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DR. KENDALL: We have two individuals scheduled for public comments. So we will reconvene the SAP.

The first individual would be Mark Russell from Dupont.

Dr. Russell, welcome. Please state your name and affiliation for the record.

DR. RUSSELL: Mark Russell. And I work with the Dupont Crop Protection. But today I'm here on behalf of the F Q P A Implementation Working Group.

And I have several brief comments on the EPA methodology used to estimate drinking water exposure.

The first comment before we get into any details here is really to commend the EPA for the enormous amount of work that they have done in figuring out a creative way to address cumulative assessments.

Something that may not be apparent to the SAP here if you don't do modeling yourself is there is 1,001 details. And it only takes one or two going wrong for the whole thing to create a real nightmare. They have done a lot of work here. There has been a big challenge of combining data from different scales, adapting existing models to do things they weren't originally designed to do and finding creative ways of addressing the problem of doing a cumulative assessment.

The first thing I would like to point out here about the index

reservoir model -- and all these things were essentially covered rather thoroughly by Kevin and Nelson, is that this is -- the index reservoir model is a conservative lower tier screening model. And that is how it has been described.

It is based on a single vulnerable watershed. So it does mean that when the model generates all these numbers and we use them for regulatory assessment purposes, there are other areas within those watersheds with much lower exposures, much lower drinking water concentrations.

So there is a worst case element built-in right there.

They did follow SAP recommendations and regionalize it where they have adapted the environmental and climatic data on the 12 different regions or actually condensed them a bit.

But this model does assume edge of field run-off and erosion directly entering the reservoir. That is just part of the limitation of the PRZM/EXAM model.

So it is not properly a watershed model, but it's an adaptation of it to try to estimate that. And we need to keep that in mind.

Finally, the numbers out of this model are being treated as the exposure indicators for a large multi-state region with growing multiple crops.

So you have adapted this worst case scenario for that purpose.

In '98 and '99, the EPA presented a number of comparisons between the results obtained from this model with monitoring studies.

One of the frustrations that occurs is you only have a handful of monitoring data, and the model predicts daily data.

They tried to do some comparisons to get a feel for were they overpredicting, underpredicting. What they generally found was that for high use rate chemicals used over a significant fraction of the watershed, they did a pretty reasonable job. The model was reasonably conservative.

But for many other chemicals, it provides higher estimates than the existing monitoring data.

I think people tend to focus on a few numbers where maybe the model will underpredict a single event or two.

But systematically, the model is more likely to overpredict because of how it has been put together and how it is being used. That's no fault of the EPA. It is just the limitations of this technology.

In the interim, the EPA has also added a spray drift component, or revised it, actually. And there is the potential that could contribute to some additional overprediction or bias.

This last point, the previous speakers have agreed they

recognize that they need to do this, the EPA should perform a comparison of the model to monitoring data. Essentially, pull it together and publish the results for peer review to more clearly define the capabilities and the limitations of this drinking water assessment method.

There are a number of very significant accomplishments, though, that the EPA has made through offering of this tool. And the first and foremost is the use of distributions of daily concentration. They are now compatible with Calendex.

The one slide that we showed earlier that had the nice little, bright red line, the one in ten year concentration, you can just imagine what contribution that makes to an assessment as opposed to using more realistic distributions of data that vary in time. So that's a significant upgrade.

And then the practical fact is that use rate determines concentration. And using the typical use rates and typical numbers of applications, adjusting those with cumulative adjustment factors are all EPA's attempt to come up with a cumulative assessment that realistically reflects the concentrations likely to be out there. And we applaud those kind of efforts to add realism in refining these assessments.

And I have already mentioned before, there was regional variation of data as opposed to using one big national scheme.

Our bottom line assessment when we look at what has been offered up, we agree with what is being done for the OPs in that if water is a minor contributor to the overall MOE, it makes sense to say that this methodology is sufficient.

It is generally conservative. It provides a high end estimate in general. It seems to be a sufficient way to cap the potential exposure from the drinking water.

However, if water proves to be a major contributor, it is probably appropriate to consider refining this methodology and ensuring that the predicted values are as consistent as possible with monitoring data.

So that the whole weight of evidence of both modeling and monitoring tend to agree rather than acknowledging some kind of systematic bias.

And my final slide is the need for a more refined assessment has been recognized by a number of groups, including the EPA, USGS and USDA. A working group has been established to develop improved modeling methods based on national monitoring data.

The IWG and Crop Life America strongly support this effort to

produce more realistic evaluations of pesticide concentrations in drinking water.

Thank you.

DR. KENDALL: Thank you.

Any questions from the panel for Dr. Russell? Dr. Roberts?

DR. ROBERTS: Let me ask you this question, and maybe the EPA wants to respond as well.

At the end of their presentation, we were talking about how far off the model predictions were from the monitoring data. And it was mentioned that in some cases the monitoring data were up to an order of magnitude higher, but that those tended to be in things like streams, which is -- in high intensive agricultural use areas.

And I can see there is sort of perhaps a locational mismatch in terms of trying to take monitoring data from streams and comparing it for a predicted concentration for a reservoir that would be presumably downstream.

Can you give me your assessment having taken a look at this data, the data that are available of comparing them on the same basis, in other words, monitoring data from reservoirs versus predicted concentrations for reservoirs, how far are they off and what directions and sort of in what frequencies.

Can you kind of give us a feel for that?

DR. RUSSELL: There are two recent reservoir based studies. One is a study of OPs done by OP registrants. And the second is a 12 reservoir study conducted by the US EPA.

I haven't systematically -- there is no way that you just off the cuff directly compare those to the results that they have generated in this OP case study.

But in general, if you look at the concentrations, the model seems to have the general capability of overpredicting what has been observed.

When people talk about the model underpredicting basis monitoring data, very frequently it is just one or two data points.

And then it raises some concern because monitoring data is only collected periodically. You don't know for sure what went on in between those sampling events.

There could be the presumption that it was uniform. But in a stream, that's not true. It is usually very flashy. So in a stream, if there is -- if the model underpredicts, it may not be as much of an issue as if it were a reservoir.

DR. KENDALL: EPA, would you care to comment?

MR. COSTELLO: There were a lot of things he was talking

about running through my mind. Would you mind just repeating that again so I can make sure I focus on your --

DR. ROBERTS: I'm sort of interested in model versus monitoring data comparisons on what I think, suspect, is probably the most valid point, which it would be reservoir data, since that's what the model is trying to predict.

Stream data is arguably something different. So if we sort of throw those out and just concentrate on monitoring data that most closely represent what the model is trying to predict, how far are they off --

MR. COSTELLO: If we did that, in a lot of those areas we would not even have anything to compare with.

