MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

SCIENTIFIC REVIEW PANEL

SHERATON GATEWAY HOTEL

6101 WEST CENTURY BOULEVARD

LOS ANGELES, CALIFORNIA

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9:30 A.M.

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APPEARANCES

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Dr. Paul Blanc

Dr. Craig Byus

Dr. Joseph Landolph

Dr. Charles Plopper

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Ms. Sheryl Beauvais, Ph.D, Staff Toxicologist(Specialist)

Mr. Parakrama "Gura" Gurusinghe, Ph.D, Associate Environmental Research Scientist

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Ms. Lori Lim, Ph.D, Staff Toxicologist

Mr. Randal Segawa, Agriculture Program Supervisor

APPEARANCES CONTINUED

REPRESENTING THE OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

Mr. Andrew Salmon, Ph.D, Chief, Air Toxicology and Risk Assessment Unit

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PROCEEDINGS

CHAIRPERSON FROINES: Let's call the meeting to order. Is this working?

So we will officially call the meeting of the Scientific Review panel on Toxic Air Contaminants open. And it's June 26th, 2006.

The first item on the agenda is the continuation of the panel's discussion of its draft findings based on the Report Sulfuryl Fluoride Risk Characterization document.

I'm not quite sure how to proceed. Roger and Craig were the leads and so maybe we should start with them giving us any update that they would like to make and then we'll go around. I actually sent Emails around this weekend about one problem, and so I have a suggestion, but we can come to.

PANEL MEMBER ATKINSON: We had a number of -- or a couple of sort of conference meetings, conference calls including Jim Behrmann from the ARB. And we revised the previous findings to take into account as fully as we could the comments from the last meeting of last year. There it is.

PANEL MEMBER BYUS: I think we used a combination of my notes, the transcript, Jim's notes, which there was a rather lengthy discussion. And we tried to piece all of

that together and try to make the new findings. We modified the findings. We also added things to the actual report as well in response to that lengthy discussion. So that's what we did.

And I think, Lori, is here and she -- you have some PowerPoints, do you not, about --

PANEL MEMBER BYUS: She's summarized them.

CHAIRPERSON FROINES: At this point, I would prefer -- I talked to Lori ahead of time, and I would prefer that the Panel discuss the findings. And I don't think we need Lori's input at this point. This is, at this stage, an internal issue rather than an external one, unless the Panel would like to see Lori's PowerPoint slides. What's your inclination?

PANEL MEMBER BLANC: No, I think let's go forward with the discussion. Paul Blanc here.

I would say, just to clarify, I think what you intended in your comment was to say that DPR in response to your input modified its report.

PANEL MEMBER BYUS: That's correct.

PANEL MEMBER BLANC: Okay.

PANEL MEMBER BYUS: Well, in response to the discussions of the Panel and our sort of clarifications, they modified the report.

PANEL MEMBER BLANC: And then your findings

reflect their original report and their modified report.

PANEL MEMBER BYUS: That's correct.

PANEL MEMBER BLANC: So that everything is consistent.

PANEL MEMBER BYUS: Correct.

CHAIRPERSON FROINES: And I think what Paul is getting at is that you are comfortable with the changes that DPR made in the report. And so that a revisiting of the report you think is not necessary at this report?

PANEL MEMBER BLANC: Right. And I would say that the findings -- you know, the bottom line of the findings is that this is clearly a Toxic Air Contaminant by all of the criteria upon which we assess such things, and that the report was convincing in that regard. And I think that since that's the major issue, I think the findings, as summarized, are very straightforward.

I think that because of the complexity of the technical aspects, which include the parent compound and then the side issue of fluorine exposure, I think that, you know, organizationally it can be a challenging set of findings. And I think you've taken the route of being quite expansive in the narrative rather than some of the findings that we've had that have been more terse. And I think that that opens it up for more potential editorializing.

So I think that the big question is assuming that there's a consensus that the principal findings are very convincing and that there might be some room for editorial streamlining, I think we've faced that before in the Panel, where we've given guidelines to our Chairman or working subcommittee with the Chairman to make those final wordsmithing changes and then circulate a tentatively approved document without delaying the approval of the findings, would be the kind of route that I would suggest for this. Rather than spend a lot of time, you know, talking about word choices, because it's a very wordy set of findings. I know Joe you circulated an Email with some suggestions. And John 2 days go you suggested some other logical reorganization, but that wasn't really -- I didn't read your Email as questioning anything fundamental about the --

CHAIRPERSON FROINES: No.

PANEL MEMBER BLANC: So that's the route, personally, I would recommend. But I think it would be easiest firs -- well, most logical first to come to some sense if there's a consensus that people do think it was convincingly summarized as a Toxic Air Contaminant.

CHAIRPERSON FROINES: Joe.

Bill, can you basically do 2 things. One, let's deal with what Paul's put on the table and address that

question, namely, are you convinced in terms of its recommendation of it being a Toxic Air Contaminant, and secondly then that we approve these findings and let me wordsmith a little bit to bring it to final closure.

PANEL MEMBER LANDOLPH: So let's see. This is Joe Landolph.

PANEL MEMBER LANDOLPH: Yes, I certainly agree it should be considered a Toxic Air Contaminant. I don't have any doubt about that.

And I think the document has been well worked by Roger and Craig. And they also -- Lori and the others also put substantial effort in to the 10 pages of comments I sent earlier, so it's a pretty good document.

And then the other question was -- what was your other question John?

PANEL MEMBER BLANC: Mechanistic.

PANEL MEMBER LANDOLPH: Oh, mechanistically. Yeah, it looks like a Toxic Air Contaminant to me from --

CHAIRPERSON FROINES: No. No. He meant the process, not that the chemical mechanism works.

PANEL MEMBER BLANC: No, the final wordsmithing. Tentative approval --

PANEL MEMBER LANDOLPH: On our findings?

CHAIRPERSON FROINES: Yes.

PANEL MEMBER LANDOLPH: Yeah.

CHAIRPERSON FROINES: Well, we'll go through your comments in a minute. What Paul said is since there can be some minor changes to what is in this document, is the panel comfortable if I make some small wordsmithing changes, some changes and then send a draft around, rather than spend hours going through the document itself.

PANEL MEMBER LANDOLPH: Oh, some small wordsmithing changes to DPR's document?

PANEL MEMBER BYUS: No. No, our findings.

PANEL MEMBER LANDOLPH: You've got my comments.

CHAIRPERSON FROINES: I think you should raise your comments because they were substantive.

PANEL MEMBER LANDOLPH: Okay, whenever you like. Otherwise, I agree.

CHAIRPERSON FROINES: So, Charlie, is the approach Paul is suggesting okay with you?

PANEL MEMBER PLOPPER: Yeah, its fine with me.

CHAIRPERSON FROINES: Craig.

PANEL MEMBER BYUS: Fine. It's wonderful.

PANEL MEMBER ATKINSON: Fine.

CHAIRPERSON FROINES: So I don't know if -- Joe, why don't you give us your comments.

PANEL MEMBER LANDOLPH: Sure. One is a year old comment that you had asked me to deal with about a year ago, which was to try and deal with that issue of the

carcinogenicity of fluoride, the metabolite of sulfuryl fluoride. So I just recommended a short sentence, which I Emailed to everybody, to you and Craig said it looked okay to him. I recommend some wording along the lines of, fluoride, a metabolite of sulfuryl fluoride, is clastogenic and can induce osteosarcomas in male rats. There is some conflicting evidence that fluoride in the drinking water correlated with an increased incidence of osteosarcomas in male humans." The epidemiological data was conflicting. The animal data is even a little bit -- it's a little bit conflicting. It's not perfectly consistent.

PANEL MEMBER BLANC: Joe, is it an IARC 3 or 2B or --

PANEL MEMBER LANDOLPH: That's a good question. I don't know the answer to that.

CHAIRPERSON FROINES: Paul, Peter just said that people can't hear.

PANEL MEMBER BLANC: What's the IARC, because I think that the sentence needs to end, you know, with a semicolon. It is an IARC.

CHAIRPERSON FROINES: I'm sorry Lynn or.

ARB AIR POLLUTION SPECIALIST BAKER: We can hear some but it's hard to hear the rest.

PANEL MEMBER LANDOLPH: Yeah, I didn't find that

IARC data. I didn't go looking for it either, so you raise a very good point.

PANEL MEMBER BLANC: I mean if the sentence is -- I don't have any problem with the sentence, but I just think it should say one way or the other, because -- otherwise people are going to be doing what I'm doing, which is saying does that make it in the IARC data?

PANEL MEMBER LANDOLPH: Yeah, fair enough. I don't know if Lori had looked into that.

DPR STAFF TOXICOLOGIST LIM: Lori Lim, DPR. I'm actually looking at my document and I don't have any indication what the IARC classification is in the beginning part. So let me see real quick.

CHAIRPERSON FROINES: Well, Joe's opening a little can of worms in the sense that he -- Lori, he's saying the following, "Fluoride a metabolite of sulfuryl fluoride is clastogenic and can induce osteosarcomas in male rats. There is some conflicting evidence that fluoride drinking water correlated with an increased incidence of osteosarcomas in male humans."

My question for you is, is that finding that he's recommending, is that consistent with the language in your document?

DPR STAFF TOXICOLOGIST LIM: I do not exactly use the word "conflicting". I merely presented the thesis

finding, which was saying that there was an association between fluoride in the drinking water and also sarcomas in the young boys. The way it's in Douglas's letter to the editor, he implied that there is no correlation, but we have not seen the final, his published study. So I couldn't really weigh them equally to say it was conflicting, so that word was not used in my document.

CHAIRPERSON FROINES: You're answering a question I'm not asking. Let me -- what I'm asking is what Joe has proposed has to have -- has to derive from a section in the document, so that his statement is consistent with what is stated in the document.

PANEL MEMBER BLANC: I think she just said that they do discuss --

CHAIRPERSON FROINES: They do. No, I've read it. But I'm just wanting to make sure that Lori is comfortable with what she's written relative to what Joe's suggesting. That's all.

DPR STAFF TOXICOLOGIST LIM: I would agree that it could be classified as conflicting, the fact that they do not have the same results.

PANEL MEMBER LANDOLPH: I tried to make my statement very conservative to be consistent with what she wrote.

(Laughter.)

CHAIRPERSON FROINES: So as far as you're concerned, what Joe's proposing is consistent with what you wrote in the document?

DPR STAFF TOXICOLOGIST LIM: Yes.

PANEL MEMBER LANDOLPH: John, also that statement -- Lori, correct me if I'm wrong in error -- but my understanding is that statement I wrote is intended to be consistent with what the NAS assessment of the fluoride document is.

DPR STAFF TOXICOLOGIST LIM: Yes.

CHAIRPERSON FROINES: I'm just worried about consistency. That's all

DPR STAFF TOXICOLOGIST LIM: Yes.

CHAIRPERSON FROINES: And so go ahead, Joe. So we'll -- is the panel comfortable with that inclusion?

Joe.

PANEL MEMBER LANDOLPH: I'm happy with it, since I wrote it.

(Laughter.)

CHAIRPERSON FROINES: No, no, no. Moving on.

PANEL MEMBER LANDOLPH: That answers your question.

PANEL MEMBER BYUS: Moving on, Joe.

(Laughter.)

PANEL MEMBER LANDOLPH: Okay. Now, that you've

moved us on. And then the other comment I had was one I made about a year ago at that last meeting. I was a little bit worried looking at some of the dissipation data, which is very nice data, in the document from DPR. It looks like it takes almost 4 days for the sulfuryl fluoride to dissipate down to background levels.

And so I drafted a sentence which you may modify or reject as you like. It reflects my thinking. The sentence reads, "Due to the neurotoxicity of sulfuryl fluoride and the possible carcinogenicity of a metabolite, fluoride ion, it is recommended that residents of treated homes not enter the homes until 4 days after clearance of sulfuryl fluoride."

CHAIRPERSON FROINES: Let me tell you the problem that I have --

PANEL MEMBER LANDOLPH: Okay. Let me give you one more thinking --

CHAIRPERSON FROINES: Go ahead.

PANEL MEMBER LANDOLPH: -- then I'll be delighted to hear your question. I'm concerned that there's no health benefit to this compound for the people. So I'm concerned that I don't want to see people accepting an additional potential toxic risk, particularly if this is a possible carcinogen, when there's no risk versus benefit to gain for them. So that's where my thinking comes from.

And then you had another question.

CHAIRPERSON FROINES: The problem I have with this is I agree with the sentiment, but this is what -- you're talking -- what you're proposing is basically a risk management statement, which doesn't really fall within the purview of this panel. So for us to recommend 2 days, 4 days or a year, whatever, really is what happens as a result of our finding this as a Toxic Air Contaminant, which is DPR's mandated role.

So I think that whereas the spirit is reasonable, it seems to me that I'm not sure we can really put this in this form.

PANEL MEMBER LANDOLPH: Okay. Well, I'll defer to you. You know these procedures much better than I do, so if that's how you view it, that's fine with me.

CHAIRPERSON FROINES: I don't think we generally have put in recommendations about control strategies is what this really amounts to.

