: -- and move on.

MS. ROSENFELD: I understand.

MR. GROSSMAN: We also have Mr. Silverman's 10 minutes of examination.

MS. ROSENFELD: I understand.

MR. GROSSMAN: Thank you.

(Whereupon, at 2:14 p.m., a brief recess was taken.)

MR. GROSSMAN: Ms. Rosenfeld.

CROSS-EXAMINATION (Continued)

BY MS. ROSENFELD:

Q Mr. Sullivan, I'm going to show you the exhibit that has previously been marked as Exhibit No. 230, which is the illustrious site plan. I will proffer to you that there is a red circle, basically a red circle drawn around the queue area. And I proffer that was drawn by Ms. Adelman, and I'll have her testify later to authenticate that if



necessary.

MR. GROSSMAN: I can see a red mark around it, so I don't think you have to authenticate that.

MS. ROSENFELD: Okay, and --

MR. GROSSMAN: But you can move it a little bit closer to you so I can actually see it better. Thank you.

UNIDENTIFIED SPEAKER: I'm not going to be looking at it.

MR. GROSSMAN: We have a, an easel, if you want it.

UNIDENTIFIED SPEAKER: It's questionable equipment.

MS. ROSENFELD: Mr. Grossman, perhaps we could just mark this Exhibit No. 230-A.

MR. GROSSMAN: Okay.

(Hearing Exhibit No. 230-A was marked for identification.)

BY MS. ROSENFELD:

Q And Mr. Sullivan, that red line reflects generally 40 meters outside of the queue area. In looking at that, do you have any reason to think, would you agree that that generally shows that 40-meter distance?

A I can't confirm it is drawn exactly right, but that's, you know, generally reasonable. The scale is correct. There'd be a location around there that's so



close, it's about, this is the, this width is 40 meters. The queue actually, the queue isn't the whole exception area. The queue area, which is approximately in the southern, southern to central portion of this. I don't have the exact location here, but it's a 40-meter by 20, 40-meter east-west, 27 meters north-south --

MR. GROSSMAN: Okay.

THE WITNESS: -- rectangle. So we're talking about 40 meters outside of that, not the special exception. I'm not sure it's exactly right --

MR. GROSSMAN: But it's in the general ballpark.

UNIDENTIFIED SPEAKER: Oh, yes.

THE WITNESS: -- the generally, let's say it's approximately the right ballpark.

MS. CORDRY: Ms. Adelman says it's exactly right.

THE WITNESS: To the gas queue, or to the --

MS. CORDRY: To the gas queue.

THE WITNESS: Okay.

MS. CORDRY: She did, I watched her. She was very careful.

THE WITNESS: The loading dock is here. It'll extend somewhat further out this direction. But let's say it's approximately right, 40 meters or so, approximately one area source width.

BY MS. ROSENFELD:



Q And is there a similar boundary around the loading dock area, or you've just treated everything as that 40-meter boundary outside of the queue?

A We have a, the loading dock and the queue on, that I've shown on this map, it's, they're all the receptors within 40 meters of the, those sources are treated as being far too close to have any significant conversion. It's --

Q But you don't have a similar perimeter around the loading dock, do you? You just have the one tailpipe box.

A Any receptor that's within 40 meters of the loading dock source or the queue are considered part of your, what is it called, tailpipe box.

Q So --

A This receptor is not just necessarily a box, but it's the receptors that are in that zone.

Q So for purposes of looking at the conversion ratios, should Ms. Adelman have drawn a similar 40-meter circle around the loading dock?

A Basically if you look at our modeling files, and look at where the receptors are located, and exclude receptors that are within 40 meters of the source, that'd be the best way to look at it.

MR. GROSSMAN: But I mean to understand, and I think what Ms. Rosenfeld is getting at, you say 40 meters from the source. The loading dock is one of the sources.

THE WITNESS: Right.
MR. GROSSMAN: But we've only talked about one 40-meter area here. But then there would actually be two 40-meter perimeters, one around the queue and the other around the loading dock. Or is that not correct, is there just one?
THE WITNESS: There's one. They overlap. Those two zones would overlap. It's the zone that would include all the receptors out in the vicinity of the loading dock, as well as the gas queue itself. That's all one big basic zone.
MS. ROSENFELD: So what we need is a --
MR. GROSSMAN: Well, I understand they would overlap, but I'm asking you would it also extend 40 meters to the east of the loading dock?
THE WITNESS: Yes, it would.
MR. GROSSMAN: Okay. So there is a separate circle that we could be, we should be talking about, in effect.
THE WITNESS: Yeah, the scale of this map, this is 100.
UNIDENTIFIED SPEAKER: That's 100.
MS. ADELMAN: An inch to 100.
THE WITNESS: A hundred feet. It would go further out past, to the east, the loading dock area, than you



probably have drawn here.
MS. ROSENFELD: So it would almost be like a Venn diagram if you did the entire.
THE WITNESS: It's sort of a rectangle, more or less, but it depends how the receptors fall, but that's the best way to explain that.
MR. GROSSMAN: Okay.
MS. ROSENFELD: Okay. I have no further questions.
MR. GROSSMAN: Okay. Mr. Silverman, you're up.
MR. SILVERMAN: Good afternoon.
MR. GROSSMAN: Good afternoon.
CROSS-EXAMINATION (Continued)
BY MR. SILVERMAN:
Q Mr. Sullivan, I want to ask you about, as I let your counsel know, I want to ask you about Exhibit 342, which is the CRC report, number A-79.
A All right.
Q Are you familiar with this report?
A I've read that report, yes.
Q When did you first learn about it?
A I don't recall.
Q Did you, as I recall Mr. Goecke questioned you about this report, and he thought we had put it in, but we hadn't. Were you the one who recommended this report to Mr.



Goecke?
A I believe I independently found this report. You may have found it as well. I don't know. But I found this report through my search.
Q Okay, good. Now during your testimony you talked about nationwide data. Was this report an element of the nationwide data you were referring to?
A I was referring to, for example, nationwide data. If you go to air data, EPA web site, and you say I want to know, I want to see all the NO2 monitoring sites in the United States for 2013, and identify what's the highest reading, 98th percentile, in the entire country last year. It was 83 parts per billion, which is 156 micrograms per cubic meter. Highest anywhere in the country.
So I just think it's an important perspective. We talk about the 40 meters and the ratios and all these things, that the odds of the NO2 at this level being anywhere near 156 are remote. And that's why I'm saying 75 to 100 micrograms to me would be the top upper bound I'd expect to see here for 98th percentile.
Q Well, I think we have discussed how different regions of the country have designations relating to how close they come to meeting or exceeding EPA standards for the pollutants for which there are standards. And one of those pollutants for which there are standards, for which



there are designations, is NO2, is it not?
A That's what I was referring to. We have just made that statement.
Q And what is the designated standard for NO2 here in Montgomery County?
A Montgomery County has the same standard as the rest of the country. We're talking about 100 parts per billion, 190 micrograms per cubic meter.
Q No, not the standard but the designation how well we're doing in meeting or not meeting the standard.
A It's meeting the standard.
Q So it's your testimony that Montgomery County is at attainment?
A For NO2?
Q Yes.
A That's my understanding.
Q Well, in addition to a designation of attainment or non-attainment, are there any other designations that EPA sometimes makes?
A I think areas are threatened.
Q Did you ever hear about the designation of attainment, unclassifiable?
A I've heard it.
Q Are you aware that for NO2 the whole country has been declared in attainment?

MR. GROSSMAN: Well, do you have that in evidence, what you're about to assert? Or are you putting it in evidence?
MR. SILVERMAN: I could. I just, I thought he would know it.
MR. GROSSMAN: Well, no, the question, you're assuming a fact, and I just want to make sure that the fact you're assuming is either in evidence or about to be put in evidence in the surrebuttal.
MR. SILVERMAN: It is about to be put in evidence as soon as I can find the document.
BY MR. SILVERMAN:
Q Are you aware of a final rule that EPA put on February 17th, 2012? It says this rule establishes air quality designations for all areas of the United States for 2010 primary nitrogen dioxide, NEX. Have you ever seen that or heard about that?
A I don't recall if I've seen that or not.
Q Now I think I gave Mr. Goecke my copy of that last time –- one second. I'm actually surprised that Mr. Sullivan did not --
MR. GROSSMAN: Well, I --
MR. SILVERMAN: So I need a moment, if you would.
MR. GROSSMAN: Sure.
MS. CORDRY: I have the document on the computer



if you want to just read from here, or --
MR. GOECKE: May I give a copy to Mr. Sullivan?
MR. GROSSMAN: Certainly. And you have a copy to be marked for the exhibits?
MR. SILVERMAN: Actually, I do. So Mr. Goecke, in the interests of saving trees, I did not copy the whole document that I gave to you. But I did copy a fact sheet from the EPA web site, which is in substance the Federal Register report that I referenced, and I'll give you that.
MR. GROSSMAN: Is the fact sheet what you want to put in the record?
MR. SILVERMAN: I want to put the fact sheet in. If there's an objection --
MR. GROSSMAN: Okay, as long as Mr. Goecke has an opportunity to look it over and make sure that the fact sheet represents the report that you're referencing.
MR. GOECKE: I'm sorry, this is a fact sheet that you prepared, Mr. Silverman?
MR. SILVERMAN: No, no, EPA prepared this.
MR. GOECKE: Is this an excerpt from a --
MR. SILVERMAN: This is a summary of the February 2012 rule about the designation.
MR. GOECKE: But where does this come from?
MR. SILVERMAN: From the EPA's web site. And I have the rule. I only have one copy, but it's many, many



pages, and I thought --
MR. GROSSMAN: All right, well, I don't have a problem with having a smaller exhibit.
MR. SILVERMAN: Good.
MR. GROSSMAN: As long as it reflects the report that you're referencing.
MR. SILVERMAN: Yes.
MR. GROSSMAN: So let's mark this as Exhibit 570. And this is fact sheet from EPA web site with air quality designations for 2010, primary NO2, NAAQS. All right.
(Hearing Exhibit No. 570 was marked for identification.)
MR. SILVERMAN: All right. And this is a reflection of a 2012 February 17th Federal Register final rule, which I've given to Mr. Goecke.
MR. GROSSMAN: All right.
BY MR. SILVERMAN:
Q So are you aware now that all areas of the country have indeed been classified as in attainment? But then these areas have also been designated as unclassifiable attainment?
MR. GROSSMAN: Well, which areas? I can't tell from, what, just show me the particular line you're talking about that says that all areas of the country --
MR. SILVERMAN: It says action, February 20th,



2012, based on the most recent --
MR. GROSSMAN: Mine doesn't say February 20. Mine says January.
MR. SILVERMAN: January, sorry, January 20th, U.S. Environmental Protection Agency determined that no area in the country violated the 2010 national air quality standards for nitrogen dioxide.
MR. GROSSMAN: Right.
MR. SILVERMAN: Which is what Mr. Sullivan just testified to. Then it says these areas have been designated as unclassifiable attainment.
MR. GROSSMAN: Sure.
BY MR. SILVERMAN:
Q Have you heard of unclassifiable attainment before?
A Well, actually I don't recall hearing that term before, but they just passed a new standard in 2010.
Q They did.
A And they felt they didn't have sufficient network coverage to make a determination, and then they expanded the network. And I just read what the maximum was in the United States in 2013 they referred to, and nothing was above 156 micrograms.
Q Didn't you testify before that the expansion of the network was going to take some time, and that they

planned to start in 2013, but they started in 2014, and --
A This is talking about expanding the network in cities and so forth.
Q Yes.
A We were talking about the near road. That's another aspect of it. Near road's coming along on line now. But I mean there are some near road monitors been around a while, like I-710 I read to you, and some other ones, and even those are not anywhere near the standard.
Q Okay, well, before we just leave this, why, do I understand you to say the reason that EPA uses the word unclassifiable is because there's a new monitoring system going in that's not in yet, and they don't quite know what the actual air quality is?
A You know, I don't interpret it that way. I interpret it being that they are going to expand their networks to get more complete coverage of other areas around, in large urban areas, to increase the monitors. In the highest locations they expect to get effects across broad communities to make sure that the standards are being achieved. It doesn't say anything about the monitors being defective. It says they need more data, which they, by 2013 I presume they have expanded those networks. And the second stage would be, as I understand it, to expand the near road networks which are happening right about now.



Q So has EPA rescinded its rule, making the whole country unclassifiable for NO2?
A I don't know if they have or haven't, but what I'm saying from the data I've reviewed, which I just read to you for 2013, it sounds like they will be, if they haven't done it yet. The standards --
Q They will.
A The standards aren't been approached, Mr. Silverman.
Q That's a little speculative, isn't it?
A No, it's not.
Q You don't know they, you were on from, you have never seen the unclassifiable designation before.
MR. GROSSMAN: I'm not sure, what are you asking me to understand from the term unclassifiable slash attainment? What does that mean?
MR. SILVERMAN: It means that there's a lot of doubt as to what, how much nitrogen dioxide is in the atmosphere.
MR. GROSSMAN: I don't know that, but do you have something that defines the term?
MR. SILVERMAN: Okay. My efforts to save my printing costs failed. I do have a document which Mr. Goecke also has, and maybe we could jump over this and I'll try to get some copies made.