We are just now in recent years starting to see more systematic monitoring of reservoirs. One of the reasons for the USGS EPA's pilot reservoir monitoring data was to start asking a few questions about what do we know about the nature of pesticide occurrence in drinking water reservoirs so that we can do that.

And that study has just recently been published. And we're looking through that. We are looking at some other areas, but I think a lot of that was designed to start answering some questions how frequently do you sample, how often, when do you focus it.

The working group that Mark Russell mentioned is another step along those lines in terms of getting national monitoring data focusing on reservoirs and some of the areas where we need to fill in the holes.

Part of that is -- the reason I gave you the comparison I did is because that is what we had to work with. As Kevin pointed out, we don't have any single definitive study to focus on. So we're pulling together from as many different sources as we can.

MR. THURMAN: And remember, just because our current modeling tool is reservoir tool, it doesn't mean that monitoring data we get from streams is not important.

They are a very important source of drinking water around the country. And if we were to see large potential exposure from drinking water derived from streams, then rather than not consider that, we might have to reconsider how we're doing our drinking water assessments.

DR. ROBERTS: Thank you.

DR. KENDALL: Any further questions for Dr. Russell?

Dr. Portier?

DR. PORTIER: I'm going to beat a dead horse because you pointedly asked the question about relative myriad of the water data. I'm going to re-ask Steve's question again.

For the reservoir monitoring data that you have in comparison to what you predicted, how often, what is the largest magnitude error you are seeing, and how many data points is that error occurring in.

That's the real question in terms of whether you are conservative or not. If there are a million data points and you are off one time, you are conservative.

If there are five data points and you are off one time, I would argue you aren't conservative.

That's the question I need answered.

MR. COSTELLO: One of the challenges -- let's take a look at USGS, the pilot monitoring, because that was the one we had available at the time we were doing comparisons, that we had available for any length of time to look at.

Of the 12 reservoirs they looked at, only one was located in a high use area, in one of the regions that we did our assessment. So there was only one where we could do that direct comparison.

DR. PORTIER: High use for the OPs?

MR. COSTELLO: High use to the OPs. That original study was designed to target a number, variety of pesticides.

It wasn't specifically focused on OPs, so we weren't necessarily expecting it to be that way everywhere. We are just now looking at --

an initial eyeball's looks is that we're in the same ballpark. We're not way off on that. We're still doing an analysis of that part of it.

The other thing to keep in mind is that when we were doing that comparison, that was basically run in two years. Particularly, when you look at the area, the reservoir where we were taking a look, which to do direct comparisons in North Carolina, the first year in the east we had basically a draught. The second year or part, toward the end of that year, there was a hurricane that went through and pretty much overwhelmed things. So we had two extremes.

And we really had trouble trying to interpret what that data meant directly. So that's part of our trouble that we have on that.

When we have looked at the water, the stream monitoring, we know that's a different -- whenever I basically seen there is one or two with few known detects, we basically started looking not just one or two higher. We were taking a look at a number of things.

How many are higher. And if -- if there was one that just stuck out as an outlier, we basically said, okay, that could be just one spike that we hit. But we were looking at several that would come up on that.

MR. THURMAN: But if you think back to the slides where we gave the history of coming to the SAP and getting guidance, this is a

direct result of the SAP guidance to focus on monitoring to allow us to develop and evaluate -- monitoring so we can develop and evaluate our models.

So here is where we are in the process. We have a pilot reservoir monitoring study. And the OPs came up soon after.

So this program, which is exciting to us, is early on. And that kind of data will be used to develop and evaluate for future modeling.

DR. KENDALL: Further comments for Dr. Russell?

Thank you.

We have one more registered public presenter, Dr. Judith Schreiber from the New York State Office of the Attorney General.

DR. SCHREIBER: Good afternoon. Dr. Schreiber from the New York State Attorney General's office.

I had a couple of points. First, a point of clarification for myself. I might have missed something, but I just want to make sure that it is true that if the OP has been canceled, then the water route of exposure is not considered in the assessment. Correct?

MR. THURMAN: That's true.

DR. SCHREIBER: For groundwater I know, at least in my experience in New York state, there certainly are occasions where when groundwater is contaminated it remains contaminated for a

substantial period of time afterwards because it doesn't really lend itself to cleansing out as it does in surface water situations.

So I was wondering whether the EPA has assessed the impact of residues in groundwater that remain even after the cancellation of the organophosphate in question whether you have conducted any modeling or assessment to look at how long these residues might be expected to remain in groundwater.

Also, one big item that I didn't recall, hear being discussed, maybe it was discussed and I missed it, is sole source aquifers.

In New York state there is a number of sole source aquifer areas. In particular, Long Island, which is a heavy populated area outside of New York City where many, many people rely on groundwater as the only source of drinking water.

Has the EPA looked at sole source aquifers in the nation to determine whether in fact your assessment has adequately taken into account people who rely on groundwater, and that groundwater supply, if contaminated, is really, highly unlikely to cleanse itself in any short period of time.

And then, finally, not to beat this dead horse with the infant formula, but let me just give it one more stab, and that is for infants zero to six months of age, either they are ingesting breast milk or they

are ingesting formula, period.

Children that young do not eat solid foods, baby foods or anything else. So even though the level of OPs in drinking water may be very low, at that stage of an infant's life, especially given the sensitive neurological development, in fact, the reason why we're doing this OP assessment in the first place, I would think that the EPA should really take a hard look at that very small period of time when the infant is being exposed theoretically to organophosphates in drinking water directly used for formula or more indirectly through the mother's breast milk which may have contaminant levels.

I would also point out that I do take issue with the statement made this morning about the similarity of human breast milk to cow's milk in terms of its contaminant levels.

I would feel pretty strongly based on the work that I have done, I have done a lot of work on maternal and children's health issues, including breast milk exposures, that, in fact, women are exposed to a much wider variety of OPs than are cows. And therefore, being higher on the food chain than cows, also would be most likely to have more organophosphates in milk than a cow would.

And I can provide you with some of that data if you are interested.

So those are points that I had as questions. I don't know if anybody wants to answer those or have a discussion.

DR. KENDALL: Thank you.

Would EPA care to address some of those issues?

MR. THURMAN: To the extent that in our presentation we discussed the possibility that groundwater exposure is not fully addressed by our surface water assessment, I guess I would have to stand by that.

There are certain -- there are a few of the OPs that in our original assessments were seen to be great contaminators, if you will, of groundwater.

And as far as a cumulative assessment go, we have no data, actually, that indicates that OPs are found -- that they co-occur in groundwater.

Our biggest constraints were first, again, the lack of a model to allow us to get daily distributions for use in Calendex and then the lack of monitoring data. Especially, monitoring data that actually shows OPs getting to groundwater.

As a class, they are not a groundwater concern compared to many herbicides, especially. But we have to look at some of the individual OPs.