PANEL MEMBER BLANC: Yes. What you could say, if -- in your reading of the document if everybody thought it was there, is that if the finding was that there appears to be a distinct time cutoff, there's a suggestion with a distinct time cutoff point of 4 days which should be, you know, taken in to account in risk assessment. That, one could say, if that's what the data has

consistently suggested, that there was some kind of steep fall off after 4 days, and that there's a difference after 4 days, if that's in the document. But I fully agree with what you said, I don't think it's appropriate to say there should be, you know, some kind of -- that's up to ARB or whoever.

CHAIRPERSON FROINES: Well, that's a question that is there. I mean, if I understand what you're saying, if you have -- if the concentration is like this and then drops off, if that's in the document, then we could note that.

PANEL MEMBER LANDOLPH: Yeah. A number of graphs are.

PANEL MEMBER ATKINSON: But it doesn't.

CHAIRPERSON FROINES: Well, that's the question.

PANEL MEMBER LANDOLPH: What did Roger say?

PANEL MEMBER ATKINSON: I mean it decreases in something like an exponential amount. So there's no sudden steep drop off.

PANEL MEMBER LANDOLPH: It looks more asymptotic. Almost sigmoidal in its increase, so it is asymptotic.

CHAIRPERSON FROINES: Well, so then having a sentence that says 4 days -- in other words, what's -- going back to Paul's comment, what is the -- is there a statement that could be made that -- you could take

Roger's statement that the fall off appears to be exponential and then what?

PANEL MEMBER LANDOLPH: And it's approximately at background levels by day 4 after fumigation.

PANEL MEMBER ATKINSON: I mean if you were to do it that way, presumably would have to set a limit for the concentration rather than the time. That would seem to be the obvious one if you were wanting to pursue that sort of approach. But if you look on page 38 just looking at Volume 2, it's essentially an exponential decrease approaching, at least in the particular graph I'm looking at, approaching 0 after about 5 days.

CHAIRPERSON FROINES: It's -- what's the table?

PANEL MEMBER ATKINSON: It's Table -- Figure 5.

CHAIRPERSON FROINES: Figure 5.

PANEL MEMBER ATKINSON: It is the predicted best bunch of numbers.

CHAIRPERSON FROINES: Page what?

PANEL MEMBER ATKINSON: It's page 38.

CHAIRPERSON FROINES: And what --

PANEL MEMBER BLANC: Volume 2.

CHAIRPERSON FROINES: Volume 2.

PANEL MEMBER ATKINSON: I mean, that's expected to be and it appears to be generally an exponential decrease.

CHAIRPERSON FROINES: So if I put in a sentence -- if I put in something after that that says the drop off -- using better language -- but the drop off appears to be exponential achieved and background level -- and approaching background at 4 days, is that --

PANEL MEMBER LANDOLPH: Yeah, that would do it. That would convey the spirit of the thing. Are you comfort -- because that we can put in?

PANEL MEMBER LANDOLPH: Sure, that's fine.

CHAIRPERSON FROINES: It's just a statement of fact. I'm getting all these nods back there. We have the audience agreeing.

PANEL MEMBER LANDOLPH: Yeah, I'd be happy with that John. Then that would get across, you know, the feeling -- the idea that we would like to see it as low as possible, and they can do what they want to do with it. That's fine.

PANEL MEMBER BLANC: Can I ask the drafters a couple of questions. I would maybe guide John in any wordsmithing that I had. I wasn't sure what your implication was, that I absolutely understood it.

At the very beginning when you talk about the substance and refer to it as Vikane and then later in Point 11 refer to the approved use of ProFume --

PANEL MEMBER ATKINSON: That's for a different

use. That's for food commodity fumigation rather than structural fumigation.

PANEL MEMBER BLANC: Right. Therefore, does -- is the implication that everything you're talking about only refers to Vikane? I mean, putting the Vikane in parentheses at the very beginning and then much later talking about ProFume -- first of all, is Vikane the only trade name -- that's the only product on the market is always Vikane?

PANEL MEMBER ATKINSON: Well, ProFume is --

PANEL MEMBER BLANC: Aside from ProFume.

PANEL MEMBER ATKINSON: As far as I know.

DPR STAFF TOXICOLOGIST LIM: Yes.

PANEL MEMBER BLANC: So there's only a single --

DPR STAFF TOXICOLOGIST LIM: For the structural fumigation used in the nonfood commodity fumigation use. So for the food fumigation use, is a separate name but the same chemical.

PANEL MEMBER BLANC: Right. And that's currently licensed also.

DPR STAFF TOXICOLOGIST LIM: It was approved in 2005.

PANEL MEMBER ATKINSON: And the use of that isn't evaluated. I mean that's not in number 11.

PANEL MEMBER BLANC: Right. Okay. So one thing

for our wordsmither to take into account when you read that -- and this could have been my idiosyncrasy in reading it, is that I wasn't prepared suddenly to hear about this other product at Point 11.

PANEL MEMBER BYUS: Yes. But we were requested at the last meeting to make that clarification.

PANEL MEMBER BLANC: No. No. It would be nice to have it at the very -- maybe a sentence that there's 2 products. And, you know --

PANEL MEMBER BYUS: But that was part of our discussion, was to really -- even though the document wasn't dealing extensively with the use of that compound on food, because that it potentially might be, we were requested to and did. So we tried to clarify it.

PANEL MEMBER BLANC: No, and I absolutely agree with that. I think that's great.

CHAIRPERSON FROINES: So basically, Paul is asking for I think a sentence up front someplace that says there are --

PANEL MEMBER BLANC: Licensed products.

CHAIRPERSON FROINES: Registered users, is that the term to use?

DPR STAFF TOXICOLOGIST LIM: Two registered products.

CHAIRPERSON FROINES: Two registered products.

DPR STAFF TOXICOLOGIST LIM: Yes.

CHAIRPERSON FROINES: And Vikane, which is used for and ProFume which is used for and that's the sentence.

PANEL MEMBER BLANC: Right. And then --

CHAIRPERSON FROINES: Joe, you keep raising your hand, Paul is into his comments --

PANEL MEMBER LANDOLPH: Yeah. Let him go ahead and finish. That's fine.

CHAIRPERSON FROINES: But if you weren't finished with yours, then I --

PANEL MEMBER LANDOLPH: Oh, 10 seconds. On page 37 there is a sentence which deals with that comment that I made as modified by Roger and Paul and yourself. It just says, "As depicted in Figure 5, the predicted concentration rapidly decreases during first 2 days following clearance and tends toward 0 around day 6 or 7."

CHAIRPERSON FROINES: What page is that?

PANEL MEMBER LANDOLPH: Thirty-seven. It's the first of volume 2.

CHAIRPERSON FROINES: Okay, I can work with that.

PANEL MEMBER LANDOLPH: So that's basically the same sentence.

Sorry, Paul.

PANEL MEMBER BLANC: No, no.

And then I think the only other real substantive

question I had was when you refer to target organ toxicity on point 7, and you say it's the brain respiratory system and teeth.

PANEL MEMBER BYUS: Is that what we said? Yes.

PANEL MEMBER BLANC: I mean I think it would be --

PANEL MEMBER BYUS: Fluoride goes to the teeth.

PANEL MEMBER BLANC: Yeah, but animals aren't going to die from the teeth, right? I mean, it's the brain and the respiratory system are the target organs for substantive lethal toxicities. I mean, it just -- that really struck me when I read it, it's like -- and since that's a substantive question, that's why I didn't just leave it to John. I would just assume get rid of the word teeth there, because it seems to weaken the point you're making or obfuscate the --

PANEL MEMBER BYUS: I'm not sure. Does it cause damage to the teeth?

DPR STAFF TOXICOLOGIST LIM: In severe cases the fluoride causes severe dental fluorosis that it could weaken the teeth. So in the NAS Report Committee, they actually made a point that they don't consider it a cosmetic effect that the U.S. EPA had done previously.

PANEL MEMBER BLANC: No, I agree with that. It's just that when you're talking about target organ toxicity

of a parent compound which kills through pulmonary edema and, you know, brain injury, and then -- that's a very minor point. I don't want to belabor it.

PANEL MEMBER BYUS: But the tooth toxicity -- toxicity to -- as I remember the toxicity to bone and teeth and calcium, I mean it is considered a toxicity --

PANEL MEMBER BLANC: The fluorosis.

PANEL MEMBER BYUS: And it is bad. And it is considered a very -- a non -- you know, it's not a good thing and it's considered a toxicity. So that's why I think what was included in there, among the various organs. It isn't necessarily saying that that was going to be the lethal dose toxicity, which if it were, then we would probably have included it. But if you're just talking about various organs and sites --

PANEL MEMBER BLANC: Well, you talk about in terms of target organs.

PANEL MEMBER BYUS: Target organs, yeah. And it is, in a sense, one. We'll take it out if you feel it's inappropriate.

CHAIRPERSON FROINES: You say the primary target tissues are the -- is teeth a primary target issue?

DPR STAFF TOXICOLOGIST LIM: Well, so far we've seen it in all the species -- I mean, some of the species

that we tested, so it sticks out. The fluoride will go there. And so --

CHAIRPERSON FROINES: No, but I think that -- you see, the point that I would make and I don't know what Paul is thinking, but the point I'm making is these findings are relatively brief, and they are intended to be read by the public, to just demonstrate that a review committee has reviewed the process.

Therefore, I think that the findings should have a high degree of specificity, and they shouldn't be encyclopedic in nature. And so in a sense what we really want to do is call attention primarily to those tissues and organs where we view in terms of what was used to make the ultimate decision on it being a Toxic Air Contaminant.

In other words, we can list a 100 different endpoints that may have be seen. But in terms of the public's understanding of the process, for us to emphasize what are the endpoints that actually lead to the decision, that's the place of emphasis, I think.

PANEL MEMBER BLANC: Well, just to come back to the reason why the paragraph struck me, Craig, is, you know, as you read through it, it starts with the non-lethal and then with repeated exposures primary tissues are the brain respiratory tract and teeth.

And then it goes through in detail appropriately,

it talks about 2 weeks of exposure and it's tremors, lethargy, respiratory effects, incapacitation, tetany, convulsion. That's all you know respiratory and brain. Animals treated for 2 weeks showed all these other organ site damages. Thirteen weeks the brain was the primary target organ, okay, the vacuoles and then other things.

And it's only in the other effects reported at 13 weeks that you hear about fluorosis, as you're starting to get these specific things and that's why I said, well you've got the fluorosis covered and it's not trivial, but I would simply delete the word teeth because its --

PANEL MEMBER BYUS: It's deleted.

PANEL MEMBER BLANC: -- glaring. Okay good. Those were my only real substantive ones. I have some other wordsmithing notes that I can give to John.

CHAIRPERSON FROINES: Charlie.

PANEL MEMBER PLOPPER: No other comments.

CHAIRPERSON FROINES: So let me make a couple of minor comments. And this goes back to an issue -- here's a sentence that I actually think we should take out, if it's okay with you.

You say, "Much of the margin of safety of using this compound in relation to minimizing human exposures relies upon the good work practices of licensed pesticide contractors."

PANEL MEMBER ATKINSON: Where is this?

CHAIRPERSON FROINES: It's page 2 of the findings.

PANEL MEMBER BLANC: What number point?

CHAIRPERSON FROINES: Five.

"Much of the margin of safety of using this compound in relation to minimizing human exposures relies upon the good work practices of licensed pesticide contractors." I don't think that's within our purview. I don't think that we should be talking, because I don't think we have any evidence, scientific evidence, that talks about how good or how bad work practices of pesticide applicators is.

PANEL MEMBER BLANC: That's not your point.

PANEL MEMBER BYUS: That's not my point.

PANEL MEMBER BLANC: Wasn't your point that these estimates presume --

PANEL MEMBER BYUS: Correct.

PANEL MEMBER BLANC: -- the use of good practices --

PANEL MEMBER BYUS: That's correct.

PANEL MEMBER BLANC: -- and therefore would not be applicable to misuse scenarios.

PANEL MEMBER PLOPPER: Why not just say that.

PANEL MEMBER BLANC: Well, I think that would be

a better way of saying. All of the estimates are predicated on approved use practices. And in scenarios of misuse, they're not going to be -- I mean, these --

CHAIRPERSON FROINES: What would be --

PANEL MEMBER BLANC: It would be 4 days and all that stuff.

CHAIRPERSON FROINES: All the estimates are predicated --

PANEL MEMBER BLANC: -- on appropriate use practices.

PANEL MEMBER BYUS: Right.

PANEL MEMBER BLANC: Semicolon, "In scenarios of misuse, these estimates would not apply" -- "...may not apply.

PANEL MEMBER BYUS: I don't see the difference in either statement. But the point is -- I mean we discussed it --

PANEL MEMBER BLANC: He's saying you cup is half empty and you're saying your cup is half full.

PANEL MEMBER BYUS: Okay. We really wanted -- we discussed this also. I mean, that was a big issue. We really wanted to make sure that this is a finding, that all of -- much of what is in the document is based on good -- following the application of protocols very, very carefully. And then if you don't, then the margin of

safety and potential exposure to not only workers, but bystanders and whatever, varies considerably from this, and likely to more toxic degree rather than a less toxic degree.