MR. GROSSMAN: Well, does it have a definition in there of --
MR. SILVERMAN: It does.
MR. GROSSMAN: -- unclassifiable, the term unclassifiable slash attainment? You could just read it to me.
MR. SILVERMAN: Okay, that'd be good, if there's no objection to that.
MR. GOECKE: Which document are you referring to?
MR. SILVERMAN: This is the Federal Register final rule on nitrogen dioxide standards.
MR. GROSSMAN: And the date of that?
MR. SILVERMAN: The date is February 17th, 2012.
MR. GROSSMAN: Okay.
MR. SILVERMAN: Okay.
MS. HARRIS: Mr. Grossman, while he's looking for that, what exhibit number did this get?
MR. GROSSMAN: That is, 570 is the two-page fact sheet --
MS. HARRIS: Thank you.
MR. GROSSMAN: -- that purportedly described the final rule, February 17, 2012, that the EPA put out regarding NO2 standards.
MR. SILVERMAN: Yes, I think the critical line is the EPA and state agencies are currently --



MR. GROSSMAN: Where are you reading from, sir?
MR. SILVERMAN: I'm reading from the Federal Register notice.
MR. GROSSMAN: And what page?
MR. SILVERMAN: Section --
MR. GROSSMAN: It's usually in the top left-hand corner, if you're reading from the Federal Register.
MR. SILVERMAN: I'm reading from some, it's call the, it's the Federal Register. It says Federal Register.gov articles. The section number is, it's section number two. The purpose of this action --
MR. GROSSMAN: What's the section number?
MR. SILVERMAN: Section number, Roman numeral two. The purpose of this action.
MR. GROSSMAN: Okay.
MR. SILVERMAN: It says, the last paragraph of that, it's a four paragraph -- the EPA and state agencies are currently working to establish and expand the network of NO2 monitors expected to be deployed in 2013. Once three years of air quality data have been collected from the expanded network, the EPA will be able to evaluate NO2 air quality in additional locations.
MR. GROSSMAN: So that still doesn't answer my question.
MR. SILVERMAN: Okay.

MR. GROSSMAN: Why do I believe that the term unclassifiable slash attainment means that there are problems with air quality, as opposed to saying that they don't have the monitoring results yet to evaluate it?

MR. SILVERMAN: Okay. Yes, the section Roman numeral five, second paragraph, and maybe if Mr. Goecke doesn't have an objection I could put this into evidence, too.

MR. GROSSMAN: Well, what does it say? Does it define that term?

MR. SILVERMAN: Yes. It says the rule will also set new requirements for the placement of NO2 monitors. The rule being referenced was the change of standard, the NO2, lowering of the one-hour standard. The EPA and state agencies are currently working to establish an expanded network of NO2 monitors expected to be deployed in 2013. NO2 concentrations near major roads are appreciably higher than those measured at monitors in the current network. Monitoring studies indicate that near roads, within about 50 meters, concentrations of NO2 can be 30 to 100 percent than concentrations away from major roads.

The Clean Air Act requires the EPA to complete the additional area designation process within three years of promulgating a new or revised max. However, if the Administrator has insufficient information to make these



designations within that time frame, the EPA has the authority to extend the designated process by up to one additional year. And so --

MR. GROSSMAN: That doesn't answer my question either. I mean just on its face, I would take the term unclassifiable slash attainment, unquote, to mean that they cannot classify it with regard to whether it's in attainment, not that it's low or high --

MR. SILVERMAN: Right.

MR. GROSSMAN: -- they just can't classify it.

MR. SILVERMAN: Right.

MR. GROSSMAN: So I don't reach any pejorative interpretation of that, which is what you were implying.

MR. SILVERMAN: No, no, I didn't mean to suggest one thing or another. There is comment about near road being higher than other places. But I'm just suggesting that there's some uncertainty as to what the actual concentrations in the air are. That's the only purpose --

MR. GROSSMAN: Okay.

MR. SILVERMAN: -- of putting this in.

MR. GROSSMAN: All right.

MR. SILVERMAN: Okay. So good. Now let's, let me, Mr. Goecke, do you have an objection if I introduce this document, which I think I gave you?

MR. GOECKE: Go ahead.



MR. SILVERMAN: I'll produce the whole Federal Register notice for our next meeting, just so it'll be complete.

MR. GOECKE: Yeah, this is what you provided last time.

MR. SILVERMAN: Yes.

MR. GOECKE: You gave us one copy. Mr. Sullivan has it. I have no objection to you relying on it to ask him questions about this document.

MR. SILVERMAN: Okay, great.

MR. GROSSMAN: Would you mark this, Mr. Goecke?

MR. GOECKE: Sure.

MR. GROSSMAN: So this will be Exhibit 571, and although I'm running out of room on the page here --

(Hearing Exhibit No. 571 was marked for identification.)

MR. SILVERMAN: I see.

MR. GROSSMAN: -- so I hope you don't have any more. So what is this exactly? This is the Federal Register.

MR. SILVERMAN: It's a final rule from the Federal Register.

MR. GROSSMAN: This is the one you just were reading from, or --

MR. SILVERMAN: Yes.



MR. GROSSMAN: Okay.

MR. SILVERMAN: Explaining why the NO2 was unclassifiable.

MR. GROSSMAN: This is the February 17, 2012 Federal Register, a final rule from EPA on, I guess it's on measuring NO2, is that what you'd say?

MR. SILVERMAN: It's designating the attainment or non-attainment. It's just designating areas of the country --

MR. GROSSMAN: Okay.

MR. SILVERMAN: -- for attainment or non-attainment --

MR. GROSSMAN: Designating --

MR. SILVERMAN: -- attainment, non-classifiable.

MR. GROSSMAN: There it is. An attainment re: NO2. Okay.

MR. SILVERMAN: Take a quick look at that. And just to, not to put too fine a point on it, but at the end of the rule there's a list of all the counties in America. And it states whether they're in attainment, not attainment or attainment unclassifiable.

MR. GROSSMAN: Okay.

MR. SILVERMAN: And I want to just show that to you in case, at the bottom left, Maryland, and then at the bottom of the list it says Montgomery County.

MR. GROSSMAN: So we're unclassifiable attainment.
MR. SILVERMAN: We are unclassifiable for sure.
MR. GROSSMAN: Has that changed?
MR. SILVERMAN: No.
MR. GROSSMAN: Okay.
MR. SILVERMAN: Unless it, I'm not aware that it's changed.
BY MR. SILVERMAN:
Q Okay, let's go back to the CRC report. I think I was asking whether you relied on this report, assessment of near roadway NO2 concentrations, in saying that the national data suggests that we don't have NO2 problems.
A Well, I said two things. One, I said that this particular report showed a, perhaps one of the highways in the United States that has the highest potential for NO2 problem, and that would be I-710, which services the Port of Long Beach. And the reason I said that is it has 190,000 vehicles a day, about 30 to 32,000 of which are heavy duty diesel trucks servicing the port primarily. And if they didn't have an issue there, I'd be surprised if they have an addition, a problem at other highways. And as I said, this report does show concentrations that are well below the standard.
Q Okay, good. So does this report, was this, how many cities did this report look at?



A I looked at three or four, as I recall. I could look at it and give you a better answer.
Q Just take a look at that and make sure.
A They were clearly examples. It was Las Vegas, Los Angeles, actually just those two.
Q Just those two. And how many roadways in those cities did it look at?
A I didn't, how many roadways are in Los Angeles?
Q No, no, how many roadways did the report examine?
A When you say roadways, you mean how many sites did it examine?
Q How many sites, yes, how many sites?
A It had, as I recall, two sites at each location.
Q It had two sites at each location?
A Correct. I know there were two sites in I-710. We can look at the other one if you'd like. There's one designated as the west site, which is 15 meters from the highway.
Q Right.
A And the east site is 80 meters from the highway, both of which are downwind of the airflow.
Q Right.
A If you go to Las Vegas. They appear to have the Fife (phonetic sp.) Elementary School and a background station. I see it.



Q And the background station is some distance away, right?
A Correct.
Q So we're talking about three monitors near the road, is that right?
A We're talking about three near roadway monitors.
Q Okay. So was this a peer-reviewed report?
A It's unclear to me if it's peer-reviewed. It was produced by the Coordinating Research Council. Whether or not they peer-reviewed it or not, I don't know.
Q And what is the Coordinating Research Council?
A I don't know their history. They're a non-profit corporation supported by the petroleum and automotive industries.
Q Now with regard to Interstate 710, near the Ports of Long Beach and Los Angeles, are you aware of any activity in the last five years with the Ports of Long Beach and Los Angeles, to curb emissions from vehicles going back and forth to the ports?
A I've read a little bit about that roadway. I don't remember any specific special measures that they're taking. But the data that are in here would be within the last five years. It was 2010 and 2011 is what they're reporting.
Q And you're not aware of the fact that those ports



have taken extraordinary measures to curb air pollution in their area.
A Well, I don't, I haven't tracked different steps they've taken. But you're saying, suggesting it could have been higher earlier? I'm not sure what you mean.
Q Yeah, just, now you said that the --
MR. GOECKE: I'd like to object, to the extent I don't know if that's in the record or if he's going to, if he's proffering it, he's going to put it in the record.
MR. GROSSMAN: Are you proffering that there's going to be some evidence in the record that they've taken extraordinary means to reduce pollution in that area?
MR. SILVERMAN: That seems real peripheral. I thought he would know that. I know it is true, and I'm sure it is true. And I could --
MR. GROSSMAN: That's not --
MR. SILVERMAN: Right.
MR. GROSSMAN: -- quite the same --
MR. SILVERMAN: Right.
MR. GROSSMAN: -- you realize.
MR. SILVERMAN: I understand. Understood.
MR. GROSSMAN: And so usually, I mean you're allowed to ask leading questions --
MR. SILVERMAN: Right.
MR. GROSSMAN: -- and should ask leading questions

on cross-examination --
MR. SILVERMAN: Yeah.
MR. GROSSMAN: -- but you can't assume a fact that's not either in evidence or you are, or is not capable of being proved.
MR. SILVERMAN: Right, it's certainly capable of being proved, and we'll try to put, I was just surprised that Mr. Sullivan was not aware of those activities. They're huge, but --
THE WITNESS: I'm not aware of --
MR. SILVERMAN: Right.
MR. GROSSMAN: It may not exist, so he may not be aware of it.
MR. SILVERMAN: That could be, too. That could be, too. All right. I'll, I will, let me think about whether to build the record some more, but there's plenty to go.
BY MR. SILVERMAN:
Q Okay, so now one of the things discussed in this report is the debate within EPA as to whether to make the NO2 standard 80 or 100? Do you recall that?
A I do.
Q And with regard to the I-710, Port of Long Beach, if, what does the report say would happen there if the standard were lowered to 80?



A The, certainly that monitor 15 meters from I-710 would be over 80, as I recall.
Q It would be over 80. It would exceed 80.
A I would think it would.
Q It would exceed the standard, if the standard went down to 80. Okay.
MR. GROSSMAN: Eighty what?
THE WITNESS: PPB. I'm sorry.
MR. GROSSMAN: Okay. Parts per billion.
MR. SILVERMAN: Parts per billion, yes.
BY MR. SILVERMAN:
Q So and the authors expressed some concern about that, right? Where they alert EPA to the problem here.
A I don't remember it saying they alerted EPA to a problem.
MR. GROSSMAN: Do we have a leaky pitcher?
UNIDENTIFIED SPEAKER: Sorry about that.
BY MR. SILVERMAN:
Q Well, let me just read you a paragraph from the ES-2, the last paragraph. This study demonstrates that while both sites were below the one-hour NO2 max, a reduction of the max to 80 parts per billion would likely cause the Los Angeles location to be above the standard.
MR. GROSSMAN: I missed the last part of that sentence.



BY MR. SILVERMAN:
Q A reduction of the max to 80 parts per billion would likely cause the Los Angeles location to be above the standard. Now I want to go just briefly to your, I wish I had Ms. Rosenfeld's facility in organizing papers. I want to go to your --
MR. GROSSMAN: You didn't work all Mother's Day.
MR. SILVERMAN: Right, yes. I did not.
BY MR. SILVERMAN:
Q All right, so yes, I want to go to your, in your rebuttal report, figure two. And the heading on the, and this is on page 12. And you show the heading on the top, the last phrase, it says, there's a bracket. It says max equals 156 micrograms per cubic meter at certain points, is that right?
A It shows that below at the loading dock area. That's correct.
Q Right. So how do we convert that again to parts per billion? I've forgotten how to do that.
A You want to divide by 1.88.
Q So if we divide 188 by, into 156, what do we get?
A You want to do it?
MS. CORDRY: Anybody want me to divide?
MR. GROSSMAN: One-fifty-six by 1.88.
MR. SILVERMAN: One-fifty-six divided by 1.88.