As far as looking at sole source aquifers, I guess that was part of what I was trying to address when I said in our regional assessments.

For those areas that groundwater was the main source of drinking water, we did try to look at what the hydrology and the local geology are.

I know that in Florida, for instance, we considered that -- in southern Florida a sole source aquifer there, and had to basically just characterize the risk because we could not quantify the potential for risk through drinking water -- groundwater sources of drinking water.

MR. COSTELLO: We have already done individual screening assessments for all those chemicals.

And so part of what guided us to saying surface water -- if we focus on surface water, it is going to be protective of groundwater is based on those individual assessments.

You can get some pesticides that do persist in groundwater, but it depends on the chemical properties of pesticides.

We don't have a whole lot of monitoring -- we have a few monitoring, continual monitoring on a couple of OP pesticides. They are not suggesting years and years later they are still there.

And I think that's partly because of the properties of the

pesticide in terms of their persistence.

There is a lot of uncertainties we have. And we're just basically going by what we have in terms of --

MS. SCHREIBER: What I heard before, what I thought you were saying is that the groundwater wasn't considered because there wasn't enough monitoring data and there was no good models available. So it was kind of wrapped in to the surface water assessment assuming that if it is conservative enough for the surface water, it should also work for groundwater.

Is that basically what happened?

In other words, if it is protective for surface water in your view, it would also be protective for --

MR. COSTELLO: That's based on a number of things, including individual assessments as well. There's a wide variety of things. We're trying to say in a number of minutes what we have wrestled with for years and months to come up to --

MS. SCHREIBER: I realize a lot has gone into the assessment.

MS. MULKEY: One thing that may be helpful with regard to all the public comments is that we will work to be sure that as part of our public comment process we have a response to comments document.

So that we have a forum and a mechanism to assure that we

want to be as forthcoming as we can in this forum and every other.

But we also want to make sure that we don't treat this as the only way that we can effectively communicate our approach.

It is clear that there is a lot of public interest in some of these issues. Breast milk we knew was an issue of considerable public interest, formula.

And obviously, we're trying here to seek science peer review. But we will also make every effort to be sure that we clarify the kinds of things we're saying.

And we welcome public, both factual inquiries, which we will try to answer informally as well, and then comments that we can focus on and address along these series.

DR. SCHREIBER: Thank you.

DR. KENDALL: I think that's well put. You have to understand they are hearing some of these questions for the first time. They need a chance to think through and get a good response to you.

And I think they have tried to at least address some of the issues. I'll ask the panel later on when we get into the question and answer period, I'm going to ask some of these questions, maybe some of their perspectives on it too.

DR. SCHREIBER: I was just going to mention that I will try

when we send in our comments to attach data that we have that might be helpful to look at some of these issues.

DR. KENDALL: I was going to ask you to do that. That would be very valuable. Will you do that?

DR. SCHREIBER: I certainly will. Thank you.

DR. KENDALL: Thank you very much. We have one additional public presenter that has just requested to speak, Dr. Jennifer Sass from the National Resources Defense Council.

DR. SASS: Hello. Jennifer Sass, NRDC.

With regards to the water risk assessment, also the cumulative risk assessment and a little bit of the food risk assessment, it occurs to me that public health uses are not included anywhere in the risk assessment.

Section 18 are emergency exemptions. Those tolerants that are issued are not included anywhere in the risk assessment.

As an example, which is in my written comments that I submitted, coumaphos, which is very potent as a toxic OP currently has tolerances that number over 150 right now for bees.

It's a very important public health concern if you are a bumblebee. There is over 150 tolerances out. It is detected in the honey, and it is not considered anywhere in this cumulative risk

assessment as very potent.

In the water, we have assumed typical uses. Not even the uses that are the maximum allowable uses on the label. Forget illegal uses. We're not even going to the maximum label.

And it occurs to me that there is a lot of regulatory decisions that are being inserted in this cumulative risk assessment that aren't being allowed to be discussed as regulatory decisions.

And I would challenge the EPA to take some of those regulatory decisions out so that we can argue them later in the proper forum and challenge you in the water assessment to give us an assessment that includes typical but also includes maximum use rates the full gamut of label and application use rates and patterns and anything that you have data on in terms of illegal or over-uses or those possibilities.

And in addition, public health uses where in states like Florida these are very routine. These are not unusual.

Thank you.

DR. KENDALL: Any questions for Dr. Sass?

MS. MULKEY: Maybe it would be helpful. We are going to try to address some of these. Public health is discussed in the residential analysis, for example.

But there was one comment that I simply didn't understand.

Maybe everybody else did. But I didn't understand the statement about regulatory decisions, that people are not being allowed --

DR. KENDALL: I did not understand that.

MS. MULKEY: Maybe it would be helpful just to have that comment clarified.

DR. KENDALL: I agree. Can you clarify it for us?

DR. SASS: Yes. It feels to me that we are already making a decision to bias to the mean in a lot of ways.

We're making a decision to choose the average to assess on as in average or typical use rates and patterns which are going to result in average or typical exposure so that in this risk assessment I'm comforted to know that on an average or typical day for an average or typical person they are going to be average or typically safe.

But that is not what this cumulative risk assessment is supposed to be addressing.

MS. MULKEY: I understand the point now.

DR. SASS: Is that clear?

DR. KENDALL: I think so.

Any questions from the panel on clarity of that issue?

Thank you very much.

Does anyone else choose to approach the panel for public

comment?

If not, we will close the public comment period.

Now, gentlemen, read the first question.

MR. THURMAN: After evaluation of available monitoring data and consideration of the available tools for estimating pesticide exposure in drinking water, the agency adapted available tools to provide watershed level estimates of residues in drinking water sources.

These tools have been presented to the SAP in the past in relation to individual chemical assessments and have been improved as a result of panel feedback.

Because of differences between individual and cumulative assessments, this assessment reflects novel uses for some of these tools.

The approach used in the preliminary OP cumulative risk assessment, first, used PRZM/EXAMS with the index reservoir along with local site characteristics to estimate concentrations in drinking water reservoir.

It simulated multiple OP uses on multiple fields within that watershed.

It adjusted for area within the watershed that potentially

contributed OP loads to the reservoir using a cumulative adjustment factor.

It provided a qualitative rather than quantitative assessment of treatment effects on residues.

So the question, are there significant flaws in this approach and its assumptions that would be likely to lead to consistent significant underestimation of daily levels of residues in surface water across the calendar year, for instance, an order of magnitude.

If such flaws exist, what can be done to correct them. What additional information and/or tools might be available that will meet the goals/needs of the cumulative OP assessment.

DR. KENDALL: Dr. Capel, could you lead off, please?

DR. CAPEL: Sure. Thanks. First of all, I would like to compliment the OPP staff in the use of the modelings and the choice.