So it's a very unusual compound in that regard. That's what -- and that is the point we really want to make.

CHAIRPERSON FROINES: What I wrote was that that sentence sounded to me a bit too rhetorical. And I think this is a slightly improved sentence. And I think that "...upon the good work practices of licensed pesticide contractors.", it's a little too general in a sense. So that's fine.

PANEL MEMBER BYUS: Okay, we'll change it.

PANEL MEMBER BLANC: How about, "There by the Grace of God."

(Laughter.)

PANEL MEMBER BYUS: Well, it's from everything, from the calculating the amount that goes into the house, how you put the tent on, how you take the tent off, how you vent it. I mean, it's all these practices. And all through the document all of the concentrations are based on all of these assumptions. And we're not saying that they're good or bad. I'm not saying that pesticide applicators do a good or bad job. I mean, that is not

what that says. It just says that everything is based upon this and that the Margin of error would go up considerably, depending on whether this practice is followed or not followed, so we'll change it though.

CHAIRPERSON FROINES: No, no. That's fine. On number 11, you have when you're in to ProFume then, you have the sentence, "Such use is predicted to result in increased total exposures and possible lower margins of exposures than those calculated in this current risk characterization document. This use was not evaluated in this report."

The first thing I would say is I would add the word "...this 'increased' use was not evaluated in this report." But in terms of what's in the document, does this have a basis in the document, Craig, for -- just to make that larger sentence statement?

PANEL MEMBER BYUS: Yes, we --

PANEL MEMBER ATKINSON: Yes.

PANEL MEMBER BYUS: The document was modified in relation to the last. That was one of the points of our last discussion to clarify that, both in the document and in the findings to make sure that there was this consistency, because we all agreed that even though it was not being used extensively now for this, it could be in the future, and that we were -- we thought it was

applicable or appropriate for us to do this, provided there was the consistency. So we went back and DPR did change the document to reflect that and then we put it in the findings as well.

But I mean we can change the language, but it is consistent and it is in there.

PANEL MEMBER BLANC: What does, "...lower margin of exposure mean..."? Does it mean that the lower end of the estimated --

PANEL MEMBER BYUS: I believe so, yes.

PANEL MEMBER BLANC: It means more exposure?

PANEL MEMBER BYUS: Yes.

PANEL MEMBER BLANC: Lower margin means more exposure.

PANEL MEMBER BYUS: More exposure.

PANEL MEMBER BLANC: Is there a way of wording that that would sound like more exposure --

PANEL MEMBER BYUS: That's always the difficulty.

PANEL MEMBER BLANC: -- and not like less exposure.

CHAIRPERSON FROINES: Why don't you just say greater exposures?

PANEL MEMBER ATKINSON: Possibly greater exposure.

PANEL MEMBER BYUS: It is always the -- it is the

difficulty here of dealing with DPR's language versus what we're all used to. And I really don't want to get into that discussion, but we will.

(Laughter.)

CHAIRPERSON FROINES: Not today.

PANEL MEMBER BYUS: Not today. But it is -- I mean, as you all know, it is the difficulty for us is trying to use that language. I'm not saying the language is good or bad, but it's just we are not as experienced with it. I personally am not as experienced with it. So it's always a struggle for me.

PANEL MEMBER BLANC: I think one advantage of these kind of findings is, you know, you can translate -- I mean, you don't have to stick to their jargon, I think, strictly speaking.

PANEL MEMBER BYUS: Strictly speaking.

DPR STAFF TOXICOLOGIST LIM: May I say something?

In out conclusion on page 102, we actually change the word to say that it would increase -- it would produce greater risk, instead of saying margin of exposure. So I think that's probably better.

CHAIRPERSON FROINES: I would prefer to say greater exposures as a matter of science.

DPR STAFF TOXICOLOGIST LIM: But right before that it says, "...result in increased total exposures..."

in your finding, Item 11. So the few words before then already says increased total exposures, so if you wanted to stop right there, that would be fine.

PANEL MEMBER BLANC: Yeah, that would be fine.

PANEL MEMBER BYUS: That would probably be the best thing.

PANEL MEMBER BLANC: Just get rid of the rest of those three words.

PANEL MEMBER BYUS: Get rid of the rest.

CHAIRPERSON FROINES: Then the final thing that I have is I want to -- I was -- I had a problem with going from 12 to 15, because I didn't feel as though a reader could understand what was being said. And that is I think that one has to talk about -- one has to show the NOEL and RfC, one has to show the estimate of exposure that was made to subsequently calculate the percent of the RfC and the MOE, and then when one needs to show the ratio as a result of that.

And nobody in their right mind could read 12 through 15 and understand, for example, what the data in 13 and what the -- and so I have a proposal. I actually think that we can leave in that 13, for example. Although I don't -- for example, we have -- there's a sentence that says, "During the first 24 hours after residents are allowed to reenter the houses, the mean sulfuryl fluoride

air concentrations in these houses ranged from .01 ppm to 1.78 ppm.

Then there are 2 sentences -- then there's a sentence that talks about the ADD, and then you go back to ppm. And so the question is, why do you we need the ADD? We don't use the ADD any place to determine the risk characterization. So we have information in 13 and 14 about ADDs which we don't ever use for any purpose. It's simply information. And the question is do we want information -- just that information to fill out this document?

And my argument was the ADDs are not what are used to make the ultimate determination. So therefore, what I would propose is, one, to add something that I can write from -- there are 2 paragraphs on page 79 in the document that talk about the MOE and talk about the RfC. And I will add that to show that they're using a higher benchmark, for example, in this particular document. In other words, I'm going to tell -- would say -- would tell the reader what the criteria that DPR used in doing their calculation.

And then I would add Table 2 from page 86 and Table 2 on page 86 gives a scenario application phase first 12 hours, 24 hours. It gives the air level. It gives the hours exposed. It gives the air level as a 24

hour time weighted average. It then gives the percent RfC and the MOE. And that's the conclusion -- that's the information that DPR used to make their decision of this as a Toxic Air Contaminant.

So I think this table actually combined with the other table that shows the RfCs that is already in there, actually shows the reader what the basis of the decision making was. And so if you'll allow me to put in those 2, basically a table and a paragraph.

PANEL MEMBER ATKINSON: You'll have to take off the Stack method then in that table, because we don't discuss that at all in the findings.

CHAIRPERSON FROINES: You're right. You're right. Let me see here. Yes, that's easy to take out.

PANEL MEMBER ATKINSON: And presumably the non-food one.

CHAIRPERSON FROINES: Yes. And then I would keep in -- I would put Table 2 as referenced by -- with a reference in Section 15, which is where I think it belongs. Do you agree with that, Craig and Roger?

PANEL MEMBER BYUS: Yes, that's fine.

PANEL MEMBER ATKINSON: That's good.

CHAIRPERSON FROINES: Just put this table linked with 15.

Lori, is what I'm saying, are you comfortable

with that?

DPR STAFF TOXICOLOGIST LIM: Yes. That's Table 31, right, I think?

PANEL MEMBER BYUS: Right.

CHAIRPERSON FROINES: Table 31.

PANEL MEMBER BYUS: But make sure we --

CHAIRPERSON FROINES: Wouldn't you agree that Table 31 is the piece de resistance in terms of the ultimate decision?

DPR STAFF TOXICOLOGIST LIM: Yes, because we're --

CHAIRPERSON FROINES: You see, this is what's missing is this information.

DPR STAFF TOXICOLOGIST LIM: Right, because the listing is based on the RfC.

CHAIRPERSON FROINES: And so it's easy to put in.

DPR STAFF TOXICOLOGIST LIM: Yes.

CHAIRPERSON FROINES: And it's consistent with what Craig and Roger added in their Section 15, but this way you can look at it rather than reading it. So it's actually -- really more for clarification than substance.

So that's my comment. So that means that we need a motion to --

PANEL MEMBER BLANC: I move that we approve the findings with the modifications consistent with the

transcript of the discussion at this point.

PANEL MEMBER ATKINSON: Second.

CHAIRPERSON FROINES: Discussion?

All in favor?

(Ayes.)

CHAIRPERSON FROINES: The vote is unanimous.

Craig and Roger --

PANEL MEMBER BYUS: I'm so happy.

(Laughter.)

PANEL MEMBER BYUS: I'm going to go get my house fumigated.

(Laughter.)

PANEL MEMBER LANDOLPH: Then you're going to Hawaii for a week, right?

CHAIRPERSON FROINES: You realize that this sulfuryl fluoride is really the tip of the iceberg when it comes to fluoride.

PANEL MEMBER BYUS: I know. But I must say we did include a very nice discussion of fluoride toxicity in this document, as well, which is very, very well done and comprehensive.

CHAIRPERSON FROINES: And did you 2 decide whether you agree now with fluoride in the drinking water?

(Laughter.)

PANEL MEMBER BYUS: We're in good agreement, are

we not, Lori?

DPR STAFF TOXICOLOGIST LIM: Oh, absolutely.

CHAIRPERSON FROINES: Okay. Thanks, Lori.

DPR STAFF TOXICOLOGIST LIM: Thank you.

CHAIRPERSON FROINES: Very good.

We had talked about having diesel come next, because of timing issues.

PANEL LIAISON BEHRMANN: This is Jim Behrmann. Kirk Oliver has not yet arrived. He would be doing the diesel briefing.

CHAIRPERSON FROINES: But, Jim, is it also true that Kirk has to leave almost immediately?

PANEL LIAISON BEHRMANN: He'll be here for a period of time, roughly 11 to noon.

CHAIRPERSON FROINES: He'll be here at 11 to noon. Okay, so that would give us 45 minutes -- 40 minutes on methidathion.

PANEL LIAISON BEHRMANN: I believe Mr. Oliver's briefing will take roughly 10 to 15 minutes. It's not a very long briefing.

CHAIRPERSON FROINES: I'm just trying to figure out whether we want to have Tobi talk about the pesticide. How long do you think that's going to take?

DPR ASSISTANT DIRECTOR JONES: Probably not more than 10 to 15 minutes depending on the questions you have.

PANEL MEMBER BLANC: John, I really suggest we start with methidathion, Supracide and just get our feet and see where we're at.

CHAIRPERSON FROINES: So, Tobi, let's go with the pesticide rather than your presentation.

PANEL MEMBER BLANC: So we're doing Supracide? We're doing methidathion?

PANEL MEMBER BYUS: First we're going to have to learn how to pronounce it.

DPR ASSISTANT DIRECTOR JONES: You've been practicing.

PANEL MEMBER BYUS: We don't seem to be able to do it, myself included on this.

(Thereupon an overhead presentation was Presented as follows.)

CHAIRPERSON FROINES: I just wanted to say one thing before you start. You know, I think everybody is breathing a sigh of relief because we finished sulfuryl fluoride. But if you look at our findings and you look at the number of times we discussed it and then the time it took for you folks to work on it outside of this and then the subsequent discussions, I think it's a very good example of a very intense and complete effort. And so I think it speaks well for the process. And I wanted to put that on the record so that everybody was aware that this

process has been extremely thorough and hopefully we can -- that will be the way to operate in the future.

Tobi, go ahead.

DPR ASSISTANT DIRECTOR JONES: I want to thank the panel for providing DPR the opportunity to present our methidathion risk assessment to you. I particularly want to thank Drs. Plopper and Atkinson for their review of the draft document and their advice on preparing this draft to bring before you today.

I asked Peter to hand out a single-page chart that is taken from our -- it should look like -- Peter, did you hand this out?

MR. MATHEWS: (Nods head.)

DPR ASSISTANT DIRECTOR JONES: Okay.

CHAIRPERSON FROINES: What is it?

DPR ASSISTANT DIRECTOR JONES: It's coming. The chart I'm handing out is taken from our 2004 Pesticide Use Report. And it is a chart on the trend of use of organophosphate and carbamate pesticides over the last decade. Methidathion is like a number of highly toxic OP pesticides whose use in California continues to decline.

This decline reflects the regulatory environment at the U.S. EPA; the availability and the use of newer safer pesticides; and the inevitably development of pest resistance to older pesticides, like methidathion.

As the DPR staff will discuss with you today, methidathion is used -- methidathion use is down by approximately 90 percent over the last decade. But its use patterns still reflect potential exposures that DPR believes warrant its listing as a Toxic Air Contaminant.

And on that note, I'd like to introduce the DPR staff who will be making the presentations today. Parakrama Gurusinghe, who goes by Gura, will be discussing the environmental fate and use of methidathion. Sheryl Beauvais will be discussing the assessment of exposure to methidathion. And Carolyn Lewis will be discussing the health risk assessment.

Thank you.

CHAIRPERSON FROINES: Thank you.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Good morning. My name is Gura. I'm with the Department of Pesticide Regulation, Environmental Monitoring Branch. And I'll be presenting to you the information I reviewed on the environmental fate of methidathion. And I'll discuss this in 3 main areas: the physical chemical properties of the compound; the use information; and finally the environmental fate.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: You can see -- this is the main active group

in this compound. And it has a ring structure. And there are some important aspects of this structure with respect to its activity, and also some of the information that I'll be discussing later on.