MS. CORDRY: That would be 82.97 percent.
BY MR. SILVERMAN:
Q Well, actually at those two points the air quality in the, at the, in the area we're talking about, is worse than I-710.
A It'd be the highest in the United States, if that was correct.
Q If that was correct.
A I've already pointed out that the modeling here is extremely conservative, and the range would be 75 to 100. I feel very comfortable with that, Mr. Silverman. One-fifty-six occurred, I could find out where, but that's the highest in the U.S. last year.
Q The highest monitor. But this is not a monitored concentration. Yours is a model concentration, right?
A Mine is a very conservative modeled concentration.
Q Right.
A And it's surely not, wouldn't be measured at that spot.
Q Well, we have a, no, the CRC report at these two locations with the three monitors, was this a modeling report or was it a monitor, a monitored report?
A It was a monitoring study.
Q A monitoring study. Is a monitoring study, are they more accurate than modeling studies?

A Not necessarily. But it's directly measured, Mr. Silverman. It's a directly measured value over a period of two years, 15 meters from a very busy and congested road. I mean I-710 isn't just busy, it's congested. You read that, too. I mean it has a lot of issues.
Q Well, also there's quite a large difference between the Las Vegas site and the Los Angeles site, although the traffic seems to be comparable. Would you agree with that?
A Very different. Very different situation.
Q What are some of the differences?
A Well, one big difference is they have like one and a half percent diesel trucks in Las Vegas, and they have 15 to 18 percent diesel trucks servicing the Port of Long Beach. Diesel trucks, especially not clean diesels, you know, are putting out a lot of NO2.
Q Well, is it your impression that not clean diesels are allowed at the Port of Long Beach?
A I don't know for a fact. I assume there's a mixture servicing the port. But I don't know for a fact.
Q Well, I think I will proffer some evidence here. I can't do it today, but I'll put in evidence that they are verboten, they're forbidden --
A Well, except --
Q -- at the Port of Los Angeles.



A -- I'll accept that, Mr. Silverman. The issue is you have 30,000 heavy duty diesel trucks servicing that road every day. Whether it be clean diesel or whether it be, they be regular diesel, the issue is that is the primary difference between Los Angeles monitoring at I-710, and Las Vegas near Frye (phonetic sp.) school. They have many, their total counts are similar, but the actual amount of heavy diesels is very different.
Q So what you see as the difference. How about the presence of ozone, background ozone? You think that makes a difference?
A Well, it certainly can.
Q And what do the study's authors say?
MR. GROSSMAN: Mr. Silverman, let me stop you a second.
MR. SILVERMAN: Yes.
MR. GROSSMAN: Where is this really going to get us? In terms of the location, the subject site, as opposed to California.
MR. SILVERMAN: Well, that's exactly the point, Mr. Grossman, that I think one of the things Costco relies on, and I believe they rely on it in many ways, not just for evidence, but even perhaps psychologically. They rely on is that some of these very busy highways have, are you know, in the 80s or the 60s in terms of parts per billion, and



therefore we couldn't possibly be in exceedance of that.
MR. GROSSMAN: Right.
MR. SILVERMAN: And what I'm suggesting is that every situation is sui generis. If we had a 50-city study or a three-year study or a five-year study over a whole area, you can then use that kind of information, well, in Los Angeles, the Port of Los Angeles is not even exceeding 100 at this point. But to just pick a site somewhere, you know, find a report which is a very interesting report, certainly worth reading, and say oh, this tells us that we don't have anything to worry about in Wheaton I think is totally, it's --
MR. GROSSMAN: Right, and I'm not going to base any findings on what California measurements are. I'm going to base it on the evidence that pertains to this site, the subject site, so --
MR. SILVERMAN: is that your --
MR. GROSSMAN: -- I'm not sure where this gets you. I understand the points you're making.
MR. SILVERMAN: Yeah.
MR. GROSSMAN: That to the extent that the applicant draws comfort from the idea that even very busy sites have only a certain level, that's not to say that this site couldn't have more if your evidence shows that it has more. That's the question, what the evidence shows.



BY MR. SILVERMAN:
Q Yes, and do you agree with, do you rely on the, I mean in your report you reference the California I-710. You've referenced it several times here, so is this important in you reaching your conclusions, or is it important in validating your conclusions?
A Mr. Silverman, I think what's important, we're talking about a lot of complicated complex issues here. Ozone conversion of NO to NO2, various modeling issues. I was trying to provide perspective for the record, cut to the chase. Not just Los Angeles I-710, but the entire country, as I testified today.
If there's 822 reporting monitors in the U.S, and the highest one is 156, we're questioning will the loading dock at Costco produce higher values than that. I think it's an important perspective to cut through all the modeling issues and say what's the reality check. And the reality check is you're not going to get high values of NO2 at this ring road. We've modeled it. The measurements around the country show for much busier places than this, affected by power plants, highways, what have you, you're not seeing that kind of conversion. You're not seeing those kind of levels. That's all I'm trying to show.
Q Well, that's, I take it you're not going to --
MR. GROSSMAN: I understand.

MR. SILVERMAN: Right.
MR. GROSSMAN: I think that that's, I understand his basis for saying that. He's saying if you look all over the country, the highest you'll see is 156 parts, not parts per billion but micrograms per cubic meter of NO2. And hourly. And therefore he says it's very unlikely that this site would have that.
But if the evidence shows that this site has more, that's what I would go on. I understand his rationale. I'm not saying it doesn't exist. And I'm not, I didn't stop you from trying to undermine it. But the real direct evidence is what's going to control here.
MR. SILVERMAN: Well, I hope so. I mean really EPA is, why doesn't EPA change the rule about unclassifiable if this is all the evidence they need to reach a conclusion?
MR. GROSSMAN: Well, I don't think, he can't answer why the EPA does or doesn't do something.
THE WITNESS: Well, I did find the --
MR. GROSSMAN: Well, no, you don't have to, there's no question pending.
THE WITNESS: Sorry.
MR. GROSSMAN: I sustained my own objection.
BY MR. SILVERMAN:
Q At the Las Vegas site there was a wall, wasn't there?



A There was.
Q And isn't it a fact that that wall caused the authors of the study to scratch their heads and they were unclear as to how the wall would affect the accuracy of their readings?
A I wouldn't have put the monitor near a wall, on a wall myself, but yeah, I think that was a factor to some extent, yes.
Q So walls, what are some of the things that walls could do? Could they cause more turbulence and more mixing between NOX and ozone? Could they have that effect?
A They could do that. They could block. I think that a better site, and why I emphasize it, was I-710, which is an open area. It's right next to the road, nothing blocking it. The wall, yeah, I'd agree the wall will create more dispersion. It could create some zones that it will flow differently around the monitor.
Q Yes.
A Under certain wind directions that could happen.
Q Yes. Now we've had a lot of sort of tangential conversations about walls, but did you, in your latest rebuttal report did you model the wall?
A We can't model the wall. Nobody can really model that wall with AERMOD. However, the mall, the wall is simply going to add extra dilution, extra mixing. And as I



discussed before, we had these discussions in the past about any strange diurnal flows. Well, rather than flowing down the hillside, which we show won't happen anyway because of the fact that it's so hot on the mall, the wall would act as a blocking mechanism at night, much more at night than the daytime. Daytime it's going to go over the wall much more. At night it could flow around the wall.
MR. GROSSMAN: That testimony was probably a year ago now.
THE WITNESS: It was, at least.
BY MR. SILVERMAN:
Q Yeah. Okay. All right. But so you have confidence about the wall, even though the authors of this study we're discussing did not have confidence as to --
A They were talking about --
Q -- what its impact would be.
A -- the representativenss of a monitor. I'm talking about practical modeling. If you looked at a, people do not model walls in doing dispersion modeling in this context.
Q On page 4-1, the first, I'm sorry, yeah, the third paragraph --
A Of which document?
Q Of the Exhibit 342.
A Okay.



Q So it says, they have, they say a consideration to make here is that as gasoline and diesel engines become increasingly advanced, NOX emissions are decreasing, so future decreases in max may come after a significant reduction of fleet emissions of NO2 have already been achieved. A caveat to this is that recent studies have found that although NOX from newer diesel vehicles is decreasing, the relative fraction of direct NO2 emissions from these newer vehicles can be considerably higher than for traditional fuels and engine configurations. Given these considerations, care should be exercised when making future predictions of near road NO2 concentrations for individual road segments using current fleet models. Did you take such care and consideration of the, some of the vagaries of so-called fleet models?
A Yeah, there's a reference I reviewed in my set about that, where they noticed that the ratio of NO2 to NOX went up, and the conclusion was there was more diesel vehicles, light duty diesel vehicles added to the fleet mix. But for Costco, they don't service diesels, so it really wasn't an issue.
Q But there are diesels in the area, are there not?
A Right, but we're talking really about a gas station that sells gasoline only. So the gas queue is not an issue, and the loading dock is primarily clean diesel.

Q And the, but exactly, the loading dock primarily clean diesel. There's a suggestion here, if I understood it, maybe you understood it differently, is that the clean diesel would, although it has many benefits, may have a drawback, which is that more of the NOX was converted to NO2. Do you agree with that, or did you consider that?

A No, that's not, I think it's, that's not really what I think it's saying. It's saying that is you change your fleet mix and have more diesel vehicles, and there's someplace in Europe that that's happening more than here, that as you add more diesel vehicles to the mix, especially passenger vehicles, that your ratios can change. I recall reading that.

Q Well, this, they tested a repeat upward or deciding words, the caveat is that recent studies have found that although NOX from newer diesel vehicles is decreasing, the relative fraction of direct NO2 emissions from these newer vehicles can be considerably higher than for traditional fuels and engine configurations.

A So the idea is that they produce much less particulate matter, but maybe a higher fraction of NO2 from NOX.

Q Yes. So you agree with that, disagree with it? Are you aware of it?

A I was aware of that. The ratios can change. The



literature right now is showing ratios that are quite a bit less than the 25 percent that I used here. Most of the ratios are in the range of five to 10 percent from tunnel studies and near roadway studies. If you can isolate away from the ambient, the background component, which is difficult to do if it's in a tunnel.

Q Page 3-9, the last paragraph, do you agree with this? Models of NOX emissions from vehicles reach a minimum at approximately 40 miles per hour, and increase as the vehicle speeds either decreases or increases, forming a U shape. Do you agree with that?

A I don't have any reason to disagree with it. I did not realize that above 40 miles an hour you get a drop, but we're not modeling anything above 30 miles an hour in this particular study.

Q And again, not to beat a dead horse here, the highway that they were measuring, monitoring in Las Vegas, they found, this is unbelievable, I'm going to move there, during the study period the speeds at Las Vegas were never less than 45 miles per hour. So that Las Vegas might be very relevant to a queued line, would it?

A Well, we could flip that, though. I mean you've been to L.A., right? L.A., all their, pretty much all their highways are jammed a lot of the time, especially I-710. So the numbers they were measuring would have had a fair amount



of congestion, probably much less than 10 miles an hour.

Q But we're just, so we're going to ignore the Las Vegas section. That's really not relevant. Which has the lower measurements.

A I don't agree it's not relevant at all. What I'm saying is I agree it's only a few locations. I think that I-710 is an important one. But we can look across the whole country, or we can look across the entire state of California. And you know, California reported 100, 103 stations reported there for 2013. And the highest one there was 145 micrograms across the entire state. So I think that you know, for broader context, again the odds of a violation occurring at this ring road are extremely remote.

Q So but all the measurements you're citing, or I won't say all, because it's maybe not all, but the majority of the references you're citing, the sites you're citing, were developed before the standard was changed and before the EPA started changing the rules about where to put monitors, right?

A Well, they are going to put them near major highways, but there's no major highway at the ring, where the ring road is.

Q So you have a hypothesis that the air pollution, the NO2 and other air pollution from the, let's say the beltway, are always going to be worse than from a congested



parking lot or gas station. That's your hypothesis.

A I made a statement relative to the Costco Wheaton facility, that it'd be hard pressed for an analyst to look at I-710 or the rest of the country, and draw the conclusion that for some reason the ring road and this gas station is going to be the greatest source in the United States by about 40 micrograms per cubic meter to hit the standard.

Q Well, it will exceed what questionable monitors have shown in other parts of the United States. That's not necessarily saying it's the worst source in the United States. Maybe the worst source in the United States has not been measured. Is that possible?

A Well, Mr. Silverman, there's in 2013 there's 822 sites the EPA is reporting as of today.

Q Right.

A And the highest is 156. And they may have some clunkers in there, but not 822.

Q Well, the majority. I mean why would EPA be unable to classify the air quality if they have confidence in those 822 monitors?