I think at this point in time it's the appropriate choice to do.

I think that you have advanced the use of these tools by going to multiple compound, multiple application time and making it geographically specific and realistic. There is some real progress that has been made.

But I think as you said to start with and the public comment, that this is still a first tier, adequate for organophosphate phosphates,

but as we look forward to the future, there are going to be needs of future generations of more sophisticated or more different types of models that are needed.

I'll make a number of comments here that are somewhat unrelated but they kind of fall in this category of significant flaws. I think it's a unique choice of question.

The first is the water treatment processes. And this is kind of outside the PRZM/EXAMS modeling, but it is part of this question here.

There was done some qualitative work on chlorination and softening hydrolysis reactions. What hasn't been thought of or included are other oxidation reactions like ozoanation (ph), which is becoming a very important disinfection step in many water treatment plants and also the effect of absorption of activated carbon and anthracites and others.

In the reservoir study that we talked about, the 12 reservoirs, I think nine of those include some sort of activated carbon anthracite removal step.

So it is not a nontrivial part that I think needs to be considered in the water treatment side of things.

I still have the question that I asked before about the

incorporation of the transformation products in the model. It is not explicit of how those were incorporated. And I think it would help to expand the text and help the reader to understand exactly how you incorporated the transformation process in the modeling scenarios.

And if I read the literature right, the auxins are not trivial in terms of their environmental production. So I think categorically leaving them out may lead to a significant underestimation of perhaps the exposure.

The modeling scenario that you presented is kind of a mixed bag. It's a vulnerable area, but it is typical rates. Other people have made this sort of comment. It is kind of an ill-defined scenario. Kind of worst case, but not really worst case.

And in a couple places in the document, you make the comment that OPP is confident that this is a conservative estimate.

I think you need to quantify that comment. And one way of doing it is by some sort of sensitivity analysis that is over the range of crop application rates, over the range of application times, over the range of KOC values or field half lives.

There is all sorts of different ways to test the robustness of the numbers that are coming out of the model.

And in some ways you have done that through using 36 years of

weather. You have looked at sensitivity analysis from weather things.

I think as you move forward, that sort of sensitivity analysis would be very valuable.

One of the things that is not accounted for is the contribution of organophosphates from nonagricultural sources, particularly urban home and garden sources to surface waters.

And we know that many streams have urban or small residential areas that will contribute and then go down and enter an agricultural area.

We showed a few years back that probably the predominant source of diazinon to the Mississippi and to the New Orleans drinking water intake is urban use and in the mid west rather than agricultural use.

And so I think there is some nontrivial urban sources that should be considered in the overall picture.

Kind of looking forward, groundwater is an important for the organophosphate phosphates. I think that is correct in general. But again, I think in one way you kind of lucked out with starting with the organophosphates here, because many other compounds we're going to need a significant groundwater exposure component.

So thinking ahead, that's going to be a nontrivial component to

put forward.

The model and monitoring comparison data that is in the appendices and what some of the panel have asked about before I think is rather simplistic and can be expanded. Maybe something like simply comparing the distribution profiles of the model versus measured data might help, rather than just discussing the maximums. Because I think we lose a lot in that.

The one public commenter from the IWG commented on addition of the spray drift model to the EXAMS and the overestimation that could contribute, I think it is another good addition to add and to evaluate what is that and, again, to do a sensitivity test.

It will probably turn out as not significant to the drinking water. But it does raise an important part that I think is missing from the overall assessment. And that is, exposure through ambient air.

We have exposure through residential use air. But there is also a background that we're all exposed to year round. And we know this from observations of the organophosphates in air, organophosphates in rain.

So this is something that might be added to the overall picture, not necessarily linked to drinking water itself.

Finally, the point that more monitoring data is critical, I can't agree with more. Both EPA and the public commenters have made this. And I think we need to think down that pathway to help validate these modeling tools.

DR. KENDALL: Thank you.

Dr. Engel, would you like to carry on?

DR. ENGEL: Thank you.

Let me first again commend EPA for their efforts in this task. I guess I have seen that you have really taken to task a number of the SAP comments in the past, and those have certainly shown up in this work. I think you are to be commended for that as well.

I guess in general, my thought is that the approach that has been taken should provide fairly conservative kinds of estimates. Certainly, we have heard some discussion of things that would maybe not make it as conservative as one would like.

But I think at the same time as you dig in and look at your approach, there are a number of things that tend to be overly conservative.

So on whole, I think you end up in a fairly conservative place.

A sensitivity analysis, I guess, would help in following up on some of that and making sure that you are as conservative as one

would hope to be.

Beyond that, let me go through a number of somewhat random comments here. The order may not make a lot of sense. But those are the order on my screen.

So let me tick through those so I don't miss any of these. Some of these will be duplicates of issues that have been raised already.

First, I think additional validation of the model in modeling approach would be extremely helpful to you and would be useful to the scientific community as a whole.

So I think that builds on a number of things you have heard already suggesting that. So I would encourage you some validation would be very helpful and please publish that.

You have already stated as well that in the cases where observed data were higher than your predicted results you are following up and digging into that a bit more.

I would encourage also you to continue to dig into that so that you can better understand what has caused that. Is that due to extreme weather that you didn't see with your model. Is that due to pesticide spills. Is that due to urban influences.

So if you can help quantify why that is occurring, I think, again, that will help you in understanding just how conservative you are

being with the model and whether you are on the right track.

Sensitivity analysis. Let me follow up on that as well. In particular -- you had indicated that the pesticide application timing should provide a conservative estimate. I'm not sure that's the case.

Based on some work that we have done, it may turn out that a distribution of timing just because of the weather you get from a limited number of years will in fact give you higher estimates.

So I would hope that you would really dig in on the sensitivity analysis with pesticide timing to make sure that in fact what you think is conservative is conservative there.

A couple ways you might approach that, one, moving that timing around, assuming some distribution or longer weather periods.

I think with longer weather periods with a single date of application you are more likely to catch weather that would result in kind of worst case kinds of run-off events.

I noted that in some cases the weather that you used is not all that local. And I guess in particular, in your heartland region your watershed was in Illinois, the weather that you used was in Ohio.

Probably, that is not too bad of an assumption for that part of the country. I didn't look as closely at some of the other regions as to how well watershed location matched the weather location. But that

may be an issue in some cases. It is worth investigating as well.

So more local weather data would seem to make a lot more sense in those instances.

Again, the urban impacts within the water, that seems to be overlooked. It may not be significant in this particular case, but I think something that does need to be discussed. And you will have to find some way, I think, to deal with that and treat that.

Subsurface drainage and irrigation. We can probably kind of lump those together. I think the assumptions that you use there you probably need to very explicitly state those and really, again, make sure that those give you some worst case or something toward the conservative end of things.