And most of the statistics given here are related to its properties, the molecular weight, and then it belongs to the chemical family organophosphorus and thiadizole group.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: The statistics give us some indicators of how it behaves, whether it's a liquid or a solid under normal temperature and pressure; and also its water solubility and its affinity to move in soil and water.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: The next slide. This gives some information about where it is used. And, as you know, the Department has categorized this as a restricted use pesticide, primarily because of its toxic properties. And it's used as a non-systemic, in other words contact, insecticides. For it to be effective, the target organisms have to be in contact with the applied chemical.

And right now there are 2 registered products. One, has the signal word "danger". The second one has the

signal word "warning". And both have approximately 25 percent technical methidathion in them.

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PANEL MEMBER BYUS: I have a quick question on that. What exactly do you mean by this non systemic? I mean, you tried to explain it. I didn't quite catch it.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: See there are 2 main groups of pesticides depending on their mode of activity. Systemic pesticides have to be absorbed by the plant and the plant has to be consumed by the target pest and then it becomes toxic.

Whereas, contact pesticides, the target organism doesn't have to consume it. It has to come in physical contact with the pesticide, so it becomes absorbed through the skin or some other mode, which becomes toxic.

PANEL MEMBER BYUS: So you have to spray it when the insect is on the plant, rather than spraying the plant and then waiting for them to eat it?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yeah. All the pesticides should be on the plant at the time the insect visits the plant for it to have physical contact.

PANEL MEMBER BYUS: Thank you.

PANEL MEMBER BLANC: And if there are 2 licensed -- there are 2 formulations, are both of the

formulations called Supracide?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yeah. There are different. One is wettable powder. The other one is emulsifiable concentration.

PANEL MEMBER BLANC: But they're both Supracide? They're both the trade name Supracide?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yeah.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: And currently it's recommended for a variety of different crops. And you can see the recommended rates change. And citrus has the highest active ingredient recommended per acre.

Next slide, please.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: This is the information that we have with respect to the use patterns of methidathion. I have use 1991, because that's the year in which we started the Pesticide Use Report Data System. And then I have taken information for the 10 years of '94 to 2003. As a matter of fact, my colleague will be discussing some of the information that was recently released for 2004. I did not include it in this slide. You may see that there's a

slight increase from 2003 to 2004 from about 52,000 pounds to about 61,000 pounds.

CHAIRPERSON FROINES: I had a question about that. Is that normal variation, at this point or is there something going on that would lead you to think that there will be a continual increase?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: In my view, probably not, because there's a general tendency, and also the encouragement by the Department not to use organophosphates in areas where there are alternatives. So this ma -- I don't believe that it's going to be a trend setter. Very likely it may be an occasional event that may went up for some local reasons.

CHAIRPERSON FROINES: So you would anticipate a continuing decline?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yes, I believe this lowering trend will continue. I don't know whether it will plateau off, because there are certain situations where there are no really good substitutes, so they may have to use some amount on some crops until such time we get a different alternative. But right now most of these uses have been replaced by many groups of compounds.

One important one is the oils. What do you call

them? Sorry -- the oils that are used, heavy chain oils which are effective on many different organisms.

PANEL MEMBER BLANC: Do you have some sense of what specifically happened in 1997 and 1998 when the rate dropped nearly in half? It's a far more drastic rate than the general drop in organophosphates that was shown in the figure that was passed out? Was there some very specific thing that caused it to go from 300,000 to 150,000 pounds annually that you're aware of?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: I'm not aware of it, but I can check it for you. And, if necessary, I can report if there is any reported information as to why that sudden drop, whether a lawsuit or something of that nature. I can check it in the literature. If it is reported, I can find it out.

PANEL MEMBER BLANC: It would be interesting from a policy point of view, because if it was -- if it's suddenly 150,000 pounds of some other product, we probably should be aware of it.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: I'll check on that.

CHAIRPERSON FROINES: Was there maybe an introduction of some alternative?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: That's a possibility.

CHAIRPERSON FROINES: Because it's very dramatic in '98.

--o0o--

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yeah. Then this is the distribution by county. As you can see, most of the use of methidathion has been in the San Joaquin valley counties, except for a few, Butte and Monterey county. Almost all of them are concentrated in the southern part of the valley. And as you can see, '91 Tulare county was using the most. And right as of 2003 it's Kern county that's the leading using county. And these are counties that have reported more than 10,000 pounds used in 1991.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Then with respect to the month, there are 2 peaks of use for methidathion. The winter use December, January, February, which is mostly on the winter crops around the winter plants, which are the dormant-plant stage on the dormant trees. And summer usage is mostly on the crop itself.

PANEL MEMBER BLANC: So you're saying that -- I mean, almonds are not dormant in February. That's when they're blooming, so --

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST

GURUSINGHE: Yeah, but they may be receiving December January.

PANEL MEMBER BLANC: I see.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: You can see that January has the largest. And almond is -- I'll show you later on. Among the crops, almond is one of the major crops, at least in the past. Right now -- yeah, next slide, please.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Okay. You can see almonds have been the largest user in the past followed by oranges. Right now, it's the oranges that receive the most as of 2003 followed by almonds and then a few other crops.

Next slide, please.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Then this summarizes the use amounts. As you can see, for the 2 years -- the comparing 2 years, 1991 and 2003, up to the 90th percentile. The amounts used have not changed much, but there is a drastic reduction in large amounts of use at the 95th percentile in 2003 relative to 1991.

CHAIRPERSON FROINES: One question. This data is so dramatic, why are small amounts still being used? I

mean, it seems to me that one could argue that if you have a relatively toxic organophosphate and most people have found alternatives, why do people continue to use this material?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Offhand, I cannot give you as these are the reasons, but I can suggest some. When you look at the trends, it is more efficient with respect to information transferred to larger farms than the smaller farms. And they participate in most of the training and discussions with the county and commissioners who are the ultimate people who communicate with them directly.

Therefore, it may be that the smaller farms may not have changed their practices that much in relation to the larger farms. That is one possible explanation.

PANEL MEMBER BLANC: So since you have the data -- if you'd go back the 3 slides to the acres and -- yeah. No, the next one. Yeah. This is pounds produced. I guess somewhere else you have acres of use in a different -- I guess in this other one. I'm sorry. This is totally organophosphates. But in any event, I think that for your ultimate document or you may want to consider a revision of not just the acres and the pounds but actual number of users, licensed users, because your data that you've just shown -- if you go forward again --

would indicate that the actual number of users hasn't changed almost at all, right? Because you've got the percentile of -- 75 percent of the people who use this, use 75 pounds or less and that hasn't changed at all in all these years.

So that the bulk -- it's a skewed plot. Most of your pounds and acres of use are the dropout of huge acreage applications of a lot of pounds all at once. And between 1991 and 2003, 80 percent of the people who used it are still using 5 pounds or 25 pounds or whatever. Maybe it's not true. But if you -- John, do you see where I'm going with this?

CHAIRPERSON FROINES: Um-hmm.

PANEL MEMBER BLANC: It wouldn't take very many large acre large pound users to fall out for you to get a dramatic drop in total pounds and total acreage without having much change in the total number of users. Now maybe that's not true, but you have the data available to you and it would be important to see.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Very likely the pesticide use database will have each individual case, so it should be able to look at the number of users with respect to the amount used.

PANEL MEMBER ATKINSON: But surely that's on a percentage basis not a user basis or not an amount basis.

So if the total usage has gone down by 80 percent, I would just view that as telling me that you've gone down 80 percent across the Board, since the 2 plots are essentially identical from the 2 years.

PANEL MEMBER PLOPPER: It's the same distribution of use.

PANEL MEMBER BLANC: Well, it's not, because it's not -- that part where there's a gap there is --

PANEL MEMBER ATKINSON: Well, it's not exactly a huge gap.

PANEL MEMBER BLANC: Well, anyway, I'd like to see it.

PANEL MEMBER ATKINSON: Okay, whatever.

PANEL MEMBER BLANC: Just double check. Maybe it's not true.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Then with respect to the breakdown of methidathion in the environment, you can see with increase in temperature from 20 degrees to 50 degrees, there's a drop.

CHAIRPERSON FROINES: I just want to make a contentious -- I'm sorry, because I don't mean to interrupt you. But from a policy standpoint, this is an extremely interesting question, because it really does -- one can ask the question, is it possible to essentially

eliminate the use of this particular compound over time? And is there an approach that might work well to accomplish that, if that were seen as something that was useful to do?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Are you expecting an answer from me?

CHAIRPERSON FROINES: No, it's --

(Laughter.)

CHAIRPERSON FROINES: It's a rhetorical question.

(Laughter.)

CHAIRPERSON FROINES: That's a very good response.

(Laughter.)

CHAIRPERSON FROINES: No, but this is clearly a compound that is -- you know, you could reasonably ask the question maybe they're using last year's supply. And so that as it goes down, there are reasons why people keep using things. And sometimes it's inertia. And so looking at these kinds of data, does say well maybe we should figure a way to get rid of it all together.

PANEL MEMBER BYUS: Well, it's a marvelously effective compound at killing insects on crops. That's why people use it. I mean, it's marvelously effective. It's unfortunately highly toxic, but it's marvelously effective. And they have a lot of experience using it.

They don't have to have -- you know, that's a big factor when you're trying to introduce a new compound. You have to prove that it's as effective and as easy to work with and it's difficult.

CHAIRPERSON FROINES: But there's also resistance developing.

PANEL MEMBER BYUS: Well, I mean, you know, it's just -- we're speculating here, but it's marvelously effective in killing insects and keeping the crops viable and productive.

CHAIRPERSON FROINES: Let's go ahead.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Okay. So you can see the breakdown becomes very rapid with the increase in temperature from 20 to 50. At the same time, when the pH increases with increasing alkalinity, the breakdown becomes rapid. And in combination of both, it becomes even faster.

And I put 15 degrees at pH 9 and pH 10. Some situations -- this may be one of the things that you may see in nature. So you can see there's a drastic difference if the pH is -- if the alkalinity is higher at 15 degrees the breakdown becomes more faster than alkalinity of 9 pH and temperature 15, which takes 25 days to breakdown, roughly.

PANEL MEMBER ATKINSON: So one would presume this

is best catalyzed hydrolysis?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yes.

PANEL MEMBER ATKINSON: So can you fit those data to an equation with either a neutral plus base catalyzed or base catalyzed only? Essentially, get rid of all the numbers and replace it by an expression which allows you to predict the lifetime as a function of temperature and pH.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Theoretically, yes.

PANEL MEMBER ATKINSON: I think it would be wise to do that, because that's one problem I have with a section in the report. There's bunches of numbers but there's no real conclusion to it. So if you could fit all those to an expression like a 1 parameter or 2 parameter expression that would fit them, then that would be excellent.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yeah, I'll look at that.

Thank you.

Next slide, please.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Then with respect to the persistence in soil,

you can see on the aerobic conditions, it's the microbial breakdown which is the most important factor of degradation of methidathion in soil. And in soil it undergoes chemical breakdown, photolytic breakdown as well as biological breakdown, which all 3 are involved in soil.

Next slide, please.

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PANEL MEMBER ATKINSON: Can you go back one. You state there that it's got a low mobility in soils. And yet in the document on page 17, you've got a comment that suggests considerable leaching potential. So how do you reconcile those?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yes. See the unusual thing in this compound is -- the unusual thing in this compound is in nature we come across many different situations than we have tested it for. It's very low solubility in water, but it's found in the river systems in California. It's found in the deep wells in California. So it finds its way for it to move under a certain set of conditions, which we have not tested for.

So what we have tested for all suggests that this product should not move in water; it should not breakdown; it should not be in there; but we have found it on all of those places, unfortunately. So there are a certain set

of conditions that we have not tested, which allows it to be present in places that we don't expect it to be.

PANEL MEMBER ATKINSON: There is a couple of places in the text where "leaching" has been replaced by "leching", so it's become a bit of a lecher apparently.

(Laughter.)

PANEL MEMBER ATKINSON: So I think you need to fix those.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Okay. Sorry, I didn't see that.

PANEL MEMBER ATKINSON: Otherwise, it should definitely be banned.

(Laughter.)

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Then with respect to fate, there is no direct information with respect to gas phase atmospheric chemistry or methidathion. And all the information so far with organophosphorus compounds, one would expect it to react with ozone, hydroxyl ions, as well nitrate ions in the atmosphere.

And Winer and Atkinson in 1990 showed that the hydroxyl radicals that are important in the breakdown of most of the organophosphorus compounds and the entire lifetime may range from .8 hours to 2 days. And this

particular modeling procedure AOPWIN model, which is a model developed in collaboration with U.S. EPA and Syracuse-based research organization, which is capable of predicting the half-life period of compounds given what it reacts with and what the compound that it's reacting on. So when they modeled for methidathion, they came up with the half-life of .071 days for methidathion.

PANEL MEMBER ATKINSON: Yeah, except that model is really not applicable to some of the portions of the structure in this compound.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yes, I'm coming to that.

PANEL MEMBER ATKINSON: I mean, that's a real problem. It's not really applicable.

--o0o--

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: So on the same subject, others in 1988 looked at the gas phase reaction of a series of Trimethyl Phosphorothioates, where this particular compound is the one that is of interest to us, because structurally it is very similar -- structurally it is very similar to this part of methidathion.