A I'm not going to read it, but the document you have, it tells you why. It's shown, I'll just cite the page number, 12056 --

Q Right.

A -- explains why it's classified the way it is.

MR. GROSSMAN: What's the exhibit number on that?
THE WITNESS: I don't know. Air quality designations for the 2010 primary NO2 standard. The rule, it's the February 17th, 2012 Federal Register.
MR. GROSSMAN: Oh, the one he just referenced?
THE WITNESS: Right.
MR. GROSSMAN: Is that the same?
MR. SILVERMAN: Yeah, February 17th.
MR. GROSSMAN: Well, that's Exhibit 571.
MR. SILVERMAN: Yeah.
MR. GROSSMAN: And what were you reading from there?
THE WITNESS: You want me to read it?
MR. GROSSMAN: Yeah, but I wanted to get what section it was.
THE WITNESS: Oh, it's in section number six. The end of section six --
MR. GROSSMAN: All right.
THE WITNESS: -- the last full sentence.
MR. GROSSMAN: Hold on. That's not what the, the last sentence in what I have for section six says --
THE WITNESS: Do you have a page 12056? Either yours aren't numbered the same --
MR. GROSSMAN: No, what's --
THE WITNESS: The last section, yeah, it's the



last part of section six. Should I read it, the sentence?
MR. GROSSMAN: Well, I just want to make sure, I want to find the sentence in here. So if it's the last sentence in section six, it doesn't say what you're saying.
THE WITNESS: Okay. It talks about designations and boundaries. Section six, what guidance did the EPA issue and how did the EPA apply the statutory requirements, applicable guidance for determining area, designations and boundaries.
MR. GROSSMAN: Right. I have that heading.
THE WITNESS: And then the last sentence of it gets into the issue about unclassifiable attainment.
MR. GROSSMAN: Yes, the last, yes, okay, so go ahead and read that.
THE WITNESS: The EPA uses this designation practice, which is referring to unclassifiable slash attainment, for initial designations to mean that available information does not indicate that the air quality in these areas exceeds the 2010 NO2 national ambient air quality standards.
MR. GROSSMAN: No, I was actually, yeah, you read that. I understand that. But I, you had mentioned the site, that there were, there were 882 sites in the U.S., and highest is 156.
THE WITNESS: That comes from the EPA AIRDATA, all



one word, A-I-R-D-A-T-A, data base.
MR. GROSSMAN: And is that in the record? No?
MS. CORDRY: No, that's something that's on-line and you can query it for, which we've both been querying a different kind. Some of those print-outs that I did, and that Mr. Sullivan has put in, come from querying that on-line data base.
MR. GROSSMAN: Well, I guess we should have that, since you've referenced it a number of times.
MR. GOECKE: We can provide that.
THE WITNESS: We can provide it.
MR. GROSSMAN: All right.
UNIDENTIFIED SPEAKER: Are we allowed to have on-line data bases?
MR. GROSSMAN: Yes, I've allowed on-line, that are verifiable, and exchanged, and the information is exchanged. I've questioned whether you can put in on-line things that are subject to being changed, like somebody's writing in their opinion on something and that kind of thing. So it depends on its verifiability and so on.
BY MR. SILVERMAN:
Q Let me ask you a question about the urban and rural. Suppose Mr. Agliata and Westfield suddenly see the light and decide to plant trees all around the parking lot. Would that change the calculation of urban and rural?



A It would not.
Q And the area that was the original area for the first gas station proposal, that's grassy now. If that was, if that remained grassy, would that change the urban/rural?
A For the whole model, no. But I was mentioning was that was going to be not grassy in the future.
MR. GROSSMAN: I think that's the evidence here, is that that's not going to be grassy, that's going to be --
MR. SILVERMAN: But I mean are we frozen here in time as to how much greenery gets into the mall?
MR. GROSSMAN: No, I mean we evaluate the site as it is proposed to be, and then my understanding that the site and that surrounding parking lot would be a parking lot once, you know, if this is approved.
BY MR. SILVERMAN:
Q And there were some, also some stormwater elements to handle the stormwater from the gas station, which are green. And would these affect the urban/rural?
A No, Mr. Silverman, the parking lot is a hot source relative to the rest of the environment. We measured that on several nights. I've put that on the record. It's urban. It has heat. It's going to not get the stable nighttime conditions that a rural area would get. I think we have agreement that it's an urban source, between the two meteorologists involved. So you could add a storm drain

here or a tree there. It's not going to change the fact it's a big mall with a parking lot and a ring road and a gas station queue. That's what it is. It's an urban kind of a warm surface that's going to produce mixing, unlike a rural designation would.

Q All right, well, don't people plant trees and vegetation to mitigate urban hot spots? Isn't that something that people do sometimes?

A Well, sometimes they have a park in the middle of a city, which will create a cool spot. And so that, it will, at night it will flow from the cool spot to the rest of the area and cool it down. But here it's the opposite. We have a hot spot and the air's going to flow into the mall, and when it does it's going to cross a hot, well-mixing, urban-type dispersion condition.

Q Okay. So you're, no matter how much Westfield decides to green up this mall, it's not going to change your calculation at all in the future.

A Well, that's an extreme. If they were to tear out the parking lot and put in trees, make a little forest in there, that'd be a different situation. But putting a tree here and there is not going to change the overall dynamics.

Q You said, you described, today you described your analysis in your rebuttal report as extremely conservative, so what about your prior reports? Were they, would you use



the same adverb, that they are extremely conservative? Or would use another adverb?

A I'd say they were very conservative.

Q They're very conservative.

A Extreme is, I don't know where you draw the line between very and extreme, but I have no doubt in my mind that the modeling of each of these reports is overstating the actual impact.

Q I'm sure you have no doubt in your mind. But I'm trying to get the words. We started out the year 2012 reports as being, well, they were extremely conservative too, right?

A I don't recall the --

MR. GROSSMAN: Well, what difference does it make how we characterize them? He's called them conservative. He says this current one is conservative. Whether you call that first one ultra-conservative or whatever, certain products are described only as large, enormous and gigantic enormous, you know?

MR. SILVERMAN: Well, I mean I guess the point is that each of your iterations is a little bit less conservative than the one before, so I don't know what the first one would be called. I guess it would be called ridiculously conservative.

MS. ADELMAN: Tea Party conservative.



MR. GROSSMAN: I'll make the jokes.

MR. SILVERMAN: Okay. Thank you.

BY MR. SILVERMAN:

Q Okay, the, oh yeah, background. We were talking about margins of error in your modeling. You distinguish between taking a 50 percent margin of error for the modeling, and you said well, the background is different because that's a fixed number. And so we don't take the 50 percent for the margin of error, if that's the right term, for the background. We just do it for the modeling. I think you and Mr. Grossman had that conversation.

A We did. I mean actually when I said it was plus or minus 50 percent, I was close. But the EPA actually says plus or minus 10 to 40 percent in the appendix W.

Q But that's for the modeling. Now is there any margin of error in the background?

A I think the margin of error refers to the modeling analysis, which is of the part you're modeling. First of all EPA, I have quotes from appendix W, that clarifies this issue. EPA recommends that you do not modify the modeling beyond a bright line. And they make it clear that, and I could put it into evidence if you'd like, that they don't recommend doing that. They provide it for perspective for decision-makers, but they don't recommend scaling things up to make decisions.



MR. GROSSMAN: Right, but I mean that may be one of those differences here that, not mentioned by the opposition, but where there's an advantage to the process here in that we can consider those potential errors or they potential for uncertainty, whereas apparently the EPA does not. So all these methods have their different benefits or deficits.

THE WITNESS: Mm-hmm.

BY MR. SILVERMAN:

Q So the question I have is how confident are you that the measured background at the particular site in Arlington or wherever it is, you pick it, actually reflects what you breathe when you walk down the Wheaton mall?

A Well, if you ask me does it hit it every day at every location, I'd say no, it can't do that. But over the course of a year or multiple years, is it providing representative data on the distribution? I'll say yes, and probably conservatively so.

MR. GROSSMAN: But I think that Mr. Silverman's question is a good one. That is, when we discussed it the other day, you corrected my assumption that the 50 percent would apply to the whole amount, and said no, it would only, the 50 percent error potential only applied to modeled amount and not to the background. Is there an uncertainty factor for the monitored locations that you can apply in the

same ways you could apply a 50 percent plus or minus for the modeled?
THE WITNESS: Are you referring to the monitor, plus or minus a tolerance range --
MR. GROSSMAN: Yes.
THE WITNESS: -- for accuracy? They, each one does have its own reported value, plus or minus a certain tolerance value. It's usually contained in the existing protocol of what the target data quality objectives are. And they'll define it, and these instruments do have defined uncertainty ranges.
MR. GROSSMAN: But I'm actually talking about once you have the statistical information, that is, you've got the read-outs over a longer period of time, is there an uncertainty level to that average read-out level that you are relying on in your, to plug into your model?
THE WITNESS: Are you referring to how it was represented at a specific location?
MR. GROSSMAN: Right. I mean you have a, you get some results from the, let's say the two monitors in Beltsville and you average them together, and they cover a certain period of time. And let's say the level is 50. Is there a plus or minus two or five or 10 to that 50, that you could attach in evaluating the potential uncertainty to the monitored amount?



THE WITNESS: It's easier to do it for the actual instrument accuracy --
MR. GROSSMAN: Right.
THE WITNESS: -- which is why I was, tended to try to be conservative. So for example for PM2.5, you know, we'd hit the higher of Rockville versus Beltsville. Does that, could you argue could it be possibly higher? Well, I suppose you could argue that, but the issue is we are, we continue to show a downward trend. The question is by the time they actually build this gas station will the trend be, will the numbers be lower, and the odds are they will be. And so in that context the values we use now are probably going to overstate to some degree, but I don't usually see people with error values on those. I've never actually ever seen that.
MR. GROSSMAN: Okay. But see my, that doesn't exactly answer my question. I'm not saying what you're saying is illogical. I'm just saying in trying to analyze this, and analyze what is the margin for error in your predictions, you supplied me with a figure of 50 percent for the modeled amount, but you didn't supply me with a figure in terms of margin of error for the monitored amount. And I'm asking you is there some accepted figure when you have two years or three years of monitor results for a margin of error for that.



THE WITNESS: Like I said, I've never seen that shown or used. And that's certainly a logical question to ask, but I've never seen that quantified.
MR. GROSSMAN: Okay. Do you have an expert opinion on that?
THE WITNESS: I think that, you know, what we're doing here is we're modeling all the major roadways that are going to have a significance effect on this location. So in that sense we're covering the nearby, you know, most significance sources anyway.
If you take a location like the Arlington monitor, which you know, is in a pretty congested area too, and you would add that, and there's roads going near that too that we, that have not been, that are contributing to that --
MR. GROSSMAN: Right.
THE WITNESS: -- location. I think in that kind of context it is conservative. If we didn't model the nearby roadways, it may be a different story, but we did. And so my expectation is that factor, coupled with the fact the trend is dropping, for the gas stations built in 2014 and '15 that trend should likely be less than it is now, which would give you some buffer. How much and how to quantify that, you know, the trend line could be used to give some indication of a drop in that sense. But you're asking about the other way, too.



MR. GROSSMAN: The other end, too, yes.
THE WITNESS: The other way, too, is a little bit difficult to quantify.
MR. GROSSMAN: All right.
BY MR. SILVERMAN:
Q And you don't, do you agree with the CRC report that's saying that near roadway measurements could be 30 to 100 percent higher than on the more distant monitors? Would you agree with that?
A I would say based upon looking at the data they collected there, versus the data I've seen for other parts of the country and more typical sites, it seems right. Near a highly traveled busy roadway, concentrations should be substantially higher than places removed.
Q And you do acknowledge that the monitoring network that gives us the backgrounds is undergoing a thoroughgoing change.
A Free zone NO2?
Q Yes.
A Well, they said in 2013, and we've already talked about the near roadway, again my position on that is that there are no highways here, that that's not the issue. So I don't see that impacting this site in any way.
Q So your hypothesis is that, again I think I'd asked you this before, just I'm not sure I got an answer, is

that a congested parking lot will never be as bad as a busy highway.
A I don't like to use the word never.
Q Uh-huh.
A But if you're asking like 98th percentile kind of a distributional sense, I can't imagine a mall parking lot having the same degree of congestion as I-95, I-395 at rush hour when you have an accident, which happens unfortunately too often, that blocks traffic for long periods of time. It's in the data sets. That's not going to, I can't envision that happening in a mall.
Q You can't envision queues and lines and idling cars in the mall?
A Well, I didn't say I couldn't envision idling cars in the mall, but I can't, I have never been to a mall when there's long lines of cars like I-395 would have, you know, stalled there for long periods of time. I mean I haven't seen that at a mall.
Q Okay. So in your report, you have a conclusion in your latest report that --
MR. GROSSMAN: The rebuttal report.
MR. SILVERMAN: The rebuttal report.
MR. GROSSMAN: Okay.
BY MR. SILVERMAN:
Q Yes, here it is, on page 10, it looks like. Oh,



yeah, it's on page 20. Conclusion, it is Mr. Sullivan's expert opinion, with a reasonable degree of scientific certainty, that the proposed Costco gas station will not violate any applicable federal or state UV air qualities. So a reasonable degree of scientific certainty. What do you mean by that?
A More likely than not.
Q More likely than not. And did you have that same reasonable degree of scientific certainty when you did your August report?
A I did.
Q You did. It's the same.
A I have, I mean I've looked at this gas station for four years I've been doing these reports. I have not had concerns that, based on any analysis I've done, that the station will violate any standards.
Q So your level of certainty hasn't changed.
A I won't say that I, I may be more confident now than I was, from doing all this additional analysis. I don't know how to answer that question, but I stand by the statement you just read.
Q And do you have, there's been a lot of talk about error bars. I notice the CRC report has a lot of error bars. You don't seem to use those. Is there a reason you don't estimate the amount of error?