I'm not sure that you are dealing with subsurface irrigation for this particular set of model runs in the future with other products that may be more significant.

And I would offer some ways that you might think about dealing with that. We'll make sure those get in the report. But in general, one approach we have taken is to use the subsurface estimates of pesticide movement to the bottom of the root zone, use census of agriculture data about subsurface drainage and make the assumption that those multiplied together represent the portion of material moving to

groundwater that shows up in surface water.

I'll provide additional details about that in the document. But in the future, that may be a way to account for subsurface drainage.

I guess the remainder of the comments are repeating what you have heard earlier, so I would stop there.

DR. KENDALL: Thank you, sir.

Dr. Richards?

DR. RICHARDS: Thank you.

Coming third in a list of three respondents, you sometimes find that your points disappear right out from under you. I still have a few left amazingly enough.

Like the other two, I want to commend you on really pushing this process forward. And I think the level of detail and subdivision that you have been able to accomplish is a big step forward and an important one. And, obviously, makes for a very complicated pile of stuff to analyze too.

To respond specifically to the thrust of the first question, it seems to me, at least, based on my experience, that this approach is unlikely to lead to substantial underestimation of the exposures, particularly, to sort of throw together some of your chosen words, particularly ones that would be, say, consistent significant

underestimation by an order of magnitude across a whole year. I think that's highly unlikely.

However, there are some ways in which I think I can see the possibility of underestimation occurring. The one I would comment on is that the model in effect or the approach in effect only models nonpoint source run-off processes.

And in our work, looking at run-off in northwest Ohio and other parts of the midwest, a few of the highest concentrations that we have observed over the years for pesticides in general really don't appear to be due to nonpoint source run-off processes.

They don't happen during storm run-off. They happen at a time of year when typically we don't particularly expect to see high concentrations.

And they quite possibly represent either spills or intentional dumps of left-over pesticide material.

These, I think, are not something that the whole approach is basically able at this point to take into account.

Now, to try to put them in perspective, I would say that based on our experience to see one of these on a watershed once every 10 years might be -- I would expect to be no more frequent than that and hopefully less frequently than that.

On the other hand, I did a very simple kind of a calculation. If I were to get an episode of this sort on one day out of the year and assuming kind of typical concentrations for the river system as otherwise, that one day might increase the exposure by something on the order of 30 percent for the annual average.

So it's a significant bump. It is not an order of magnitude. And it's a low probability event. But it is one which I think we don't have any current way of taking account for.

So one of the things you may want to think about is what other processes may be lurking in the background that really are potentially mirrored by monitoring data, and a part of the reality that we're dealing with, that this approach to this point is not dealing with.

A second point that I will make, if I can get my cursor to move, is that I think there are really important differences in the temporal patterns of concentrations in rivers and streams as opposed to reservoirs.

And there has been some mention made of this particularly sensitive to this because that's what we primarily look at.

The reservoir model doesn't really do a good job of mimicking the temporal signature of concentration patterns in rivers as it unfolds day to day.

I think that average concentrations may be somewhat higher in drinking water drawn from rivers than they are in drinking water drawn from reservoirs given this kind of difference in pattern simply because the residence time in the river is likely to be less than the residence time in the reservoir.

And therefore, there is less time for natural degradation processes to cut down the concentrations.

Certainly, the day-to-day variability would be higher in the rivers. If the health effects are determined really only by medium to long term average concentrations, then they this may come out in the wash. It may not be an important point at all.

But if fluctuations in exposure from day to day or something semi acute in the response system is important, then the current approach really doesn't do an adequate job of reflecting the reality of rivers and streams.

And while no one probably would claim that it did, it reflects a need to develop further modeling approaches to deal with that end of things.

I guess the final comment that I would raise is, again, it has been somewhat touched on by some of the other respondents, I'm just curious how OPP believes the PRZM/EXAMS index reservoir approach

compares to what would really be present if you could actually go out to that same hypothetical reservoir and that same soil type and do the monitoring there.

We recognize that we're dealing with an unrealistic situation.

But most of the discussion seemed to focus on, well, we feel pretty comfortable because the high concentrations that we see in monitoring are about the same as the high concentrations we see in modeling.

But I'm curious about what about the whole range of concentrations. There are several aspects to the structure of the PRZM/EXAM assumptions that I would expect would lead to conservative estimation, to a higher average concentrations, for example, than would occur in that system if it was really monitored.

Particularly, I'm thinking about the fact that you have 100 percent delivery of everything that comes off the field right into the reservoir with no opportunity for capture along the way in the stream system or degradation, whatever.

So I think it is important not only to be concerned about whether we are unpredicting, but also -- underpredicting, but also to be concerned about ways in which we may be overpredicting the concentrations that would exist in that very system that we're tempting

to model.

I don't pretend to know how you evaluate that, particularly when you are not modeling a specific system that you can go to. But I think it is important thing to look at from both sides of the coin.

And with that, I'll pass.

DR. KENDALL: Thank you. Dr. Bull, do you have any further comments?

DR. BULL: I'm not sure how much I need to add. In fact, I'm not that familiar with the modeling. So I could excuse myself from that.

But I do on the bottom line kind of agree with the assessment that drinking water would be a minor source of organophosphorus pesticides, that I don't think carries over to other pesticide classes necessarily.

There are some other issues, and it just happens, I think as you said, it's fortunate you started with the OPs.

And I was also going to -- I'll just indicate, bring up this issue that Dr. Richards brought up to some extent, and that is, I see any impact of organophosphorus pesticides in drinking waters to be very rare events.

What I would like to know is if I could get a handle on it is how

frequently I could expect that event to occur. And I don't think -- you may be able to find in some cases at least some idea what the concentrations actually are in those situations, but I would be actually more interested in how often those spills or whatever they are, the genesis of that.

Because if there is a hazard in drinking water, it is going to relate to that kind of activity, I think. The rest of it, I think, is just going to kind of go away.

There are imbedded in that also some questions I think that you purposely avoided in this particular, and admittedly so, in this particular analysis.

And you live in an agricultural area, you see some practices that go in a particular demographic group, such as farm workers, and you think, well, it is probably easier to get a drink of water out of the irrigation ditch than it is to go down to -- you know.

So there are some other exposure scenarios that play out on an individual basis. Very small part of the population and so on and so forth we should have some concerns over, but I don't know that it is even possible to capture that with the data, the information you have to date.

I have to admit it was a little hard for me to figure out how you

ruled out certain things looking at the write-up. I don't know if some clarity can be added.

It just kind of like made the conclusion. I couldn't tell why you came to that conclusion. I have to say in most all the cases your presentations clarified that pretty nicely. I was a little left up in the air in some of those situations.

The one thing that I touched on in my earlier questions, and I think you were alluding to as well, is the heterogeneities in those regions are just huge. I mean, I think there is more variation in your fruitful rim in terms of weather pattern and agricultural practices than there may be across the United States. Or as large as. I guess it can't be larger.