And in this study they reported, these are really experimental information, the breakdown may happen between 5 hours to 2.5 days at that concentration of hydroxyl

ions. And I may add one year later, Atkinson and others demonstrated that it is the sulfur that gets oxidized. It is this sulfur that gets oxidized and forms the oxon, which we call methidaoxon.

PANEL MEMBER ATKINSON: The number you'd given on page 20 seems to be off by a factor of 2. Anyway, I've got these comments, so I'll give them to you afterwards.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Okay, sir. I think I have your paper with me also.

PANEL MEMBER BLANC: Can you just clarify -- Paul Blanc here -- when you're talking about the half-life, you're talking about the half-life of going from the parent sulfur compound to the oxene compound?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yes, I believe that, because that's how they have said -- they have said half-life, but they have not defined in the paper this is the breakdown from that, but I assume that is what they --

PANEL MEMBER BLANC: So since what we really care about is the oxene compound?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Oxon is one of the products, but both are toxic.

PANEL MEMBER BLANC: Right. But the oxone

certainly isn't any less toxic?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: No, more toxic.

PANEL MEMBER BLANC: So is the whole discussion in the document about this half-life at all, this emphasis, a little bit misleading in that it gives you a sense that it's a detoxification half-life, it's really toxification half-life? And what we really care about is what the half-life then of the next thing is, if we knew?

PANEL MEMBER ATKINSON: Well, that may be true, but the half-life is still the half-life of the parent compound. It may form less or more toxic products. You have to do that on a case-by-case basis.

PANEL MEMBER BLANC: Well, I'm talking about this case.

PANEL MEMBER ATKINSON: Yeah, well this case, but apparently there's -- the document states there's no data on the toxicity of the oxon, at least that statement is made somewhere in here.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: In the literature review I did not come across specific information anywhere saying that this is the toxicity of methidaoxon.

PANEL MEMBER ATKINSON: It also depends upon the yield of the oxon from the parent compound, and that's not

known.

PANEL MEMBER BLANC: Well, okay, but my point here is if you have all of this emphasis on the half-life of this nasty substance in your document, the implication for the normal reader would be oh, okay, so we're dealing with something we have to think about in 2 days there's half as much of it. But actually there's half as much of it, but then there's most of what it's going to is something which has the same biological effect, probably.

PANEL MEMBER BYUS: Is that true, that would be my question? Is that statement that you just made true?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: It is possible, because methidaoxon is more toxic than methidathion.

PANEL MEMBER ATKINSON: Yeah, that would need to be pointed out. There's no doubt about it.

PANEL MEMBER BYUS: More toxic to humans and to insects? I mean, this is the sort of -- this is where this toxicity -- see, when I talk toxicity they're often times talking about slightly different than we view this. So I mean so that the use of it in terms of killing insects, is it parallel?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: The general statement has been made in literature methidaoxon, the oxidated product is more toxic

than methidathion. I'm not sure whether I can say for sure it's only for animals or for humans or for insects.

PANEL MEMBER BYUS: Okay.

CHAIRPERSON FROINES: Well, we know by analogy that pure oxon is more toxic than its parent.

PANEL MEMBER ATKINSON: To insects or mammals?

CHAIRPERSON FROINES: Mammals

PANEL MEMBER BYUS: To mammals.

PANEL MEMBER ATKINSON: To mammals. Okay, just asking.

PANEL MEMBER BLANC: I think it's a more potent cholinesterase inhibitor.

CHAIRPERSON FROINES: And so Paul is asking are we dealing with something that's more toxic to human beings in its oxygenated form relative to the sulfur parent compound?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: The way it looks is yes, it is possible that because the oxon is more toxic than the methidathion, it could be that by-product is more -- is a factor that we have to look at. But in the air, the breakdown is rapid.

CHAIRPERSON FROINES: Well, I think that what he's saying is that the half-life -- if the half-life is to a more toxic compound, then that's not a detoxification pathway, so the document needs to be consistent in the way

it addresses that issue. It needs to be clear, that's all I think he's saying. Is that right, Paul?

PANEL MEMBER BLANC: Yes.

PANEL MEMBER ATKINSON: The other problem does come up, at least from the atmospheric side, that the yield of the oxon, the amount that's formed when the parent compound is reacted away is not known. It's presumably quite a lot less than 100 percent.

PANEL MEMBER BLANC: I think the other question I would have is all this talk about the ox -- the half-life in air, that would apply to pesticide let's say that was aerosolized or sprayed or gets in the air, and how long does it last in the air? You've just told us a few slides ago that when you put it on the plants, it stays on the plants in a sort of, more or less, neutral -- if there's a more or less neutral condition that's less than 100 degrees Fahrenheit, it's going to last on the plants for 20 days.

So then let's say a wind came through and made some go off the plants, then it's only entering -- there's a reservoir for it to continue entering into the air after a spray event.

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: But the label gives, if I'm not mistaken, only 5-day reentry period.

PANEL MEMBER BLANC: And the basis for that is?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: That's the information that's offered to the Department with respect to the risks involved.

PANEL MEMBER BLANC: And --

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: That's how they decide the reentry into it.

PANEL MEMBER BLANC: Right. And the reentry interval is discussed in your document at some point?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Not in my document, but I believe my colleagues will be discussing the toxicity to farm workers in the work health and safety aspect of the compound. And Sheryl will be discussing the medical toxicity aspect of the compound. And in a slide I'll be showing in a little while, the methidathion how it migrates from the area it is applied and what the concentrations for the same period which may partly answer some of your questions.

CHAIRPERSON FROINES: Why don't we go ahead, because in some respects we're asking you questions that could more correctly come up a bit later.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Yeah, this is the study that I'm going to refer to. Unfortunately, I removed the information, but

I'll mention to you, this particular study was done by Aston & Seiber in '97, first reported in '97. Hey studied areas.

Lindcove at roughly 500 feet elevation is very close to the places where the pesticide -- this methidathion is applied in city or that area. And then they studied the midpoint, Ash Mountain, which is about 1,500 feet elevation, and Kaweah about 6,000 feet elevation. And Lindcove they detected all 3 -- all 2 compounds at varying levels, and in the concentrations roughly 10,000 parts per trillion. And they detected more methidathion than methidaoxon.

And when you went to the mean elevation, for the same period, they detected methidaoxon more and methidathion less often at the concentration of 200 parts per trillion. So 2,000 parts per trillion, one-tenth roughly. Then when they went to the highest elevation, they detected only methidaoxon for the same period, and at 200 parts per trillion, so that means there's another 10-fold decrease.

So for the same period, they become less frequent and also they breakdown quite rapidly in the air. So that should answers part of the concerns doctor raised.

PANEL MEMBER ATKINSON: What time of year was that study done?

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: This is from -- let me check -- from June -- yeah, they studied from May 25th to October 17th.

PANEL MEMBER ATKINSON: Okay.

--o0o--

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: Then the second study that I'm going to cite, and I forgot to mention, my colleague Sheryl will discuss this in detail, because they are relating the data from these studies in their estimates. I will just setup the basics of the study, so that they can pick up from there.

And this study was requested by the Department of Pesticide Regulation and it was commissioned by the Air Resources Board and conducted by Royce and others at Cal State, Fresno.

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DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: And these are the 5 areas they studied -- 4 experimental areas. Site at University of California at Lindcove, Exeter High School, and then Lindsay, the Jefferson school and Strathmore, the elementary school. And the Air Resources Board, which is away from all the other places, these are very close to the places where the pesticide is applied. And Visalia is aware and is

considered not a potential site. They expect to see this compound.

--o0o--

DPR ASSOCIATE ENVIRONMENTAL RESEARCH SCIENTIST GURUSINGHE: And in this study in brief, they collected 81 samples and there were detections for methidathion as well as methidaoxon. And there were more methidathion detected than methidaoxon detected. And my colleagues will discuss the detailed numbers and the implications of those observations.

Then the second study is the application monitoring study done in this particular area in the map. And they applied methidathion to a 15-acre orange grove and monitored the methidathion and methidaoxon over a period. So they had base-line information of 1 observation before application and several other applications. One application and subsequent several intervals, where they detected methidathion initially and after some period they detected methidaoxon.

So in other words, even in an application you can detect methidaoxon coming up after few -- in this case after 1 and a half days, I believe. And this is the basic information that I came across in the literature.

And I think that basically concludes my presentation. And if there are anymore questions, I'll be

happy to answer if I know the answers.

CHAIRPERSON FROINES: Thank you.

PANEL MEMBER BLANC: Do you want to give your transcriptionist a break?

CHAIRPERSON FROINES: Pardon me?

PANEL MEMBER BLANC: Do you want to give your transcriptionist a break?

Do you want to give your transcriptionist a break? It's been an hour and a half.

CHAIRPERSON FROINES: You've got your hand in front of your mouth.

PANEL MEMBER BLANC: Do you want to give your transcriptionist a break? It's been an hour and a half.

CHAIRPERSON FROINES: I still don't understand what you're saying.

PANEL MEMBER ATKINSON: Do you want to take a break?

CHAIRPERSON FROINES: Yes, we can take a break, because we should have a shift in -- yes, but we're going to have a shift in topic when we come back. So let's take a 5-minute break.

(Thereupon a recess was taken.)

CHAIRPERSON FROINES: Welcome.

ARB SENIOR STAFF COUNSEL OLIVER: Thank you, Chairman Froines and members of the Scientific Review

Panel. My name is Kirk Oliver. I'm a lawyer with the California Air Resources Board. And I'm here to discuss with you the resolution of a case. Actually, the first and only case that has been filed against the Panel that went all the way through the litigation process and had a trial conducted in it. And case I'm referring to is, of course, the Apodaca versus SRP, ARB and OEHHA case that was decided back in February of this year.

And there are a few times in life where we have the opportunity to celebrate a complete and utter victory, but this is one. So the panel should be very proud of the efforts it put in to its painstaking review of the diesel identification documents that began back in the early nineties, came to fruition in a meeting that was held in April of 1998 up in northern California, at which the Panel forwarded the, basically, landmark review of diesel health effects to the Air Resources Board for identification of diesel particulate as a Toxic Air Contaminant.

As you know, the Air Resources Board acted upon your recommendation and named diesel particulate to be a Toxic Air Contaminant and that finding was put in to law in a regulation in Title 17 of California Code of Regulations.

Now, although we had garnered the support of many

members of the industry during that process and you heard from all of their experts, in fact you convened a special meeting just to hear from them, and the foremost authorities in this field, unfortunately the group consisted of a number of private individuals and the industry filed a lawsuit shortly after the identification to challenge the regulation. And not only that, but to set aside the unit risk factor in the other findings that the panel made on diesel particulate.

The plaintiffs argued in this case that the findings that you made and the regulation that ensued from your findings were not supported by substantial evidence, that essentially you had relied on junk science, was their term. And the plaintiffs' cited a number of the basic inevitable uncertainties in the risk assessment process. And this case was actively litigated. It was first filed in San Diego County Superior Court. I believe it was on Christmas eve in the year 1998.

Now, in another case in that jurisdiction, a judge denied a discovery request. And the plaintiffs had come to us and said that they really wanted to take your depositions and get in to your thought processes that you had undertaken in doing the findings, which simply isn't supported by law. And we refused. And when this judge in San Diego Superior Court rendered his decision denying a

similar request, the plaintiffs dismissed this lawsuit.

Unfortunately, they refiled it again in Fresno Superior Court, which they were entitled to do. The dismissal was without prejudice. And the case laid dormant for a couple of years until they sent a letter to the judge asking that the case be reactivated. Again, they approached us and sought discovery, written discovery, of your notes and the thought processes that you went through in doing the identification. They wanted to take depositions of your members. And, again, those things just are not legally supported. They're not authorized by law in this kind of an action or in any other.

So we hotly contested that request and won the ensuing hearing before a judge, where we argued the clear legal authorities. And the judge went our way on that.

Now, the plaintiffs, however, continued the lawsuit this time and they brought it to trial. A briefing was conducted and concluded about 2 years ago. And having been an active participant in writing that brief, I can tell you the record that you developed in the identification was the ammunition that we needed and we used to write that brief. And the hard staff work and ample record that was developed supporting the identification was the thing that we came back to again

and again in that brief.

Now, the brief was submitted June 2004, and the trial was conducted a year later. About a year ago, this part of June, 2005 we had a 2-day trial in Fresno Superior Court where we took the record to the judge. Because in a case like this, the evidence in the trial is limited to the record that was developed before you and before OEHHA and before the ARB. And, again, we felt very confident that if we had a judge that reviewed that record in great detail and weighed the evidence that he or she would come out on our side.

And fortunately we obtained such a judge, that such a judge was assigned to us, very thoughtful considerate person, and he heard the arguments of both sides. He read the voluminous briefs that were filed by the plaintiffs, as well as ours. And then he took several months to review the 25,000-page record himself. And the results of his review are before you today. The decision that he issued came out in February. And as you can see it's an utter victory for the panel as well as OEHHA and ARB.