A I don't recall error bars this year and I should have mentioned to you in the --
Q I just draw your attention to it, maybe I don't understand what an error bar is, but I thought I did. Here, for example, on page 310 --
A They're showing a distribution there, as I read that, with each of the ends they're showing the max and the mins, and it's showing, I'd have to read this in more detail, but the percentile, probably 25th percentile, 50th, and 75th percentile. It's showing ranges of measured values.
Q Those rectangles are not error bars, that's not a proper phrase?
A I said I'd have to read the report in greater detail, but those kind of plots generally what we use to present quartiles of measured data.
Q Yeah, how about page C-11?
MR. GROSSMAN: C-11?
MR. SILVERMAN: Yes.
THE WITNESS: I don't have a C-11.
MR. SILVERMAN: I'm sorry, it's 311. I'm sorry.
THE WITNESS: To me, though, I mean again we could look at the, maybe there's some greater detail, but I don't read that as suggesting error bars but rather presenting the data showing the extremes going from, in this case it looks



like zero up to, for example on 311, figure 3-8, they're showing some stars and outliers maybe at 82 ppb and 75 ppb. We'd have to read closer to what each of these boxes implies. But again, usually it's described as showing quartiles in extremes of data.
BY MR. SILVERMAN:
Q Extremes of data. That could be a high and there could be a low.
A Well, there are high, we measured data sets for two years. You're going to get highs and you're going to have lows.
Q So you don't regard this as a discussion of error.
A Well, I've answered the question, Mr. Silverman. I'd have to read this in greater detail. As I said, it didn't seem to be that. It seems to be showing, it's labeled as trends, 3-3 temporal trends. I could see, but it looks to me like it's measured data.
MR. GOECKE: And Mr. Grossman, I object. I mean his premise is flawed. This is actual data. This isn't a modeling report.
MR. GROSSMAN: I understand. And I think the witness answered that.
BY MR. SILVERMAN:
Q In the CRC report, and in many reports, it's not unusual to see scientists say well, some caveats are, some

things you have to worry about, some things we're not sure of. We get areas of doubt, areas of further investigation. Have you ever seen that kind of language in scientific reports?

A In research?

Q Yeah.

A I've certainly seen and done that. And in certain modeling that's based upon a different criteria than here, yes, I've seen that done. Have I seen it done for air quality modeling of this nature? No, I have not.

Appendix W says for the present, continued use of the best estimate is acceptable and is consistent with the generic Clean Air Act requirements. That's what the State and the EPA wants to see. That's what they're provided with.

Q Why would the State and EPA make one method a default method, and another method requiring lots of supervision? I mean what were their concerns?

A Well, that's a different issue. I mean the issue, what I'm referring to, yes, you meet with the agency, you agree upon a protocol. You implement the protocol. They see if you did it right. If you did, if you're a tenth over you failed. If you're a tenth under, you passed. That's how the system is workable. Otherwise it'd be very difficult to have any kind of national or state program that



was, every application was done differently.

Q And during those discussions do they not question you about the areas of uncertainty and the viability of your, the reliability of your sources of information?

A I've never been questioned about uncertainty ranges in emissions, or things of that nature. They certainly do question in those discussions about methodology, and yes, sometimes discussion about how various treatments would be done. But once you finish that protocol stage, you do the model and they check it. That's done. Then you see if you passed or failed.

MR. GROSSMAN: Do you think there's been a certain amount of questioning here?

MR. SILVERMAN: A certain amount. There has certainly been, yes. I just want, just to highlight the point, I think in --

MR. GROSSMAN: You've highlighted the point over and over.

MR. SILVERMAN: No, I just, there's a quotation from the, Mr. Fox's memos, the fact that the more you strike from the default values, the less confidence one should have in the result.

THE WITNESS: Can you read that quote to me, Mr. Silverman? I don't know if that's in there or not.

DR. COLE: No, I'll do it.



MR. SILVERMAN: We'll let Dr. Cole speak to that. I think, I think I am done.

MR. GROSSMAN: All right.

MR. SILVERMAN: Did I do what I said?

MR. GROSSMAN: You did. Well, not exactly 10 minutes, but you were pretty good.

MR. SILVERMAN: Eleven.

UNIDENTIFIED SPEAKER: More than 10 minutes.

UNIDENTIFIED SPEAKER: It was an uncertainty thing.

MR. GROSSMAN: Right. Mr. Goecke, is there any redirect?

MR. GOECKE: There is some limited redirect.

MR. GROSSMAN: There's no requirement for redirect.

MR. GOECKE: I understand. I understand. We'll be quick.

REDIRECT EXAMINATION

BY MR. GOECKE:

Q Mr. Sullivan, leaving, picking up where Mr. Silverman left off, the uncertainty that he's been focusing on, talk about this process in terms of how it addresses any uncertainty or potential uncertainty.

A Well, inherently the way the Clean Air Act has been developed, it's developed with the intent and stated



expressed requirement to have a margin of safety incorporated into the standards themselves. That's how they developed. And so that's one safety margin, and as I've mentioned for many, many hours, there are, there's many number of steps in this model that are conservative. And I'll use NO2 as an example. The modeling 120 to 150, 160, I expect they will come in around, so if you were, we were to monitor it, I'm not suggesting we do, 75 to 100 would be the max I'd ever expect to see. That's conservatism. I'm suggesting, that example, probably a factor of approximately two.

So the issue is there is safety margin. There is consideration of uncertainty with those two steps alone, such that there really isn't a need to apply another margin of safety in terms of a plus or minus 10 to 40 percent uncertainty range. That's more than compensated by the other uncertainty that's already in the analysis.

MR. GROSSMAN: Excuse me a second. Mr. Brann, you didn't let Ms. Harris near the thermostat, did you?

MR. BRANN: I did not.

MR. GROSSMAN: Can you check it to see whether --

MR. BRANN: I've been watching.

UNIDENTIFIED SPEAKER: It says 73.

MR. GROSSMAN: See that? It's snuck up again.

THE WITNESS: For folks following the one-hour NO2

saga nationally, there's a lot of angst about that topic because, you know, power plants --

MR. GROSSMAN: It's about to go on, by the way.

UNIDENTIFIED SPEAKER: Okay.

THE WITNESS: -- power plants in various sources are doing the modeling, and they're getting numbers that are way above what's going to be measured, and that's why Mr. Fox has issued two memos, the one you're referred to, plus in the following year trying to provide guidance. The industry is not happy with that, because it's still over-predicting.

So there's, it's too high to start with, by a lot. If you applied a 40 percent safety factor onto, say, a 150 value, you'd get 210. You could get over the standard mathematically if you wanted to, but that wouldn't be real. If you compare it to what's going on, as I've mentioned too many times, the highest in the country, last year it was 156 micrograms per cubic meter. So you take yourself out of the range of realism into hypothetical that you, really is not going to, would not occur. There's no reason to expect that it would occur.

MR. GROSSMAN: Okay.

THE WITNESS: We have put a lot of, the remaining conservatism I've already stated. I can summarize it.

MR. GROSSMAN: No, I think you've testified at



length. I don't think you have to go over it again.

THE WITNESS: All right.

BY MR. GOECKE:

Q The 10 to 40 percent range that you mentioned today, do you have a citation for that, or where can we find that?

A That's in the appendix W, and section, it's the uncertainty section in appendix W, which let me see what I've got here. The actual quote that appears in the --

UNIDENTIFIED SPEAKER: Let's get this blown up so we can read it.

MR. GROSSMAN: Page reference?

THE WITNESS: It's, I don't, unfortunately.

MR. GROSSMAN: All right, then a section reference.

THE WITNESS: It depends which version you're looking at, but it's either 9.1 or 10.1, I believe it is, the uncertainty description.

MR. GROSSMAN: Okay.

THE WITNESS: And I can provide the quote, which would allow anyone to find it electronically.

MR. GROSSMAN: Let me look up 9.1 first.

MS. ROSENFELD: If I could just ask for clarification, you said either 9.1 or 10.1?

THE WITNESS: It changed. There's different



multiple versions of this out there. My notes here say 10.1, but it's 9.1. The most recent one is 9.1. So section 9.1, uncertainty I believe is the title to it.

MR. GROSSMAN: Okay.

THE WITNESS: And what it says is that models are more reliable for estimating longer time-averaged concentrations than for estimating short-terms concentrations at specific locations, and two, the models are reasonably reliable in estimating the magnitude of the highest concentrations occurring sometime, somewhere within an area.

For example, areas in highest estimated concentrations of plus or minus 10 to 40 percent are found to be typical. That is certainly well within the often quoted factor of two accuracy that has long, let me find this here, has long been recognized for these models. However, estimates of concentration that occur at a specific time and site are poorly correlated with actual observed concentrations and are much less reliable.

For this analysis we aren't doing any estimates of modeling in space and time, and showing that as the end point of the modeling. We're showing in a distributional sense, for example, for the highest 98th percentile, that you'd expect to see a certain concentration at some place near the gas queue, and on some day. We're not saying which



day and which spot. That from EPA perspective, you hit the distribution and general location within 10 to 40 percent.

So I mean that's how EPA views this. But in my experience where I've done model performance testing for EPA, I've found numbers similar to this. So I believe this is a reasonable estimate of what you'd expect to see in a real world situation. But if you wanted, if the requirement was I have to model NO2 and the northwest corner of the gas queue on July 3rd, you know, 2014, or in the past, 2013, it would be off. But that's not how the standard is written. The standard is for any location in that general area, and for a distributional sense for pollutants such as NO2 one hour.

BY MR. GOECKE:

Q Are there things that a modeler might do that would result in models predicting concentrations that are 10 to 40 percent lower than what actually would result?

A My experience is usually there's conservatism remaining in modeling. That is generally the goal. Could you pick a location that's further, in a more rural area that would give you a lower number? That could happen. I'm not recommending that.

But there, you know, if you follow the guidance and it usually allows some residual conservatism, I would expect you'd be, have a greater likelihood of being higher,

over-predicting rather than under-predicting.
Q And in your opinion is that true for the modeling you've done for the proposed Costco gas station?
A Oh, it is true, in my opinion.
Q And I believe you testified earlier that EPA's recommended application is the best estimate approach. Do you have a citation for that?
A It's in the same section, and I read that off a little bit earlier. There's more information on that in the same, section 9.1 document. I could read it into the record if you want. It's about a paragraph long.
Q If you have that handy, that'd be great.
A Looking at, I believe it's section 9.2, recommendations. No specific guidance on the consideration of model uncertainty and decision-making is being given at this time. There is incomplete technical information on measures of a model uncertainty that are most relevant to the decision-maker. It is not clear how a decision-maker could use such information, particularly given the limitations of the Clean Air Act.
As procedures for considering uncertainty develop and become implementable, this guidance will be changed and expanded. For the present, continued use of the best estimate, which I've called the bright line, is acceptable and is consistent with the Clean Air Act requirements.



Q Thanks. Going back to Mr. Grossman's question a moment ago about the variability or the uncertainty with background levels, actual measured levels, does the 98th percentile application modeling, is that intended to address any uncertainty or variability with those measured levels?
A Well, it's intended to of course come up with a very high-end near-tail distribution to be conservative. It doesn't use the highest, because I think we all can agree that model bias will occur from time to time, and outliers will occur. That's why they go to the 98th percentile.
But by going to the 98th percentile you tend to overstate, plus you know, I suppose one way I could answer Mr. Grossman's question, if we wanted to go more conservative on background for NO2 one hour, for example, we used a paired background in this analysis, stage two and stage three, hour by hour match with Arlington. If we were to say no, we'll be more conservative --
Q You know, the term has been used a number of times, paired background. Perhaps you should state for the record exactly what that is.
A Concurrent background, where it's using an hour, matched hour by hour basis, it'll pull the corresponding NO2 concentration from Arlington to match up with the meteorological data set you're modeling.
Q Okay.