But those regions are not very comforting to me because of lot different -- very different geography, very different distribution of crops within those regions.

Some of them are quite concentrated. The apple are not grown throughout Washington. They are grown right on the river or on some of the streams, whereas wheat is all over the place.

So you get a little uncomfortable when you come back and then play that against this -- the one problem I have with the reservoir, we'll come to that in a minute, is that trying to play that out all in one

reservoir to capture that whole region bothers me for that reason.

Because I think if you had a reservoir, it is more likely to be in an apple growing area, getting stuff from treatment of apple orchards in one case. I think you get real variation, which I don't think you capture terrifically here at least.

The other thing I got acquainted with, the naqua (ph) study that was done in the Saint Anna (ph) river, was very impressed with the kind of work there. There was nothing in that naqua study that would indicate that there were dangerous levels of organophosphorus pesticides or any other pesticides.

But it did make real clear some of the points that you raised in terms of, well, some of that comes from agriculture. Some it comes from residential run-off.

Residential run-off in that area depends on which way the rain is coming from.

So you get even in a small area like the Saint Anna watershed. You have heterogeneities that have huge influences on what you're seeing in the river.

So you have a lot of work to do. I don't know how much effort is -- I'm talking about a huge amount of effort. I don't know how much effort is really warranted considering the fact that it is probably

a minor input.

Probably the -- I'm not unhappy with the reservoir work because I think the small reservoir (inaudible). But to be more realistic, you need to really get to the question.

I think the getting at the question the way you did when I asked the question earlier about the stream, why did you have values higher than expected was a very good way to approach it on a case-by-case, I can explain this because that's not a water supply.

But if you are really going to do this on a real cumulative risk kind of area, you really need to find a way of getting a lot more realistic relationships to the water intakes.

There is no surface -- particular surface water sources in the Columbia river until you get to where I live. And we have a population there that's fairly substantial in the tri cities. There are 150,000 folks. And we're mostly on surface water. We drain the Acomaw (ph) River too.

So if you had a surface water impact, it may not be in the Acomaw River. It may not be further upstream or in the apple growing region. It might be in fact down where we are on the Columbia.

And so there is some unreality or discontinuities, I guess, here that bother me a little bit.

But anyway, I think you have done a wonderful job with what you have at hand. It may be because it reinforced my prejudices.

DR. KENDALL: Thank you.

Any further comments from the panel?

Dr. McConnell?

DR. MCCONNELL: Yes. Thank you very much, Ron.

I have -- possibly it's from my naivety, but first, you've to herculean efforts in pursuing this. And you did essentially, I think, what the SAP asked you to do.

I followed the logic. And I thought it was reasonable logic in the steps you took.

But my question goes to some of the comments I think Chris made, Steve, Dr. Richards.

This seems like an awfully complicated way of getting to the truth, the truth being how much, how many OPs and what level are there in the water that we consume.

So I guess I would go back to this statement that while you have gone through this and you will have to go through it because of the limited amount of data that you have, I would like to see the agency pursue finding out what really is in drinking water.

Why can't you go to distribution centers and do the same

analyses you are doing on the streams? Is this such a horrendous task that it is not possible?

Certainly, you would focus first on those areas where you have the most OPs. Second, you could take one of those, and if you see in your largest contaminated areas that this is not a problem in the water that we drink, then I think you can assume in areas that don't use OPs that, similar type of logic that you have used, that you won't have any in that water or not a significant amount.

So it is not clear to me why we can't go right to the source of the drinking water and analyze it for OPs rather than going through this complicated exercise of modeling.

And while I was -- if I were doing that, I would take a look at some groundwater, particularly, in single aquifer areas, and see if there are indeed OPs in that water or not.

And if there are, what levels and what kinds and so forth. And then if there aren't there, you can at least be assured that this is not a problem for those sorts of areas.

Now, with that, how would you go about that? Evidently, this is a big time project, what I'm talking about. I don't know.

But it sounds like from what you have said that that is a problem. I'm wondering as a biologist if there isn't some way of

finding a generic assay for OPs. I don't know if there is or not. That's why you have ORD, as I understand it, is to pursue some of these problems.

There might be some simple biological system that you could put water into and see if OPs are in there or not, generically.

If they are not there, you don't go any further. If they are there in significant amounts, then you would want to find out which ones they are and whether the more potent ones are not.

I don't know if this is possible or not. But I would think the agency might want to spend some of its resources in this area because it certainly would be -- it wouldn't be a guess. And it would be right on the money.

Feel free to respond.

MR. THURMAN: One quick thing. I know that a number of OPs in OP transformation products are on the unregulated contaminated monitoring list, the new lists that have been coming out last year, this year.

I think that in the future that at least for some of them there will be more drinking water data for these.

DR. MCCONNELL: What is the problem that they are not being analyzed? Again, help me here. It is not clear to me why this wouldn't

be one of the things that people that analyze water would be analyzing for.

MR. THURMAN: I think the fact that in -- historically, OPs have not been identified as the most likely to contaminate surface water or groundwater.

It means that resources haven't been directed that way as much recently. I believe that in studies further back when the OPs were new, '50s and '60s, to the extent that anybody looked for anything back then, they were much more included, but in talking to the states, I know that what monitoring money they had was most often directed toward looking for herbicides because they are much more likely to get into drinking water and because they had mandates to look for some of them.

DR. MCCONNELL: And I accept that. But since OPs are on the table today and since they are apparently an important consideration in the cumulative risk of OPs, then I would think you could take 10 reservoirs in the most contaminated, OP contaminated areas of this country and you could look at the water that is coming out of a distribution center, for just those 10, and you would find out very quickly whether you have a problem or don't have a problem.

Am I missing something here?

MR. COSTELLO: You start running into -- even if you focus on 10 reservoirs, how frequently do you sample.

I think part of what we're finding is, it hasn't been done because there is a cost basis there that is a lot higher than a lot -- because I think there was -- when we first started doing these assessments, we said, let's just monitor for this.

And as we started looking into the feasibility of setting up a monitoring system to pull together the data that would give us the answer to the question we did, we started realizing the expenses started getting --

DR. MCCONNELL: Well, that's an answer.

MR. COSTELLO: -- astronomical.

DR. MCCONNELL: That's an answer. But I'm wondering if -- again, while that's -- I'll take your word for it that that would be an expense for 10 reservoirs.

Reservoirs don't turn over that often. Particularly major reservoirs. Not like a stream --

MR. COSTELLO: The other thing I would add is the idea of the pilot monitoring study that USGS did was to start getting at some of those questions.

This working group that Mark Russell mentioned looking at

national monitoring is trying to get at some of those things. And we were looking at pesticides in the future.