Now, there are a few portions of the decision that you might find of note. And I'd like to direct your attention to a few of them, because they talk about the SRP's work. And those particularly begin at page 13 of

the decision. And there the judge cites what he found to be a nonexclusive list of the substantial evidence that supported your unit risk factor in your own findings and what OEHHA and what ARB did. And you'll note that the two first articles that he cites in his list are both of the Garshick articles. Those were a fundamental basis upon which the plaintiffs made their arguments, citing the uncertainties that existed in both of those studies and the disputes that had been aired fully before you in the scientific community about how those data were to be evaluated.

And there the judge lists both the Garshick studies as the very first studies that he cites as the substantial evidence supporting what you did and what you found.

Now, the plaintiffs made a great deal of dispute about the unit risk factor. And they took it on in several different ways.

They cited the scientific uncertainties in deriving a point risk value, like was done. They argued that law didn't authorize it also. They also said that there were differences in the types of diesel exposures that occurred back when most of these studies were done, given the facts that the diesel fleet has become a lot cleaner due to air pollution controls that have been

placed on those engines, and the fact that the diesel fuel itself that's burned today is a lot cleaner than diesel that was burned before. To the plaintiffs, that rendered invalid all previously conducted studies. But the judge did not agree with them. And you can see the rationales that he used to reject those arguments throughout pages 16 through 25.

The plaintiffs also argued that the risks -- the unit risk factor was a regulation that somehow bound people out in society, and prohibited them from doing things or required them to do things, and that the unit risk factor was invalid because it wasn't adopted according to the Administrative Procedures Act requirements that pertain to regulation and government rule-making activities.

The judge reject that argument also, and said that the unit risk factor is simply what it is. It is a piece of scientific advice that the Scientific Review Panel gives to the ARB and perhaps the world large, if you think about it, about where the panel thinks the potency lies within the range of risk that OEHHA determines in its regulatory documents.

There is a part of the decision that I'd like to read to you, and it appears on page 17. And the judge talks about the uncertainty, and he says this, citing one

of the reports that appeared in the record that we gave him:

"Mark Twain was reported to have said that science is wonderful because it gives such rich returns in speculation for such a trifling investment in fact. To some extent, the same might be said for risk assessment."

And then the judge goes on to cite the reasons why risk assessment is absolutely necessary even given its uncertainties.

So, he concludes on that page at the bottom: "The unit risk factor is a reasonable estimate that fell within the range of risk which OEHHA was required to establish, if it did not itself set a unit risk factor on its own. The Legislature authorized CARB, OEHHA, and SRP to act even though they did not have precise or exact information."

I think the important message that the Panel should take from this decision is that the Panel should continue to do its business the way it's been doing it for all these many years. Since 1986 this panel has been an open, honest forum for the discussion of scientific fact, including uncertainty. And this judge, once he was confronted with one of the records that you developed, came down overwhelmingly on your side and on the side of honest scientific debate.

We're here to support the Panel and we're here to provide the legal defense that's necessary if one of these types of things happens again. And we stand ready to do that.

Keep in mind, this case is not an appellate case, it's not published in the appellate decisions, it's not something that could be cited by us or by another party in another lawsuit. Interestingly, when the decision came out and we were in contact with the plaintiffs about the house-making chores that have to be done to -- in the heels of a decision like this, that they approached us and offered to forego their opportunity to appeal this decision. Now, one can only speculate about their motivations for doing that. But that was an offer that we accepted, and that puts an end to this lawsuit forever. It will not be appealed. There will not be a chance for this judge's determinations to be overturned in any way. It's done, and its results and its dictates bind all the parties that were party to it.

So, I just wanted to congratulate you, bring this bit of happy news to your attention. And if the Panel members have any questions about the decision or its effect, I would be more than happy to answer them right now.

CHAIRPERSON FROINES: Questions?

PANEL MEMBER BLANC: So does this mean that the judge's statement, and I quote, "Dr. Froines' facetiousness does not justify overturning the SRP's setting of the URF," is not precedent setting then?

(Laughter.)

ARB SENIOR STAFF COUNSEL OLIVER: Let's just say that it would be a wise comment that any judge in the future would be well advised to take into account in evaluating Mr. Froines' -- Dr. Froines' remarks.

(Laughter.)

CHAIRPERSON FROINES: You just had to do it, didn't you?

(Laughter.)

PANEL MEMBER BLANC: It is interesting, by the way, that in that litany of publications that the judge invoked he did include the meta-analysis by Bhatia. And one of the things that we discussed -- you know, have discussed on and off in various context is what is the meaning and weight of meta-analyses. So I think that's --

CHAIRPERSON FROINES: He didn't include Alan Smith's meta-analysis.

PANEL MEMBER BLANC: He included Alan Smith's testimony, and it was --

CHAIRPERSON FROINES: Yeah, but not his meta-analysis.

PANEL MEMBER BLANC: That was Bhatia, was the first author on --

CHAIRPERSON FROINES: Oh, yes, you're right. Bhatia in '97, that's it. But they didn't include Michael Lipsett's.

PANEL MEMBER BLANC: Was that published or testimony?

CHAIRPERSON FROINES: That was published.

ARB SENIOR STAFF COUNSEL OLIVER: Oh, keep in mind that the judge said that this is a nonexclusive listing. So he didn't mean to --

PANEL MEMBER BLANC: That if it didn't appear, it wasn't --

ARB SENIOR STAFF COUNSEL OLIVER: Right.

CHAIRPERSON FROINES: So is it -- your point that you made I think is worth repeating. And, that is, that traditionally OEHHA has come up with a range of risk, and in diesel we actually made the overt decision to set a unit risk value -- to establish a unit risk value. And so in principle that decision to do that and our right to do it has been upheld?

ARB SENIOR STAFF COUNSEL OLIVER: That's correct.

CHAIRPERSON FROINES: So that's extremely important, because they could have ruled that we did not have that authority.

ARB SENIOR STAFF COUNSEL OLIVER: Yes, you're correct. And in the statutes that create the scientific review panel, the words "unit risk factor" never appear. However, the words "authorizing you to give advice to ARB on the toxicity of substances" do appear. And the judge did an excellent job of laying out the other legal authorities that would -- he found persuasive to authorize the Panel to make such a finding.

PANEL MEMBER BLANC: Can I ask you a hypothetical, just in terms of the logic of the decision. If this was a decision referring to input that we'd given on a pesticide, would the statutory support be viewed in your opinion as being any weaker for our actions?

ARB SENIOR STAFF COUNSEL OLIVER: I'm no expert on the pesticide side of it. But as far as I know, your role is the same in both processes. So I don't think that would have made a difference to this judge. But, again, that's a hypothetical and speculation on my part.

CHAIRPERSON FROINES: Joe.

PANEL MEMBER LANDOLPH: Do you expect situations like this to arise frequently in the future? That's the first question.

ARB SENIOR STAFF COUNSEL OLIVER: In the, oh, almost 20 years of the Panel's existence, this is the only such instance that occurred. And given the favorable

result for the Panel, I think that this would give other parties pause in bringing such a challenge. And we're not aware of any being mounted at this point. So I don't think it will make it more likely. I think it would make it less likely. And although this is not an appellate decision, it is a public document and has obtained wide circulation.

PANEL MEMBER BYUS: I think it provides some support for the quality of the legal system and the ability of judges to understand this kind of scientific information and deliberations. I mean this is a major concern in the legal system at all how judges evaluate all scientific information. They're not particularly trained to do it.

And it's more and more prevalent in almost all cases that science now becomes more and more important in how the judge evaluates it and understands it as how it's litigated. And for a judge to understand this and to rule, in my opinion, completely correctly, I mean that says a lot for the legal system, and hopefully all of the legal system, you know, it's just not judge specific. But it really is very comforting, at least for me, to know that a judge that's sitting on bench, not necessarily trained, but really must have put in some considerable effort to actually understand this. It was not an easy

task, is what I'm trying to say.

CHAIRPERSON FROINES: Well, let me just make a comment about that, because -- I don't know what Kirk thinks. But what you just said is absolutely a double-edged sword, you realize. Because under the Daubert decision U.S. Supreme Court decision, judges are getting very actively involved in the science. And that -- and the record of that involvement in the science has not been a very optimistic one. And so that -- there's an entire volume of the American Journal of Public Health devoted to -- the entire -- not a volume, but entire issue devoted to the Daubert decision and its implications. And they're worrisome in that respect.

And so its interesting that this judge actually got into the science. He could have taken a more conservative approach, which would have been just to look at the adequacy of the record. But in this case he chose to get in to review the science. And, fortunately, that was to our benefit.

ARB SENIOR STAFF COUNSEL OLIVER: What the judge did was examine the record to see whether it contained this legal standard of scientific evidence that pertains to regulatory activity in the scientific area. Whether the record had substantial evidence that supported what the findings were -- and substantial evidence doesn't

mean, you know, overwhelming evidence beyond a reasonable doubt, especially in this area where the Legislature has authorized us to act without scientific certainty.

So he did -- he did the level of legal analysis of scientific information that the law requires him to do. He did no more and no less. And that is what rendered a proper and just result here, because he basically followed the law.

CHAIRPERSON FROINES: Thank you, Kirk.

ARB SENIOR STAFF COUNSEL OLIVER: Thank you very much.

PANEL MEMBER BYUS: Congratulations. I mean I'm sure you had a little bit to do with this --

ARB SENIOR STAFF COUNSEL OLIVER: Yeah, I have a --

PANEL MEMBER BYUS: -- in writing this in the proper and correct way and with a sufficient clarity.

ARB SENIOR STAFF COUNSEL OLIVER: Well, thank you very much. And thank you for the --

CHAIRPERSON FROINES: Joe had one more.

ARB SENIOR STAFF COUNSEL OLIVER: Oh, I'm sorry.

PANEL MEMBER LANDOLPH: Oh, just one quick one.

Thank you for coming.

In terms of keeping records and keeping files, are we supposed to keep voluminous files on all these

things? I mean I can't store them, is the bottom line.

What is your view to that matter?

ARB SENIOR STAFF COUNSEL OLIVER: You're required to keep your records in the way that you keep records in the normal course of your business affairs.

And if this is something that the Panel would like to explore in another session, then that's something we'd be more than happy to come in and talk to you about.

But we're only as good as the record that was generated during your deliberations and the findings in the other agencies. And we want to thank you very much for the record that you prepared here. It was easily defendable.

CHAIRPERSON FROINES: I gather from what you said though that the rules of discovery in terms of deposition and record keeping are such that you would not anticipate that we would be called upon to provide that information in a deposition?

ARB SENIOR STAFF COUNSEL OLIVER: That's correct.

CHAIRPERSON FROINES: Great. Thank you very much.

ARB SENIOR STAFF COUNSEL OLIVER: Thank you, Chairman Froines. Thank you, members of the Panel.

CHAIRPERSON FROINES: It does require that there is no facetiousness in this group.

Okay. Onward.

Tobi's left us. Randy is...

(Thereupon an overhead presentation was Presented as follows.)

DPR STAFF TOXICOLOGIST BEAUVAIS: Good morning, everyone. My name is Sheryl Beauvais. I am with the Department of Pesticide Regulation. And I'm going to talk about the data that went into the exposure assessment for the ambient air and bystander exposures today and exposure estimates that came out of the data.

First of all I'm going to briefly talk about use just as it relates to the exposure assessment.

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DPR STAFF TOXICOLOGIST BEAUVAIS: This first slide shows the most recent five years of use for three of the top crops on which methidathion is used, almonds, artichokes and citrus. On the Y axis there it's under "Pounds applied per year".

And as you can see, the purpose of this slide is just to show you that the amounts on each crop vary from year to year, and that what comes out is the top crop varies from year to year. The slides that Gura showed you over a longer period of time made that same point.

Because the weather varies, because pest pressures vary and so forth, because there's some annual

variation, we don't use a single year's worth of use data when we're attempting to estimate the duration of exposure to people.

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DPR STAFF TOXICOLOGIST BEAUVAIS: And so when we're coming up with our exposure estimates, we instead come up with a five-year average. And that's what this slide is showing in this -- well, this is a five-year average based on pounds applied. And what's on the Y axis is actually percent annual use. And this is the 2004 to -- or 2000 to 2004 in Tulare County, all applications by all methods.

And what you can see here is -- well, this first of all makes the same point that Gura made with his slide for annual use across the state; and, that is, that we have dormant spray applications occurring in the winter months and also we have summer use. And when you look at what crops are -- this is mostly on citrus and walnuts is the summer use. This is peaches. And there is some use on almonds, which may be limited to January. I don't know.

But at any rate, this is essentially what the major types of use are. And then we've got less use happening in other months in Tulare County.

Now, we start with an assumption that people

could potentially be exposed throughout the year, but that they are more likely to be exposed during high use months. So the exposure's more likely during these times than during the months of March and April and September when use is down quite a bit.

We set an arbitrary cutoff of 5 percent. And we essentially say months that achieve or exceed that, then we're going to say these are the months people are most likely to be exposed.

So for the seasonal and annual exposures of methidathion that I'll be talking about later on, this is the data that went into that estimate of nine months. So essentially there are nine months that touch or go above this line.

CHAIRPERSON FROINES: Can I ask a question?