A So if we use stage two as an example, if we went to the very conservative approach of using the 98th percentile from Arlington, and we assume that that happens all the time, every hour for three years or five years, for stage three for three years, that would be conservative, because many, most of the time it's going to be a lot less than that. We'll get a third of that or less.
If we did that in stage three, we would be, the background as I showed in the culpability was 73 micrograms. The 98th percentile Arlington background value for 2013 as an example was 83, 10 micrograms higher.
So to address your question, maybe this would cover it. If we added 10 micrograms to the 121, that would show a more, a very conservative way to address background using that site. And perhaps the range would be 121 to 131. If we went to stage two with a similar argument, it would be something on the order of 10 micrograms higher instead of 150 whatever it was, 156 to 166. So there are ways of doing that in a more conservative way. But from what EPA is suggesting here, and you aren't bound by that, there really, it's hard to know what to do with that data.
Q Okay. Thank you. I'd like to turn now to Ms. Cordry's questioning about her conversation with David Krask at MDE. She made some statements about things he had told her. Have you had a chance to speak with Mr. Krask since



you testified last week?
A I spoke to Mr. Krask this morning.
Q And can you tell us whether or not Ms. Cordry's description of what he told her, did he give you the same responses?
A Similar. He had additional context that I think would be helpful.
Q And just to put it in context, we were talking about the different monitors used at the Beltsville location, correct?
A Correct. There's three monitors. We discussed the three of them.
Q And tell us again what the difference is with one of them.
A Site number one at Beltsville is the primary. It's the federal reference method, the gold standard monitor. Site number two is the duplicate for that site, for fed reference method, that he confirmed every 12th day it's used for duplication purposes. Site three is the BAM that we talked about before. He and I both agreed that the BAM has positive bias relative to the federal reference method.
I confirmed with him that many states will, if they have co-located monitors, a federal reference monitor and a BAM or a TM, that they'll only rely upon the federal

reference method. He said in Maryland his director prefers to be conservative, and at this point they're in attainment. And what they do is very much like Ms. Cordry said is they will take, on days when they have a reading in the federal reference method, it'll use it. On days they don't, which is two thirds of the time, they'll fill with the BAM. They recognize it's high. It's about 30 percent higher than the others. But it's a conservative way to address the issue.

Now the proper way that they use it is they will take and they will, from their point of view they will weight the BAM two thirds weighting, and they'll weight the federal reference method one third weighting. And for example if you did that with that data set, I'm using 2011 as an example, the site one, the federal reference method, had an average of 8.7 micrograms per cubic meter for PM2.5. Site number three had an average of 11.6, quite a bit higher. If you assume two thirds 11.6, one third 8.7, you'd have it 10.6. So it would go up to 10.6. We used a 9.8 in our analysis. You could use a 10.6 if you chose to. We're only contributing .9 micrograms. Again, the standard.

But he clarified a very important point, and the point that he clarified, which I had heard before, is that the standard itself is based upon the federal reference method. So the actual 12 micrograms is tied to that method. The health studies that they relied upon were based upon



those readings. So that you know, if the BAM is reading higher, it's inconsistent with the health records that were the basis for the standard. It's conservative treatment.

And what some areas will do if they're going to bump up against the standard, then a decision will be made are you going to continue using that BAM or not. The EPA gives the states discretion. They can use it or not use it. Most states don't. In the case of Maryland they're being conservative. When they hit the standard, if they do, they will have to reassess it at that point in time. He didn't say what they would do, and I'm not going to put, you know, put out any suggestions that I know what they would do. But that was kind of the description he gave to me.

For these purposes here, we know, for my purposes, we know it's biased. It's high. It's much higher than the, the BAM is much higher than the gold standard. And from my point of view, I chose not to use it. I still stand by that decision. I'm not criticizing the State. They have a different objective. But my goal was to be accurate. And if I'm using a standard that I know is 30 percent biased high relative to the gold standard, I prefer not to use it.

But if I did, it's academic. It's not going to change the attainment status at all. That was pretty much my notes from the discussion.

Q Thank you. And I'm going to hand you a document



called display of bias of federal equipment monitors such as BAMs in comparison to federal reference methods, and summary of EPA position on the use of FEMs. Do you recognize this document?

A I do.

Q And tell us what this document is.

A This is a document from EPA, EPA's web page, and we could use the projector now, if you think that'd be helpful.

Q I've passed out copies of it, so --

A Okay, so everybody has a copy.

Q Yeah.

A The earlier part of this is based upon the web page reference provided near the top of the page in blue. And basically it allows you the opportunity to compare the bias for different sites around the country. We're highlighting Beltsville, the site that's in the discussion here.

And the easiest way to refer to this, if you see there's six boxes on this chart on page one. If you go to the first row and go to the right side, you see a box that shows colored dots that are green, orange, blue, various colors. What that's showing you, it's showing you, well, what the BAM is doing relative to the reference method monitor. And you can see it says, there's a zero line.



Then it shows what's, when the BAM is higher and when it's lower. And maybe out of all these points, out of the 121 points a year shown here, there's a couple of times when the BAM was actually lower. But in nearly every case, the BAM is higher, and by quite a lot. And it's across all four seasons.

If you now go down two rows and go to the far left, you can then see how things compare there. The FRM is again the gold standard. The continuous is the BAM, so that's in the third and fourth column on the table that's in the bottom left portion of page one.

As you can see consistently through each season, for all data for this example here was 8.8 versus 11.6. But you see that bias occurring each time. As a monitoring person, which I do a lot of, I don't like to use data that has bias built into it. I can see why the State does, for their purposes, but for modeling analysis like this, I see no reason to use a monitor that I realize has substantial bias.

MR. GROSSMAN: Let's call this two-page print-out Exhibit 572, and that is display of bias of federal equivalent monitors, fondly known as FEMs, in comparison to reference methods.

(Hearing Exhibit No. 572 was marked for identification.)

MR. GROSSMAN: What does BAM stand for again?
MR. GOECKE: You know, I don't recall what the initials stand for. There's -- BAMs, and I don't remember the designation of either one, but Beta, I mean I just --
MS. CORDRY: Beta Attenuation Mass Monitor.
UNIDENTIFIED SPEAKER: That sounds correct.
MR. GROSSMAN: BAM is Beta --
MS. CORDRY: Attenuation Mass Monitor.
MR. GROSSMAN: -- Attenuation Mass Monitor you said?
MS. CORDRY: Yes.
MR. GROSSMAN: So it's two M's in BAM?
MS. CORDRY: Yes, BAM monitor.
THE WITNESS: It's usually listed as one M, BAM.
MR. GROSSMAN: Okay. And now they have to say it's a bias, because it's compared to the reference point. Why is the reference point more accurate than the BAM?
THE WITNESS: Well, it may not be, but the issue is the standards. All the health scientists were involved. They were using federal reference method data to form their conclusions. So as a matched data set, you'd need to rely upon the same thing.
MR. GROSSMAN: I see. Okay.
UNIDENTIFIED SPEAKER: So that's the logic there.
THE WITNESS: And this first page was the



comparison of 2010 to 2012.
MR. SILVERMAN: I'd object to that. I don't think Mr. Sullivan knows what the health experts, you know, the science, air quality science committee, CASAC, what medical measurement they're looking at when they're looking at the FRM and other things. In fact Dr. Bryce (phonetic sp.) testified about a few measurements. I think he's gone beyond his expertise.
MR. GROSSMAN: Well, I'll let you ask a cross-examination question. I'm not going to prohibit him from saying why he thinks the reference method is used rather than the BAM. All right.
THE WITNESS: The second part is based upon a reference shown at the top of page 2. It shows a figure here, which I'm not going to focus on right now, and then it goes to the conclusions, which I don't know if I need to read into the record --
MR. GROSSMAN: No.
THE WITNESS: -- but it's pretty clear that EPA is saying sometimes these BAMs work, and sometimes they don't work so well, and recognizing there is some bias relative to the federal reference method.
MR. GROSSMAN: All right.
BY MR. GOECKE:
Q Okay. Thank you. And I want to turn your



attention now to Exhibit 565-A. This is one of the monitor values report that Ms. Cordry had asked you about in her cross-examination. If I may approach.
MR. GROSSMAN: Sure.
BY MR. GOECKE:
Q One of the issues that came out during your cross-examination testimony was the frequency with which results were, are published for each of the locations. And can you tell us again what's your understanding of why that might be?
A Yes. In talking to Mr. Krask, I asked him the frequency, the standard frequency. He said it was once every 12 days. So they monitor every three days for the federal reference method primary number one monitor. And then every four times they'll have a duplicate sample. Thirty duplicates a year is sufficient. That's why they have 32 shown here. A duplicate and 121 for the main monitoring site.
Q And Ms. Cordry has pressed the point that we should be using or you should be using locations showing the highest levels that had been measured. Do you recall that?
A Yes, I do.
Q And if you read the highlighted portion --
MR. GROSSMAN: Well, I think she said that that was part of the agreed protocol.



MS. CORDRY: Yes.
MR. GROSSMAN: I think that's what her point was. I don't know if it was or wasn't. I'm just saying I think that was what she was asserting.
MS. CORDRY: Yes, I think I stated that he testified numerous times that he was saying he was using the highest value, and that the protocol in fact specifically agreed to use that particular monitor at Dr. Cole's request, so that's what I said.
MR. GOECKE: So it's not your position that he should have used the highest level.
MS. CORDRY: Well, I am saying I'm going to leave that to Dr. Cole. What I am saying is that when I, the part he was disagreeing with me on background monitor, when you're saying I should have done this or I should have done that, my memo basically said what Dr., I'm sorry, what Mr. Sullivan said he was doing when I was pointing out what he said he was doing versus what he actually did at times.
MR. GROSSMAN: I understand her distinction. It may not be what you recollect. But all right, go ahead, so what's your question?
BY MR. GOECKE:
Q So I'd like to draw everyone's attention to, and I'm sorry I don't have extra copies of this right now, to the bottom of page 565. This language, this caveat language

is in all the monitor reports that you passed out. The third paragraph reads readers are cautioned not to rank order, to rank order geographic areas based on air data reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of air quality for an entire county or urban area. Did I read that correctly?

A You did.

Q And in your expert opinion, what does that mean in terms of taking these numbers and ranking the various monitoring locations in terms of which one has more significance pollution levels?

A Well, I read it to say, as we discussed earlier, you don't take a monitor from the middle of Washington, D.C. or from a monitor in Colburn Road (phonetic sp.) in Alexandria that is a commercial type location, and apply that to a location that is very different. You should be picking representative locations. That's how I read it.

Q And in the paragraph above that, if you would just read that to yourself, or you could read it out loud, actually.

A Air data reports are produced from a direct query of the AQS data marks. The data represent the best and most recent information available to EPA from state agencies. However, some states may be absent, some values may be



absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS data base is updated daily by state, local, and tribal organizations, who own and submit the data. Please contact the appropriate air quality monitoring agency to report any data problems.

Q So in your opinion, does that provide an explanation for why there might be less frequent monitor reports from each location?

A Well, no, I think that the logic was you don't need to have coverage, one to one coverage for defining method precision. I mean the duplicates define precision, how well, how precise are the measurements. If you have 30 measurements per year for precision, that's plenty. And that's why it's, they don't need a complete data set for that, and that's why they don't have it.

Q Okay.

A But the point I was, I think you mentioned before, if I remember correctly, we were not using the highest monitoring site, and we never indicated we would use the highest among the three Beltsville sites. We did average them in 2012, and we stopped doing that because of the bias after that point in time. But Mr. Krask did clearly indicate that it would not be appropriate to use the BAM site exclusively as a basis for a background location.



Q Thank you. Turning now to your rebuttal report, Exhibit 466, do you have a copy of that in front of you? And if you would flip to figure two on page 12, there's been a lot of focus from the opposition about the traffic levels at the site, and one of their contentions is that the traffic that Mr. Guckert projects is actually 15 percent lower that what they think it will be.

MR. GROSSMAN: Well, 15 percent --

MR. GOECKE: Fifteen percent.

MR. GROSSMAN: -- lower than their observations --

MR. GOECKE: Than Mr. Guckert's, their observations --

MR. GROSSMAN: -- from Dr. Adelman and Mrs. Adelman.

MR. GOECKE: Thank you. Right. And it's my understanding that they've, they're extrapolating that to be representative of more --

MR. GROSSMAN: As everybody is extrapolating their observations, yes.

MR. GOECKE: No, no, that's fine.

BY MR. GOECKE:

Q So my first question to you, Mr. Sullivan, is would a 15 percent increase in traffic correlate with a 15 percent increase with model concentrations of pollutants?

A No, it would not.



Q Okay. And why not?

A Well, you have to look at the contributions, and what is actually shown in these culpability plots. The actual ring road and other roadways is only a fraction of the contribution, so for example the maximum location near the gas queue is 147. The ring road is 43. The other roads is 17. So it's about 57, it's about 60, it's less than half of the total impact. So if you had a 15 percent change, it would not be a large change in the actual bottom line concentration.