It was not lost on us that -- there was a good reason from our point of view on water that OPs came first, because that's gives us a chance to work, refine our methods and ask some questions and poke around so that the next generation --

DR. MCCONNELL: Plus, they are important pesticides. And there is a lot of them out there. I can understand why you would focus on those.

Again, I make a plea that you talk to somebody at ORD and see if they might want to look at finding an assay that is inexpensive and quick.

If you put a little brain power on it, you might be surprised what you come up with.

Thank you.

DR. KENDALL: I think they heard you, Dr. McConnell.

DR. MCCONNELL: I hope so.

DR. KENDALL: Any other questions or points?

Dr. Portier?

DR. PORTIER: I have two points.

First, I want to agree that you have done exactly what we asked

you to do when we looked at this model.

I'm not sure we'd ask you to expand it beyond a screening level model for cumulative risk assessment. But I think your attempt to do that has been valid and an exceptional effort on your part.

When I looked at this question, I actually had a real problem with the question. That's why I kept pestering you, asking you about the issue of maximum values.

The real issue here is underestimation of what. Underestimation of the mean? I doubt it.

I think when people talk about you being conservative and they are fairly happy that you have done this and that it is a fairly safe estimate of water exposure, I agree that -- I would love to see the monitoring data.

I'm not convinced. But let's say that my intuition says that you are in fact fairly conservative with this model for the mean.

Now, what about a 21-day drinking water exposure in a rural population from a small reservoir in a local drinking source? Are you going to be conservative to that? Is that what you want to be protective of?

And that was my problem in why I was asking you all these questions. I don't know where your underestimation, overestimation

will be. At some point you will obviously be below a percentile in the distribution of water exposures in the United States for 21-day phases. I couldn't make that judgment.

So that's, I think, something you have to ask yourself as you look at this, is what degree of conservativeness are you actually trying to achieve, and can you demonstrate that to me scientifically.

The other question, and regretfully since I won't be here tomorrow, I'm going to take it here, but it pertains to all the sources of exposure and to the overall cumulative risk assessment as it is done.

Centers for Disease Control has obviously looked at human urine levels from exposure to organophosphates in a random population exposure.

To what degree do those numbers from those urinary outputs and back predictions of what the exposures might have been from those urinary outputs compare against the distributions you are predicting for exposure in the population in the United States?

Are they agreeable? Are they not agreeable? So that's a question on the exposure side that I would have liked to have seen addressed in this overall risk assessment. That's a very critical piece of data if you can pull it away from CDC.

The second part of that, though, is we've got a lot of animal

data where we could potentially predict tissue level or urinary output from the animal.

How does -- so regardless of the exposure as you estimated in the U.S. population, how does urinary output distribution as seen in the U.S. population from the CDC data compare to urinary outputs in the rodents at the levels at which they were producing 10 percent or 5 percent reduction in cholinesterase activity.

I think you could ask those two questions and assure yourself from the CDC data that potentially you are doing a good job of protecting the population if neither of those two things raise a big flag for you.

But I would like to see that in the overall evaluation of the exposure data and the risk data.

DR. KENDALL: Any further comments for Question 1 from the panel?

Let's move to Question 2.

MR. THURMAN: Question 2. It is not feasible to conduct drinking water assessments for every watershed in which OP pesticides are used.

Therefore, regional water exposure assessments were used to represent exposures from typical OP usage conditions at one or more

vulnerable surface watersheds in the region.

Each regional assessment focuses on areas where combined OP exposure is likely to be among the highest within the region as a result of total OP usage and vulnerability of the drinking water sources.

In this manner, OPP is confident that if the regional cumulative risk assessment finds that exposure in water is not a significant contributor to the overall OP exposure in that area, it will not be a significant contributor in other areas in the region.

Does the SAP see anything that would call this assumption into question? If the regional approach with its assumptions is inadequate, what can be done to improve the approach?

DR. KENDALL: Thank you.

Dr. Richards, can you lead off, please?

DR. RICHARDS: Thank you.

I guess -- I think the assumption that the regional assessment is protective of the region as a whole is going to be largely valid. And I would expect that, if there are exceptions, they will be relatively minor.

I can think of a couple situations which may suggest a greater likelihood of such exceptions. And these would typically involve small surface water systems perhaps involving a component of the

heterogeneous application that people have alluded to, quite possibly small rivers or streams, perhaps private sources that are serving less than 25 people so they don't qualify as a public water supply, or the other possibility would be something unmodeled like the spills that I was referring to previously.

I think in the overall picture, these represent a level of reality that may be essentially impossible or impractical to model. And maybe even impractical to try to manage. But I think they do have to at least be acknowledged.

I think by and large for the kinds of systems that service most of the people, the assumption that the regional assessment is protective would be valid.

I only have one other point. And it goes back a little bit to my comments previously. I certainly understand and sympathize with the need to be conservative in estimating exposures through any of the pathways considered in the assessment. And I think you have done a good job with that.

But I also would ask particularly when you take this index reservoir and you consider it as a surrogate for all the drinking water sources in the region how strongly conservative do you think it is.

Let's say it provides a fairly reasonable estimate of the situation

for the worst water supply in the region. Is there going to be a percentage of water supplies which have a concentration distribution that's an order of magnitude lower than that or two orders of magnitude lower than that?

I would expect there would be a number of systems that have lower concentrations. But by how much, I haven't a clue. And I think some attempt to estimate the degree of conservatism is useful both from the standpoint of seeing how protective you are being and also just for increasing the reality of the assessment.

I suspect that, and most people have already alluded to, for the question of the OPs in particular, the drinking water issue seems to be a relatively minor one. So if you are two orders of magnitude high, no one really cares.

But for other future uses of this kind of an approach, this may be a much more important kind of thing to get a handle on.

So it's really a question in this case of the distribution of concentrations from site to site within the region and how that compares to the distribution you predict from the worst case model.

DR. KENDALL: Thank you very much.

Dr. Bull?

DR. BULL: I don't have too much to add to that. I actually

made most of my points in the last question. But I will kind of go back over the issue of heterogeneity.

I'm a little bit worried about how representative the one or two locations are within each area. And I don't know or didn't gather how, what you did to try to confirm that was representative, I guess, because I -- you mentioned weather and a few things like that.

And I'm aware of the heterogeneity of crops at least in certain parts of the country that I don't feel are well captured.

So I'm a little bit worried about the representative nature of it, even of the worst case.

But all in all, I think what you did was kind of the pragmatic thing to do, so to speak.

DR. KENDALL: Thank you.

Dr. Engel?

DR. ENGEL: I too would agree that in general your assessments should be fairly conservative for the region as you have performed those.

A couple of items that I would point out related to this.

One, you lead this question off with a statement, It is not feasible to conduct drinking water assessments for every watershed in which OP pesticides are used.