DPR STAFF TOXICOLOGIST BEAUVAIS: Sure.

CHAIRPERSON FROINES: That I've always been curious about.

During, say, January and February in that location, are there other pesticides that would be being applied to that same crop during that period of time? In other words are there multiple exposures or is it pretty much a one pesticide pattern?

DPR STAFF TOXICOLOGIST BEAUVAIS: So are you asking whether these are being applied in mixtures, or

whether --

CHAIRPERSON FROINES: No, what I'm really saying is -- are there -- is the actual pesticide load, the actual number of pesticides being applied during that particular period on that particular crop more than this one chemical?

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. And I haven't looked at that question. I would say the answer is going to be yes simply because I know that DPR has been encouraging dormant sprays to switch over to pyrethroids. And they've had a -- I cited it in the exposure assessment a document where they reported on this.

CHAIRPERSON FROINES: Randy?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes, this is Randy Segawa with the Department of Pesticide Regulation.

The answer is yes. There are a number of other pesticides used during that period on those same crops, such as chlorpyrophos, diazinon, several different pyrethroids, as well as some newer chemicals as well.

Okay. Thank you.

PANEL MEMBER ATKINSON: But you'd only use one pesticide on a given orchard.

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: In general, correct.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: Now I'm going to switch and talk about the air monitoring data. I'm going to talk about two studies that provided the data that were used in the exposure assessment. These were studies that were mentioned by Gura as -- they were studies that were requested by DPR and commissioned by ARB. And in both cases the studies monitored methidathion, the parent compound, and methidathion oxon, which I'm abbreviating for just clarity to methidaoxon, just to shorten how much I'm putting on each slide. And the different between the two compounds is the sulfur has been converted to an oxygen here.

We have both ambient air monitoring, which is sampling occurring at multiple sites during high use period, and application site monitoring, which is sampling adjacent to an application. And I'm going to talk about each of these studies now, starting -- well, after I tell you a little bit about the samplers.

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DPR STAFF TOXICOLOGIST BEAUVAIS: In both cases the samplers consisted of an arrangement of two sampling tubes, each with its own flowmeter, attached to a pump and a sampling tube. It would look something like this, with a sorbent layer and a backup sorbent layer, which will

tell you whether you've trapped all of the target analyte in the main section there. Those are analyzed separately. And there was no -- in any of these studies we had nothing in the backup sorbent layer.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: For quality assurance, consisted of replicate samples. And 20 percent of those were analyzed. Plus any time there was a detection, the replicate of that detection was also analyzed. There were control spikes analyzed with each set. The limit of detection was set at three times the standard deviation from replicate injections of the lowest standard. For methidathion that was .1 of a microgram per sample, and for methidaoxon it was .25 micrograms per sample.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: And continuing with quality assurance: Low levels of -- low level amounts of methidaoxon were found in blanks, both in the method development, the retention efficiency, and the field blanks. This was considered to be a artifact of the sample analysis. And so the way that I dealt with this was to subtract the average, which was this, and -- was the .13 micrograms per sample, which is less than the limit of detection, but it was reported. And this is the

range of the amounts that were found. So I subtracted that from the methidaoxon values.

PANEL MEMBER BYUS: I'm confused by this.

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay.

PANEL MEMBER BYUS: In other words you're saying that the compound is there ambiently from where -- I mean it's not part of a biological product. I mean it's a chemical that must have been sprayed some time, right? I mean I don't understand why you would subtract it out necessarily. But what is the object of that? Let me put it that way.

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: No, we do think that the methidaoxon concentrations were overestimated, because they were finding that compound even in the laboratory blanks, something that had never been exposed in the environment. And so we do think it's a laboratory artifact, and that's why we're subtracting it out.

PANEL MEMBER BYUS: So I don't understand what that means still. I mean I -- what --

DPR STAFF TOXICOLOGIST BEAUVAIS: In interference that caused it.

PANEL MEMBER BYUS: What is it -- can you explain to me what that means?

PANEL MEMBER ATKINSON: Maybe it was in a lob --

PANEL MEMBER BYUS: What do you mean? In other words is it -- how do you chemically identify it? Do you mass spect -- do you see mass spec? So it is in fact recombinant, right?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Well, in this case they did not use a mass spectrometer. They used an electronic capture detector, which is not as specific as mass spec. And so that's one of the reasons why we think it's an artifact.

PANEL MEMBER ATKINSON: So it's a peak?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

PANEL MEMBER BYUS: Is everybody all right with that?

CHAIRPERSON FROINES: You think it's an artifact and in fact is not that compound?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Correct. Because like we said, they were detecting that compound, even blanks that were never sent to the field.

CHAIRPERSON FROINES: Well, his point is then well taken. Because if it's an artifact, then you probably shouldn't be subtracting.

PANEL MEMBER ATKINSON: Well, if it isn't a compound, you should be, since it's a peak.

PANEL MEMBER PLOPPER: But they don't know what it is.

PANEL MEMBER ATKINSON: No, they don't know what it is, that's true. But it is less than the limit of detection.

CHAIRPERSON FROINES: So --

PANEL MEMBER BLANC: Well, I'm going to ask a different -- I would ask this related question. Your process of determining your limit of detection, wouldn't that automatically have taken into account this false baseline that you never got below?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Usually, yes. However, this monitoring study was done back in 1991. And the method that they used to determine the limit of detection would hold up under today's procedures.

CHAIRPERSON FROINES: I'm sorry, I missed that.

So could you state your answer again.

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: We also think that the limit of detection determined in the study has some uncertainty associated with it because they did not follow the procedure that is in use today.

PANEL MEMBER BLANC: Well, whatever procedure they followed, wouldn't it have involved spiking samples

and seeing what they could detect?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

And if they were getting these false signals that ranged from .1 to .161 --

CHAIRPERSON FROINES: No, it's 161.

DPR STAFF TOXICOLOGIST BEAUVAIS: Oh, I'm sorry. That's a typo.

PANEL MEMBER BLANC: .161 --

DPR STAFF TOXICOLOGIST BEAUVAIS: It is .161. I apologize.

PANEL MEMBER BLANC: Yeah. -- then wouldn't that -- however they did the calculation of the limit of detection, surely this sort of baseline signal that could never be gotten rid of must have been also in their measurement? Or was the limit of detection done with a different measurement technique than you actually used when you did the study? And I doubt that. Right? It must have been this electron capture for everything, right?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Correct.

Why they got what appears to be these compounds that are coming out at the same time as methidaoxon. But it's not actually methidaoxon. It's unknown at this --

PANEL MEMBER BLANC: No, no, that's not my question. And it comes back to the question of not subtracting this number twice, which is what John asked or Roger asked or somebody asked. I mean if that's already in your limit of detection, then you wouldn't then subtract it again after you do your limit of -- after you get a value -- let's say you get a value of .3. And then why would you subtract .1 from there? Because doesn't your value of .3 automatically take into account that you've got this?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: It's not clear from the report. We're not sure.

PANEL MEMBER BLANC: All right.

PANEL MEMBER BYUS: I've got one more question that I have.

If you're like, say, averaging .13 micrograms of sample of this artifact, what was your average total number from your field data?

DPR STAFF TOXICOLOGIST BEAUVAIS: Well, actually I'm about to show you that.

PANEL MEMBER BYUS: Okay. There we go.

(Laughter.)

PANEL MEMBER BYUS: Per sample. I'm interested in a per sample. Because if you're -- that's why I'm asking. I don't want you to divide by air volume or

whatever, because it's on a per sample. So if your signal -- essentially a signal to noise here. So if this is your blank, it's .13 micrograms per sample, your signal was --

DPR STAFF TOXICOLOGIST BEAUVAIS: I see what you're saying.

PANEL MEMBER BYUS: -- .14, then subtracting this number is going to be inherently totally inaccurate in terms of your measurement. But if your sample number was 10 micrograms and you subtract .13, then we're all right with that. That's why I'm asking.

Does that make sense?

CHAIRPERSON FROINES: Is the GCMS technique so different in sensitivity that you couldn't have looked with that approach in contrast to the electron capture?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: I'm sorry. Could you repeat the question?

CHAIRPERSON FROINES: Well, if you have a significant artifact using electron capture, that might suggest that you should use a GCMS approach. And why not do that? Because that would separate out your -- or presumably would separate out your artifact.

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: You're correct.

CHAIRPERSON FROINES: -- could separate out your

artifact.

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes, you're correct. And why that was not done, I'm not sure. It was not explained in the report. I presume that they did not have access to that instrument.

CHAIRPERSON FROINES: I mean -- okay. That's frustrate.

Go ahead.

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. And I'm not going to be able to answer your question after all, because what I have were those --

PANEL MEMBER BYUS: Just some time answer. You see why I'm asking it though?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

PANEL MEMBER BYUS: I'm not trying to be --

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah. Okay.

CHAIRPERSON FROINES: Yes, you are.

PANEL MEMBER BYUS: Yes, I am.

(Laughter.)

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. You're right. I can certainly add that information.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. Now, to talk about the ambient monitoring itself.

The monitoring was done in Tulare County in June

and July of '91. Locations and dates were chosen based on use patterns that had been analyzed by DPR previously. These were dates that were anticipated to have high use.

Sampling was done four days a week for four weeks. And there were a total of 17 samples when they were done, because they started up here on June 27th. Each sample was collected over roughly 24 hours -- between 23 and 25 hours.

CHAIRPERSON FROINES: What was the flow rate on your sampler?

DPR STAFF TOXICOLOGIST BEAUVAIS: If you back up. I've got it on there actually.

Yeah, right there at the bottom. For the ambient it was 4 liters per minute.

CHAIRPERSON FROINES: Four liters per minute. Okay.

DPR STAFF TOXICOLOGIST BEAUVAIS: And for the application site it was .185 liters per minute.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: And you've seen this slide already. This identifies the locations. Each of these sites where the samples were collected were within a quarter mile of citrus groves. So they were -- that were anticipated to be treated. So there was a high likelihood that methidathion would be used during that

time.

And then they had a background site that was an urban site away from citrus groves.

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DPR STAFF TOXICOLOGIST BEAUVAIS: And these are the results from each of these sites. The highest concentrations of methidathion came from the Jefferson School site in Lindsay.

And the average ± standard deviation was .069 .144 micrograms per meter cubed. And methidaoxon -- and this is -- I've subtracted the blank already from this. And so if we end up determining that's not the way to go, then these values will change. Methidathion will not.

These are the values that were used in exposure assessment.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: And the application site monitoring was done in July of 1991. And it occurred immediately before, during and following an air blast application to an orange grove. Sampling was done for a total of two days.

And I've got another typo on this slide, because it was actually applied -- it was a 15-acre orchard, not a five acre.

They applied a total of 45 pounds active

ingredient -- of methidathion, that is -- at the rate of 3 pounds AI per acre, to a total of 15 acres.

There were three sampling stations. And I'll show you where those are in a minute. First I just wanted to show you an example of what an air blast application looks like for anyone who's not familiar with it.

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CHAIRPERSON FROINES: Could you go back to the previous slide for a second?

So we're at micrograms per cubic meter. And you're ranging -- what's your detection limit again?

DPR STAFF TOXICOLOGIST BEAUVAIS: For methidathion it works -- for a 24-hour sample it works out to .01 micrograms per meter cubed.

CHAIRPERSON FROINES: So these numbers are a little bit more than that, but they're not dramatically different.

PANEL MEMBER BLANC: They're sampling four liters a minute?

PANEL MEMBER ATKINSON: Yeah, it's about 5 cubic meters per day, is what I just calculated.

PANEL MEMBER PLOPPER: This is a summation of a whole --

PANEL MEMBER BLANC: So it would be --

PANEL MEMBER ATKINSON: So effectively --

PANEL MEMBER BLANC: -- .069 times 5 is their total amount, right?

PANEL MEMBER ATKINSON: Yeah, that's right. So its .07 is -- it's .35 micrograms is roughly -- so it's not much above the limit of detection.

PANEL MEMBER BLANC: Or their noise level.

PANEL MEMBER ATKINSON: Hmm?

PANEL MEMBER BLANC: Or their noise level, because they --

PANEL MEMBER ATKINSON: Well, no -- yeah, it's not a lot above it.

PANEL MEMBER BLANC: Well, actually with this plus, another 1.3 because they subtracted -- .13 or --

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah, from the oxon only. The methidathion, no correction was made.

PANEL MEMBER ATKINSON: Oh, that's right. Just the opposite.

PANEL MEMBER PLOPPER: Can you go back one?

So that average is for all the days that were sampled, or --

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

PANEL MEMBER PLOPPER: -- is that just one day?

DPR STAFF TOXICOLOGIST BEAUVAIS: That's across all 17 samples.

CHAIRPERSON FROINES: And --

PANEL MEMBER PLOPPER: So that's 16 days' worth of samples.

CHAIRPERSON FROINES: Do you have any -- obviously you probably don't have any idea why you have that enormous --

PANEL MEMBER ATKINSON: -- standard deviations?

CHAIRPERSON FROINES: -- standard deviation.

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah. There were two days that were quite elevated. And there is a "Results' table in the exposure assessment that lists the individual results. And there was one day, July 10th, at Site J was .56 micrograms per meter cubed. And on July 11th, the next day, was .30 micrograms per meter cubed.