If it was, we could do the math here, let me get my calculator out. If we have, take the ring road and put it at 43 micrograms, and then bring in the roadways at 18, and the parking lot let's say at one, you get 62 micrograms. And you multiply that times .15, it would be 9 micrograms. So you go from 147 to 156.

MS. CORDRY: Actually wouldn't it be 165 if you multiply the 1.5 times, or the 1.88 times --

THE WITNESS: These are micrograms.

MS. CORDRY: -- 15 percent?

THE WITNESS: No.

MS. CORDRY: That's right, 47 plus 18.

UNIDENTIFIED SPEAKER: Save your questions for --

UNIDENTIFIED SPEAKER: Yes.

MS. ROSENFELD: He's spoken --

MR. GROSSMAN: You can cross-examine.
THE WITNESS: So my point is, two points. One point, if I did it mathematically, it's nine micrograms more. But let's keep in mind what we're doing. Mr. Guckert's most recent analysis said the peak weekly value traffic numbers are 15 percent higher, and that's occurring on Saturday or Sunday, 11:00 to 12:00 a.m., 11:00 a.m. to 12:00 noon.
Well, the assumption I just made was well, if that peak hour happened all the time, every hour the mall was open, Monday through Sunday, it would go up nine micrograms. But that's not real. I mean it's actually if you put in, if you had accurate numbers for every hour of the week, it would be less than what we have right now, because right now I'm modeling the peak weekday hour all the time.
So you put that together, it's a very small factor. And if it was accurately stated rather than conservative, it would be less than the 147.
MR. GROSSMAN: Okay.
BY MR. GOECKE:
Q And turning now to the OLM analysis that you performed, you stated to testify earlier today that you had actually conducted some OLM analysis inside the area that Ms. Rosenfeld is referring to as the tailpipe box. What were the results of those calculations?



A We did. We did testing of the model, assuming, it's like a discussion. I'm not saying this is real. But assuming for the sake of discussion that any location outside the source, that source area, you would use the OLM method, and we did. And we found if you use straight OLM, doing each source separately, we showed a maximum of 172. If we used the OLM group approach, which for multi sources is more accurate and less conservative, we had a 149.
So the point there is we can talk a lot about conversion and we can talk a lot about the box, but the reality is if we cut to the chase and just take the files we have and just make some very minor changes and we look at it that way, we're way under the standard, either of one of those options, right up to the source itself.
Q Thank you. I have no further questions.
MR. GROSSMAN: All right. Recross?
MS. CORDRY: Can we take about four minutes or so, just to talk and coordinate that with everybody?
MR. GROSSMAN: All right.
(Whereupon, at 4:12 p.m., a brief recess was taken.)
MR. GROSSMAN: The final lap. All right, any recross questions?
MS. CORDRY: Yeah, yes, please. And since these have to do with some of the background pieces that I have



done, we had decided it would be simplest if I just used them rather than try to tell it to Ms. Rosenfeld. All right.

RECROSS EXAMINATION

BY MS. CORDRY:
Q Looking at the same figure 2 in your rebuttal report that you were just talking about --
A Okay.
Q -- and actually we've used this term culpability analysis a lot. I'm not quite sure we've ever really defined it. By that do you mean that, is this a culpability analysis, and can you define for sure what that means, so we have that as I'm going forward?
A Yes, it is a culpability analysis, and it's different than a legal term. Nobody's done anything wrong here.
Q Right.
A It's talking about what sources contribute to the total.
Q Okay. And when you did it before in your November, December, January reports, and I thought I'd found a mistake then, but you explained it before I got the point out that it was a mistake, at that point you had a number of these lines like this, 10 or 12 or 15 lines of different factors that could contribute. And when you did those



charts for the home and the school and the pool, as I understand it in that variation of it you gave the highest one for each one of the different factors. So the total of that didn't necessarily add up to your total modeled at the bottom.
A It was done differently. That did not add up to the bottom.
Q Right.
A That's correct. These totals were done in a common run. They should add. They should add.
Q So this is for this, this is the particular highest spot, for instance the 156.18, that's the highest that you found in this run for stage two?
A Correct. That's the highest near the loading dock, and the 147.4 is the highest associated with the gas queue, gas station operations.
Q Okay. Is this the second highest one, or is this, there may be some more loading dock ones between these two numbers?
A Well, you can see the two, if you look at the iso lines --
Q Mm-hmm.
A -- you can see there's two maximum locations --
Q Right.
A -- with 140, so we're showing the highs in each

one of those two locations.
Q Okay. Okay. And so yeah, and so these do, each one of these add up. These are the, so and the loading dock is the highest of any of these for this stage two.
A For this, and also for these assumptions, that's correct.
Q If you went back and were doing it the way you had done before, it's possible that there might be a ring road number that was higher than 46.95 but never associated with a total that was higher than 156.18, is that --
A That's correct.
Q Okay.
A There'd be some shifting in the culpability.
Q Okay. And the same thing for the roads, all of these. You might have, if you did the same for each one of those, the highest number, it might be different.
A The ratios of each source, the total could change.
Q Okay. And just, you did the example of a 15 percent increase in the road with the gas station queue. If we did the same thing on the other one there with the loading dock, where you have roughly 47 plus 18 plus the parking, that gets you to roughly 65, is that correct?
A I'd have to check. So we have, let's see, we're talking about the ring road, 47; parking .2; other roads, 17.7; equals, yeah, 65.



Q Okay. And if we take 15 percent of that we come out with 10, is that correct?
A Yeah, about 10.
Q Okay. And that, you would say you could add that on to the 156.18?
A Correct.
Q Okay. And if we were still using the 98th percentile number, which was 83 you said for 2012 --
A Mm-hmm.
Q -- as opposed to 68, that's another 14 higher there?
A No, it's actually the, well, since I did it, the most recent NO2 value is 83.
Q Okay.
A Because this trend is going down. It depends how you did the slice on that. But again, when you're, I want to emphasize --
Q Well, just, please, Mr. Sullivan --
A -- when you're adding, when you're talking --
MR. GROSSMAN: Hold on one second. You can't speak both at the same time.
MS. CORDRY: I asked him a mathematical question.
MR. GROSSMAN: Yes. I think that's fair.
MS. CORDRY: And the number --
MR. GROSSMAN: Well, let's limit the answer to the



answer here.
MS. CORDRY: Okay.
MR. GROSSMAN: So but I didn't quite understand --
MS. CORDRY: We agreed it's 83, okay.
MR. GROSSMAN: -- the 86 you referred to for 2012.
MS. CORDRY: I think we said 83.
THE WITNESS: It was 83 for 2013.
BY MS. CORDRY:
Q Okay, so 2012 would be even higher?
A Correct.
Q Okay. But we can even stick with 83, so that's 14 to 15, another 14 to 15 points that you would add on to that 166 that we just mentioned?
A Right.
Q So that's getting you up to 180.
A Well, again, I do want to give a clear answer here. We're adding things together, although there are a bunch of what ifs here. But again, the road emissions that you're adding, we're assuming that that peak Saturday hour from 11:00 to 12:00 happens all the time, and it's not even close to doing that.
Q I understand that.
A So it's a mathematical --
MR. GROSSMAN: We understand that. She's getting to some hypothetical number. We realize the



qualifications --
MS. CORDRY: Right.
MR. GROSSMAN: -- that you placed on it before.
BY MS. CORDRY:
Q And I'm getting the point that yes, even with your revised assumptions in stage two, if you raise the traffic and you put the background level back to what you've been doing before you got to be less conservative, with a 15 percent increase you're already up at 180. And I think we've had discussions before about whether 190 is the immaculate number there or not, but we'll certainly start with that. Is there a culpability analysis on your data disk for figure one?
A No, I don't believe so.
Q And was there one done, is there one like that back in August? Would he be able to find anything there?
A I don't recall.
Q Okay. Is there any way then to tell from this what would be, in stage one what would be the effect of increasing the road traffic?
A Not from this plot, no.
Q Okay, so we'll just, I mean you have not done any, as we say, sensitivity, uncertainty, any kind of analyses with higher road numbers above what Mr. Guckert gave you.
A Have I done any uncertainty consideration? Again,

we talked about 156 was the highest in the United States last year, so uncertainty analysis, how uncertain I am that it would be 180 at the ring road, I'm pretty certain it wouldn't be 180 at the ring road.

Q I'm not asking what you think about that. I'm asking what the analyses and the charts you've done here, and the numbers you've laid out here, have you done, you have not done anything in terms of adjusting Mr. Guckert's traffic numbers for the possibilities they could be higher.

A There is not a need to.

Q So you didn't do it.

A I did not, as I've testified to this, that I did not modify Mr. Guckert's traffic counts, that it was a small factor and I did not modify it. And again, if we're going to hypotheticals, you know, stage three is far more accurate when you can do the same assessment there, it'd be a much smaller number. So you could show a range of hypothetical mathematical calculations if you choose to. They're going to be way over what would be plausible to measure at this location.

MR. GROSSMAN: I know you went over this before, but for some reason I'm having a little mental block. What's the culpability study on the left-hand side of page 12?

THE WITNESS: That's the relative maxima occurring



near the gas queue. That's caused by the gas queue, mostly. The biggest contributor on that side, compared to the right side is showing the loading dock where the gas station is contributing 1.65 micrograms, where it's a more, it's higher, it's 15 micrograms on the left side.

MR. GROSSMAN: Okay. Oh yeah, the arrow tells the answer.

THE WITNESS: Right.

MR. GROSSMAN: I don't know why I forgot that. Okay.

BY MS. CORDRY:

Q One last question, before I forget it. So I know, just you said several times, I just want to make sure I've got it down clearly in my record. What do you think the true number is here? I'm going to give you the chance to say it.

A For what?

Q For NO2.

A One hour?

Q Yeah, one hour NO2.

A I've testified that in my professional opinion, and I'm saying this is my view with a great deal of confidence, that it would be extremely unlikely that the peak, the 98th percentile one-hour value would be beyond the range of 75 to 100 micrograms.



Q Okay.

A And I would say with the best estimate, I would say somewhere less than half of that range, so something less than 77. I'm saying that based upon the consideration, the uncertain, the conservatism in the modeling, and considering the measured data available at various locations around the country. I wouldn't expect it to exceed the 70, much above 75, but I give myself some range.

Q So your, just to be clear then, your position is that this station, with the cars lined up and idling in the middle of a busy mall next to major roadways, the actual number is going to be less than the number, the background number being measured at Arlington.

A In the future, well it's going to be not very different --

Q No, no, no, you're talking about right now, aren't you, Mr. Sullivan? Or are you talking about years down the road?

A The gas station doesn't exist right now.

Q Well, you're trying to model what it will be, so you're saying in a couple of years from now when the gas station gets built it would be 75?

A All my discussions, when the gas station is built. I don't know when it gets built. Let's say a year or two from now, whenever it's going to be, I would say it's 75 to



100, and I think it's going to be something on the order of 75 micrograms.

Q And that's because the background is continually coming down and down and down.

A Correct. And again, in fairness, I gave a range.

Q Okay. And that's because the government is doing all kinds of efforts to bring down those numbers, correct?

A Well, the government is requiring tailpipe emissions on truck --

Q I'm sorry, requiring what?

A Tailpipe emissions on cars and trucks. And that is having the expected effect. It's coming down. And I think that what I did say is somewhere in the middle of that range, which would actually be 87 would be the midpoint between 75 and 100.

MR. GROSSMAN: And where would you expect that to be located?

THE WITNESS: Right in the middle of the gas queue.

MR. GROSSMAN: In the queue, okay.

THE WITNESS: If you're going to measure, which I'm not advocating be done, you could measure in the middle of a gas queue.

MR. GROSSMAN: Right.