That may have been true a number of years ago, but I think that assumption or that statement is not as true as it once was.

With some of the spatial databases and other databases that are now available, one can automate and step through again with assumptions modeling of most all of the watersheds, if not all of the watersheds, within the country.

I know our group has been using a model similar to PRZM. We have stepped through every 100 meter grid cell in the state of Indiana again with assumptions and pulling data from databases to build up runs that would be comparable to what you are doing.

So with a little compute time and with the right databases sitting behind this, I think that assumption begins to potentially go away.

So I think longer term you may want to think about how you potentially could run for more watersheds.

The one other comment I have related to this, in the documentation, I think you have done a commendable job in highlighting assumptions that you have made and how those come to play in some of this.

I guess I would ask if you would look at those again and make sure that you have explicitly documented the significant assumptions

that you are making with respect to some of this and make sure that those get documented.

So what was there was very helpful. But please review those and make sure that there are not other significant assumptions that should be documented.

DR. KENDALL: Thank you.

Dr. Capel? Anything to add?

DR. CAPEL: Thanks.

A number of the places in the document you make the statement that drinking water is local and that modeling should be done or assessment should be done at the local level. And for practical reasons you went up to a regional level.

And that disconnect is still there. The approach you have taken where you have picked the most vulnerable area and called that protective is again probably okay for the organophosphates, but as we move on into the future, this disconnect between local water use and kind of regional modeling or, well, the heterogeneous areas probably is not going to be adequate.

Is it protective? Yes. I would make one, raise one question. And that is going back to the transformation products.

We know that some of the auxins are perhaps more toxic than

the parent compounds. And so one can play simple mathematical games by asking themselves if the degradation products are there at a tenth of the parent concentration or equal to the parent concentration, when do we start losing our margin of protectiveness and how important are these transformation products.

And so I think doing those sort of scenarios might help firm up or erase questions about how protective the modeling efforts are. Because I think, again, it is an important piece of the puzzle that isn't adequately captured.

DR. KENDALL: Thank you very much.

Any further comments from the panel on this question?

Dr. Bull?

DR. BULL: Just to reinforce his last point, I think in the case of -- there is the concern on the OPs, but I think you really need to pay attention to this transformation of pesticide residues in water treatment.

That's going to become an issue. You have nitrosamine forming pesticides and so on and so forth that have been documented.

And then you are talking about something that is -- that kind of drives a risk in a whole different direction. So I think that particular area should not be thought of only in that context of the OPs.

DR. KENDALL: Thank you. Any further points?

Would EPA care to respond to any of the recommendation or issues?

MR. COSTELLO: Actually, we want to thank the panel for your recommendations to help us in terms of improving what we're doing both for this and for future ones.

DR. KENDALL: Thank you.

MR. THURMAN: The one thing we do want to add, because the issue did come back up in terms of residential use, is that with particularly chlorpyrifos and diazinon cantholtis (ph), you've knocked out your major residential use OPs.

MR. COSTELLO: And the other one that was a major one that we saw was malathion, which by relative potency factor had such a low relative potency factor that it knocked it out too.

Not taking those, chlorpyrifos and diazinon, from residential sources into account, this is why they didn't drive where -- those uses did not drive where we placed our watersheds.

MR. THURMAN: At the same time, you did point out -- by raising those questions, you pointed out areas where we need to be more clear and transparent what we have done in that.

MR. COSTELLO: But also, as you say, maybe that was just

another bit of luck for us with the OPs that those very important uses happened to be canceled.

Well, they didn't happen to be. We were voluntarily canceled.

DR. KENDALL: Okay.

Then this will close our responses to this question.

I think it has been a good day. We have been through both the food and drinking water. I personally compliment the agency in, I think, doing a remarkable job at responding to the recommendations of the SAP from our previous meetings. And particularly from the last meeting.

I appreciate the panel's work today. You were very well prepared. It was obvious. And I thank you for that.

The audience has been extremely patient with us. We have had challenging, other activities in the building. And we got through it together.

We are approximately a half a day ahead of schedule now. And Mr. Dorsey and I have talked. Mr. Lewis and I have talked.

I will close the session in just a few minutes, don't leave yet, this afternoon.

Margaret Stasikowski, do you want us to proceed with residential? You guys look a little tired over there too.

What would you like us to do?

MS. STASIKOWSKI: I think we would like to do the residential assessment starting tomorrow morning.

DR. KENDALL: Okay.

As I mentioned, because of our progress yesterday and in due process and good deliberation, we made good progress, there was the potential to finish the meeting tomorrow evening.

I think that potential is quite excellent. So at this point, we have the residential section as well as the risk characterization section to do.

And with a cooperative panel in good spirit, that perhaps could be achievable. Mr. Dorsey asked if we could at least attempt to do that.

But we will not cut short the discussion at all. Okay?

As has been our customary procedures, we rotate and help each other. Dr. Roberts will move to session chair in the morning to take over with residential.

We agreed that I would get us through drinking water and then he would take over with residential and finish with risk characterization.

So anyway, he will move to session chair. I'm not abandoning

the ship, but moving more to the rear. So anyway, Dr. Roberts will move to session chair.

Other than that -- Dr. Portier, did you have a comment you wanted to make?

DR. PORTIER: Yes. Again, I will be leaving after today's session. So I will not be here tomorrow. Don't everybody smile. That is why he is saying we'll be finished early tomorrow.

But I do want to reiterate the point that I commend the agency for an excellent series of presentations.

As a quantitative scientist sitting on the EPA science advisory board, for years I have been fussing at you about the quality. And this particular time I have seen exceptional quality in the work that is done. I have a clear understanding of how you did it and the assumptions made in making your choices. And for 99 out of 100 of the choices I agreed with them.

I really do want to thank you for the excellent presentation and some excellent work on behalf of the public of the United States.

Thank you.

DR. KENDALL: Thank you very much, Dr. Portier.

I particularly wanted to acknowledge Ms. Mulkey for staying with us almost all day. This is unbelievable that she could give so

much time to help this panel and contribute to it.

So I personally believe your presence and engagement was an asset. And thank you.

MS. MULKEY: Thank you. I appreciate the preparedness of the entire EPA group today. That's one of the reasons we're ahead of schedule, I think, good preparation. The panel was prepared. It is amazing what people working together can achieve.

DR. KENDALL: This will close our session today. Thank you very much. We will reconvene at 8:30 in the morning.

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[Whereupon, at 4:45 p.m., the meeting concluded.]

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I, Frances M. Freeman, Stenotype Reporter, do hereby certify that the foregoing proceedings were reported by me in stenotypy, transcribed under my direction and are a verbatim record of the proceedings had.

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EXHIBITS:none

TRIAL DATE:

**SIGNATURE: n/a