BY MS. CORDRY:

Q You keep saying if you wanted to do something, but you're not advocating it should be done. Doesn't that sound a whole lot like what Dr. Cole has said? And you're certainly not advocating that we do these things, are you?
A It's the opposite of what Dr. Cole said.
Q He said, well, and I'm --
A Do you want me to answer the question?
Q I withdraw the question.
MR. GROSSMAN: Okay. All right. Beyond the scope of the redirect anyway, so.
MS. CORDRY: Well, in any case, I think, okay, I think we're done.
MR. GROSSMAN: Ms. Adelman, is there any recross for the coalition?
MR. SILVERMAN: Really just a couple of things. So since --
MS. ADELMAN: Yes.
MR. SILVERMAN: Thank you.
BY MR. SILVERMAN:
Q Since Costco opened its doors, has the air quality in the Wheaton Mall gotten better or worse?
MR. GOECKE: Objection. Beyond the scope.
MR. GROSSMAN: It is. That's beyond the scope of the --
MR. SILVERMAN: He is saying the trends are all in



the right direction and everything's getting better.
MR. GROSSMAN: Okay, I'll let it go.
THE WITNESS: I don't have an opinion on that.
BY MR. SILVERMAN:
Q You don't have an opinion on that?
A No.
Q And how would you go about forming an opinion about that?
A I could do an analysis, and do modeling with monitors.
Q Okay.
MR. GROSSMAN: No more reports.
BY MR. SILVERMAN:
Q Now Dr. Bryce, with regard to, let's see how to say this, with regard to reference monitors, do you agree that having the same monitor over a period of years is generally a good thing in detecting trends?
A I agree with that.
Q And if EPA should decide to stick with one type of monitor, it may be that they want to do that in order to keep consistency in their data so they could look at the direction of things.
MR. GOECKE: Objection. Speculative and beyond the scope.
MR. GROSSMAN: Well, I think he's an expert in



this area.
MR. SILVERMAN: Yeah.
MR. GROSSMAN: I think that's a fair question.
THE WITNESS: Well, I mean it's certainly desirable to maintain stations, core stations, to show trends over a long period of time, and I agree with that, Larry. And to maintain consistency in monitoring is a good idea. I mean obviously in some pollutants like PM2.5, there's some different things being tried and used. Will they eventually settle on one? Maybe they will.
BY MR. SILVERMAN:
Q So that the fact that there's a federal reference monitor doesn't necessarily mean that that is the most accurate, and EPA is not necessarily saying that is the most accurate in the sense of giving the truest number, does it?
A Well, as I mentioned before, I mean my understanding is that it gives the truest number relative to the health studies reviewed in forming the current standard. If in the future they have more BAMs and PMs, and a judgment is made between the two, which one is more accurate, maybe if they set a standard based upon the BAM, then that would become the standard. But right now the standards are based upon the federal reference method, and so that's the defining gold standard.
Q Well, isn't it true that the actual health studies



use all sorts of equipment to measure the levels of pollutants and their health effects?
A Of course whether the standard is written, it's tied to the FRM. So in EPA's judgment they consider the FRM to be the most definitive and most applicable standard that they set.
MR. GROSSMAN: FRM meaning?
THE WITNESS: Federal reference method.
BY MR. SILVERMAN:
Q Well, for example, Dr. Bryce, his, let me find one here, his, I think it's Exhibit 13, it's called a Longitudinal Study of Indoor Nitrogen Dioxide and Respiratory symptoms in Inner-city Children with Asthma. And he says that every 20 part per billion increase in NO2 exposure was associated significantly with an increase in the number of days with limited speech, and so forth. So that measurement, we don't really know what kind of equipment was used for that measurement, correct?
A You know, I'm not a health expert. I'm relying upon EPA standards. I can't answer your question.
Q Right. And the, his Exhibit 17, chronic exposure, fine particles and mortality, extended follow-up of the Harvard six-city studies from 1974, 2009, which, you don't know, you wouldn't know what sort of monitors were used, particularly if they had six cities, whether they used the

same kind of monitor in every city?
MR. GOECKE: Objection. Beyond the scope.
MR. GROSSMAN: Well, it's not really beyond the scope, because we talk about the monitors being used. But it is, he's already answered the question.
MR. SILVERMAN: Okay.
MR. GROSSMAN: He doesn't, he's not a health expert.
MR. SILVERMAN: Okay.
MR. GROSSMAN: He doesn't know what monitors were used in those health studies. He said that the use of this, the reference, is based on the fact that EPA uses that tool and sets its standards by that tool. All right. Well, then we are finished with you, Mr. Sullivan. I thank you very much. I've learned a lot from you, and from your direct and cross-examinations. Thank you very much.
THE WITNESS: You're welcome.
MR. GROSSMAN: All right. What's the pleasure of the group here? Do we turn to Dr. Cole now, or do we discuss objections, or do we just go home?
MR. GOECKE: Well, we've got an environmental free day on the 20th --
MR. GROSSMAN: Right.
MR. GOECKE: -- so it seems useful to begin Dr. Cole now, to take advantage of the time we have with him.



MS. ROSENFELD: Please --
MS. CORDRY: Twenty minutes?
MS. ROSENFELD: -- 20 minutes left?
MR. GROSSMAN: We don't have a lot of time for him.
MR. SILVERMAN: Can we discuss some objections in the last 20 minutes?
MR. GROSSMAN: We could do that. Do you want to do that instead, or --
MS. CORDRY: Well, there's a few. Maybe we could --
MS. HARRIS: Well, there's also the question of do we need a new hearing date. And also we would like to know if the opponents and their surrebuttal are providing other witnesses besides Ms. Cordry and Dr. Cole.
MS. ROSENFELD: Well, for the 20th I think the witnesses will be Ms. Cordry and two other individuals.
MS. CORDRY: Two other people talking about, essentially about traffic issues. If they are, they're very short. And I would expect we can also wrap up anything about the objections on that day as well.
MR. GROSSMAN: Well, I remind you, you said that you're not calling those other two witnesses. They're just members of the community, is that correct?
MS. CORDRY: One is, and the other might be Jim



Core (phonetic sp.) might come back, so I forget if we called him before or not.
MR. GROSSMAN: Well, once again, it's got to be rebuttal --
MS. CORDRY: Right, I understand.
MR. GROSSMAN: -- surrebuttal, I should say.
MS. ROSENFELD: Right, surrebuttal.
MR. GROSSMAN: So all right, and they will represent that they have either heard the testimony or they have read the transcript? How are they going to --
MS. CORDRY: They can have them read if there's a particular piece that they are needing to rebut, yes.
MR. GROSSMAN: All right. Because I don't want to have, I don't want just to have repetitive testimony of what Mr. Core testified before.
MS. CORDRY: No.
MR. GROSSMAN: I remember his testimony quite well. Okay.
MS. CORDRY: It would not be what either one of that that appeared at all, and would not have anything to do with what Mr. Core testified about.
MR. GROSSMAN: All right. How long do you anticipate the direct of Dr. Cole?
MS. ROSENFELD: I would expect it would probably take the better part of a day. I think we would probably



finish in a day. But I would expect it to go probably through early mid-afternoon.
MS. ADELMAN: So he'll start on the 22nd --
MR. GROSSMAN: Right.
MS. ADELMAN: -- which happens --
MR. GROSSMAN: That's the last day we have testimony scheduled.
MS. ADELMAN: That's right, and it happens to be his birthday, so we'll have a cake and ice cream.
MR. GROSSMAN: No ice cream unless his answers are very short and quick.
MS. ROSENFELD: And Mr. Grossman, I do expect that we will also call Dr. Jison back.
MS. HARRIS: On what basis? We presented no health, testimony regarding health except for the very few questions that they asked Mr. Sullivan, which was in terms of the standards.
MS. ROSENFELD: Well, I do think that Mr. Sullivan has provided different analysis with respect to the levels of emissions, and we're entitled to have a health expert respond to whether or not that affects conclusions directly related to the impact of the levels of emissions on health.
MR. GROSSMAN: Actually I think they have a fair point. Assuming that the rebuttal report is accepted after we hear from Dr. Cole, it does present additional evidence

regarding the levels of pollutants. And so I guess one could argue that they're entitled to have a health expert come in and say that even those levels of pollutants are problematic, I suppose.

MR. GOECKE: I think she's already testified to that.

MR. GROSSMAN: She has to some extent, at least with regard to PM2.5, saying 2.5, I'm not sure, like I said, I'd have to look back at the NO2 testimony. But in any event, so but I would expect it to be directed to that narrow a point, that is something --

MS. ROSENFELD: I agree. I agree.

MR. GROSSMAN: -- is truly surrebuttal.

MS. ROSENFELD: So based on the rebuttal report. Of course if you rule to strike it, we're happy to withdraw Dr. Jison as a witness.

MR. GROSSMAN: Okay. I don't want to, as I said, I don't want to make up my mind on that --

MS. ROSENFELD: Sure.

MR. GROSSMAN: -- until I hear from Dr. Cole. Okay, so let's think of some other dates. A lot of people were expecting us to be done in May, including me.

MS. CORDRY: I think we might get by with one more day.

DR. COLE: I don't see how.



MS. CORDRY: And I can't recall, the discussion of the conditions, was there going to be a discussion of the conditions?

MR. GROSSMAN: Yes, I don't see any reason not to have it. I mean there are some that are agreed to, and we can talk about the others. I don't know that anybody's mind's going to change. I usually have a set of conditions I generally use in any event, which would be kind of superimposed on those. And I may or may not accept everything that was said in the proposed conditions, so we'll have to go back over that. I did go over the ones that were submitted, but it's been a number of weeks, and I don't remember exactly what my, all of my conclusions were. I have to look at my notes.

All right. So let's talk about dates.

MS. ADELMAN: No Wednesdays, right?

MR. GROSSMAN: No Wednesdays, because the Board of Appeals is on Wednesdays.

MS. ADELMAN: I'm not available on the 5th of June.

MS. CORDRY: So the 26th is Memorial Day, correct? And the 28th I am in hearing.

MR. GROSSMAN: The 28th is a Wednesday anyway.

MS. CORDRY: It's Wednesday anyway, okay.

MR. GROSSMAN: Do I hear any suggestions? I have



to tell you, I am going to be out of town from June 13 through June 21.

MS. HARRIS: How about the 29th of May?

MR. GROSSMAN: The 29th of May. Do I hear any bidders for the 29th of May?

MR. GOECKE: That works for me.

MS. ADELMAN: I have to double check. I mean this will all be double checked.

MS. CORDRY: We have to check with Dr. Jison, because she's the most likely going to be on that day.

MS. ADELMAN: And Dr. Cole needs to check his calendar, and I'm --

MR. GROSSMAN: All right. Can you all e-mail me tomorrow?

MS. ADELMAN: Mm-hmm.

MS. HARRIS: Are we just identifying one day?

MR. GROSSMAN: Well, we've got three more days, if we count that, so --

MS. HARRIS: Okay.

MR. GROSSMAN: And I have to look back at my calendar also, but I think I'm okay on the 29th of May. So we'll check it out.

MR. COLE: Mr. Grossman, I have a commitment on June 3rd.

MR. GROSSMAN: Okay.



MS. HARRIS: Not being committed.

MR. COLE: I don't know. You never can tell.

MS. HARRIS: Well, it may be happening. I'm reasonably open that first week in general.

MR. GROSSMAN: All right. So we're looking at May 29. Is there an alternative day that, how about May 30?

MR. GOECKE: That does not work for me.

UNIDENTIFIED SPEAKER: No, me either.

MR. GROSSMAN: All right, how about June 2?

MS. ROSENFELD: I have a brief due that day.

COURT REPORTER: Mr. Grossman, do you want to go off the record at this point?

MR. GROSSMAN: No, let's just do a little bit --

COURT REPORTER: Okay.

MR. GROSSMAN: How about June 5?

UNIDENTIFIED SPEAKER: I think that works.

MR. GOECKE: That works.

MS. ADELMAN: I won't be available.

MR. GROSSMAN: June 6th?

UNIDENTIFIED SPEAKER: How about the 3rd?

MR. GROSSMAN: The 3rd is no good --

UNIDENTIFIED SPEAKER: Oh.

MR. GROSSMAN: -- for Dr. Cole.

UNIDENTIFIED SPEAKER: June 6th works.

MR. GROSSMAN: June 6?

MR. GOECKE: June 6 works for me.
MS. ADELMAN: Not for me.
MR. GROSSMAN: Hmm?
MS. ADELMAN: Not for me, sorry.
MS. HARRIS: Can we, I mean we have, these hearings have expended an awful long time, and I feel like we've been very patient and accommodating to everyone's schedules, but I hope people can be as flexible as possible at this stage.
MR. GROSSMAN: Yeah, I would hope so. Well, we're trying to figure out another day here. June 9, what does that sound like?
UNIDENTIFIED SPEAKER: June 9, going once, going twice. We probably do need --
MS. ADELMAN: What date are we on now?
MR. GROSSMAN: June 9.
MR. GOECKE: I'm available then.
MR. GROSSMAN: All right, so now we have two days that are, that seem like they're going to be okay, May 29 and June 9. So everybody get back to me tomorrow by e-mail. Tell me if those are okay.
Let me see, I may just announce them at the public hearing if we select it, rather than sending out the formal notice, given that we're in our surrebuttal case at this point, and just announce it, as were the last two under the



Board of Appeals rules, at the public hearing on May 20, assuming you would all agree. But I do want to know as soon as possible. Okay, so e-mail me tomorrow. And I don't think we have much time for going over the objections now. Let's just pick them up at the next session.
All right, if there's any other business? Hearing no other business, we are adjourned. Thank you.
(Whereupon, at 4:50 p.m., the hearing was adjourned.)



**C E R T I F I C A T E**

**DEPOSITION SERVICES, INC., hereby certifies that the attached pages represent an accurate transcript of the electronic sound recording of the proceedings before the Office of Zoning and Administrative Hearings for Montgomery County in the matter of:**

**Petition of Costco Wholesale Corporation**
**Special Exception No. S-2863**
**OZAH No. 13-12**

**By:**

**Margaret L. vanEkeren, Transcriber**

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