PANEL MEMBER PLOPPER: Were these samples taken -- was there a record kept of what the application pattern was at that time? I mean because that's --

DPR STAFF TOXICOLOGIST BEAUVAIS: There was no information given with the report about that. ARB's policy was to confirm applications afterwards, right?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: While we do have records of individual applications, the location's only good down to one mile. And so we can approximate the locations, but we don't know the exact location.

PANEL MEMBER PLOPPER: So that --

PANEL MEMBER ATKINSON: So there must have been -- oh, I'm sorry -- there must have been a number of those which were below the limits of detection then.

DPR STAFF TOXICOLOGIST BEAUVAIS: At Site J, not so many on the methidathion. Site J there were only 2 of the 17 samples that were below the limit of detection for methidathion. And 10 -- 11 of the 17 from methidathionoxon. So the oxon is based mostly on that detection limit.

CHAIRPERSON FROINES: So I'm still not clear.

Do you have records of was there application that occurred on the days where you had the high values? In other words, is there a way to see if there's a logic to the results?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: It's something we can check on.

PANEL MEMBER PLOPPER: How many times a year did they put this material on one orchard? Once, right? Maybe twice a year?

DPR STAFF TOXICOLOGIST BEAUVAIS: Maybe twice. Twice is the maximum allowed. So in most cases it would be once, just looking through POR data.

CHAIRPERSON FROINES: This is one of the generic frustrations about ambient monitoring that we've talked

about many times in the past, so that it's -- and this is a good example of some of the tensions.

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah, unfortunately these are the only data that we have that cover sites that are near applications.

Now, the UC site, who are mentioned, the study that was done in 1994, the Aston and Seiber study -- and they also monitored at the Lindcove station. And the concentrations they got there were within the same range for methidathion and much lower for methidathionoxon.

CHAIRPERSON FROINES: Why don't you go ahead. We're holding you up on this one slide.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. Going on to the application site monitoring.

The application was occurring in this 15-acre orchard here. And generally in this area prevailing winds were out of the northwest and the sample stations were set up this way, with that assumption in mind, where there was one station on the north side and two at the southeast, at progressive distances away from the field.

Unfortunately, as you're about to see, the wind directions didn't cooperate during the study. And all I can say is that these are the best data we have available.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: What I've done here is shown -- first of all, the background -- we had a background sampling. Wind was out of the northwest during that time. However, during the application itself, and for a total of six hours after the application was completed, the prevailing wind directions were out of the west and southwest and were not directly -- there was no sampling station directly in the path of the prevailing -- this dominant wind direction.

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CHAIRPERSON FROINES: Who was -- was this ARB doing that?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah. And I guess I would also point out that the sample stations are not set up that way today.

CHAIRPERSON FROINES: I don't mean to sound critical, but we --

DPR STAFF TOXICOLOGIST BEAUVAIS: Well, ARB contracted --

CHAIRPERSON FROINES: -- when we have problems in the air -- with our air pollution work, we stop sampling so we don't get results that don't mean anything.

And I think that -- I wouldn't -- I would assume you wouldn't do that anymore.

DPR STAFF TOXICOLOGIST BEAUVAIS: Right.

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: You're correct. The standard procedure now would be to deploy samplers surrounding the field.

PANEL MEMBER BYUS: Let the wind blow where it may, right?

(Laughter.)

DPR STAFF TOXICOLOGIST BEAUVAIS: And if we were dealing with a compound that didn't have decreasing use of -- you know, it might make sense to do more sampling. But it's not a very high priority today compared to other compounds.

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DPR STAFF TOXICOLOGIST BEAUVAIS: Anyway, the results of the ambient -- or the application site monitoring. Again, this is the background sample. Samples 1 through 4 cover the first 24 hours. Sample 1 is the application, and then this is the time period intervals afterwards.

Again, Sample 4 was taken during the time that the wind direction was out of the southwest -- or, I'm sorry -- out of northwest. And the blue here is the north station and the yellow and red are the near and farther southeast stations.

So just as you predict, methidathion first shows up when the wind direction is favorable to having it show

up in those two stations. And that's the first time also that southeast -- which this would have ordinarily have been the station to detect most of the methidathion -- it shows up during that time. And then the wind direction again switched around to the southwest. And so the north station gets a much larger peak.

So for the exposure assessment I did a 24-hour time-weighted average of these -- of the north station values here. And for the peak I took this peak here, which was the highest measured in the study.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: And this is the same for methidathionoxon. First thing I'm going to point out is that this Y axis is a tenth of -- the scale has been expanded on this one. On the other one it was 3.5. It's now .35 for the top of the axis here. So this a tenth of -- the bars have essentially been magnified by ten compared to methidathion.

And we don't see the oxon at all until the wind had switched around following the application. And so the 24-hour time-weighted average for methidathionoxon is based largely on the detection limit.

And then the peak is -- I took it at the same time that I took the methidathion. So this is my peak here. Because when you add the two together eventually,

which is -- you'll end up with a much higher number that way.

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PANEL MEMBER BYUS: I'm a little confused. Was it the same day or with the same wind or was it a different wind for both of these compounds?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah, these were monitored simultaneously, yes.

PANEL MEMBER PLOPPER: Does that mean you interpret this that there is no oxone until three days after the application?

DPR STAFF TOXICOLOGIST BEAUVAIS: I didn't hear the question.

PANEL MEMBER PLOPPER: Well, if you look at those two slides, I'm trying to figure out what the relationship between the parent compound and the oxone is. Is that -- it doesn't even show -- isn't detectable till three days after the application?

DPR STAFF TOXICOLOGIST BEAUVAIS: And it's hard to know how much of that is the artifact of the wind direction also; that if the winds had been -- if we'd have had a sampler to capture the application directly downwind during the application and immediately following. Because during samples 1 through 3, which were the application and the first six hours afterwards, the wind direction

wasn't -- there was no sampler in the path of the prevailing wind.

PANEL MEMBER PLOPPER: And I thought the north sampler was getting you a sample.

DPR STAFF TOXICOLOGIST BEAUVAIS: It was -- it was getting a methidathion sample. So, yeah.

PANEL MEMBER PLOPPER: But it wasn't getting an oxone sample, so it wasn't there --

DPR STAFF TOXICOLOGIST BEAUVAIS: Right.

PANEL MEMBER PLOPPER: -- for the first three hours?

DPR STAFF TOXICOLOGIST BEAUVAIS: Right.

PANEL MEMBER BLANC: Can you go back a slide.

On No. 5, which is the one that you say you're using?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

PANEL MEMBER BLANC: For No. 5, was that at that point in the direct wind?

DPR STAFF TOXICOLOGIST BEAUVAIS: No, this follows -- go ahead and back up one more.

And No. 5, winds were out of the southwest. But it follows that eight-hour period when winds had been out of the northwest, I guess. I don't know -- I'm not sure exactly what the explanation is for that.

PANEL MEMBER BLANC: Well, let me ask a different

question.

Is there a way that you could model -- since you're measuring not in the direction of wind, it seems that you're not being very conservative in your exposure estimate. Couldn't you use the wind vector as a way -- as a multiplication factor for estimating what the peak exposure would have been, since you could use the combination of the north and southeast -- I mean couldn't you algebraically model what the capture would have been if the wind had been in the right direction, and then come up with a higher number of what the airborne exposure would have been downwind? Isn't that a simple -- aren't there simple models that would do that for you?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: There are models that will do that, and we have used them for application site monitoring. Unfortunately this study doesn't include sufficient information for us to do those models.

PANEL MEMBER BLANC: Because you have northwest but that's not good enough?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Correct. We would need a more precise direction and a more frequent measurement. All we have is the average direction for that sampling period.

In addition, the exact location of the samplers

is somewhat unclear.

PANEL MEMBER BLANC: And yet you're using these data to then derive public health safety estimates. And you're using data which is so frighteningly limited and flawed and then taking conservative -- not conservative -- I'm sorry -- the opposite of conservative interpretations of these data to then say, well, the exposure is such and such. I mean I at least as a sensitivity analysis would like to see what the measurements are like using some more public health conservative estimate of what these airborne exposures are like. I mean this whole thing is scary even for the pesticide presentations that we're used to, I have to say. I'm not happy.

CHAIRPERSON FROINES: I think the point, besides his happiness or unhappiness, to worry about is that this looks like that there is an underestimation of exposure. I think everybody here on this panel would agree to that.

And so the question is -- you know, when we get to the health effects issue we're going to have a discussion about acute toxicity and assumptions that were made with respect to LOEL to NOEL estimation. And this data would suggest that that decision was perhaps not as well -- is not justified. And so the issue's going to come up I think as we get further along.

So I think that Paul's point is important and,

that is, how do we -- how do we make an estimate of exposure given all the problems in the data?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: The point is well taken. As we go through the rest of our presentation, both from Sheryl as well as from Carolyn Lewis, you'll see that even with the underestimation, we do think it meets the criteria for listing as a Toxic Air Contaminant. And so if in fact that occurs, we will definitely do additional monitoring when we get to the mitigation and risk management phase to see exactly what the current exposures are.

CHAIRPERSON FROINES: Randy, but I would actually at this stage not go there yet. Let's leave the designation of Toxic Air Contaminant to the side, and on the assumption that we're still going through a process of evaluation, so that everybody's comfortable.

So within that, I think the best thing to do is to move on, but note that there is concern on the Panel about the exposure estimates. And I think it's shared pretty much by everybody, so that it's uniform.

So why don't we go ahead with that, sort of check -- the box is checked that there is a concern.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. Just to briefly talk about how exposure estimates are calculated.

We estimated -- we assume that 100 percent of the inhaled pesticide is absorbed. And so that absorbed does is air concentration time inhalation rate. I have calculated estimates for infants as well as adults because infants have higher inhalation rates. And for air concentrations, used the highest results that were available. And that was -- for ambient air monitoring, that was the Jefferson School site; for bystander, that was the north application site.

PANEL MEMBER BLANC: Can you just clarify, on the Jefferson School, when you say the highest results, and you had that wide standard deviation. Then there was something about 90th percentile.

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah. And I'm about to explain that actually how that's calculated. That's where I'm going next.

PANEL MEMBER BLANC: Okay.

DPR STAFF TOXICOLOGIST BEAUVAIS: How to calculate the -- how the exposure estimates were calculated. First of all, for acute -- we considered that as lasting from less than a day up until a week, so that's the interval that we're looking at here -- we used the 95th percentile of the distribution of the daily methidathion concentrations in air. This is for the ambient air monitoring. For the application site

monitoring we simply used the peak concentration that was found.

The 95th percentile was calculated assuming a normal distribution. And that was done with the -- by multiplying -- or taking the exponent of the mean -- the estimated mean and the standard deviation of the actual logs of the concentration.

PANEL MEMBER BYUS: I'm still -- so for ambient, and that's site J with a big standard deviation, are you using the highest values -- the 95th percentile highest value or -- is that what that means or not?

DPR STAFF TOXICOLOGIST BEAUVAIS: What that means, it -- I'm not using the highest value. I'm using the 95th percentile.

PANEL MEMBER BLANC: Not the 95th observed. They're using a calculated 95th percentile, if I understand you correctly.

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

PANEL MEMBER BLANC: And --

PANEL MEMBER BYUS: Okay.

PANEL MEMBER BLANC: -- that may be a non-conservative approach. Because since you can't say what days they were actually spraying on in anywhere nearby, and since you have a distribution which suggests that the samples are not coming from the same universe,

rather coming from one universe of time when they were actually spraying and one universe of time when they weren't spraying recently, and you were measuring the sort of tail of what ambient levels are days and days after it, since what you're trying to get at is acute exposure, if there's a bimodal distribution to your data, then you shouldn't use this approach for calculating what your high level exposure are, you're underestimating rather dramatically what your high air exposure is.

Does that make sense? So the 95th --

DPR STAFF TOXICOLOGIST BEAUVAIS: Uh-huh.

PANEL MEMBER BYUS: Right. That's what --

PANEL MEMBER BLANC: What you want is the clustered values on that day when it seemed like there was actual spraying. I don't know how many samples that might be. But in this particular case it may be that you only have three samples that seem to represent that, and you average those three or something. I don't know.

CHAIRPERSON FROINES: Yeah, it does -- because I think he's right. I think that the -- it does look as though there is a bimodal distribution that we're concerned with here.

PANEL MEMBER BLANC: And so it's not simply that it's a skewing that you would correct with a logarithmic correction. It's a different distributional problem to

your data.

What you need to do is do an actual listing of your samples and look at them and see what is the upper, and is there a cluster of samples or are they all the same days?

CHAIRPERSON FROINES: Yeah. If this was an occupational exposure, then the geometric mean would make sense. But this is an environmental exposure where you actually have differing conditions. And in that respect you need to approach it differently.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. For long-term exposures, which are seasonal, greater than a week up to a year; and then annual, which is a per-year exposure. Just used the arithmetic mean of the daily methidathion concentrations -- or methidathionoxon concentrations.

PANEL MEMBER BLANC: And can you explain again, is this -- your standard rationale is defining seasonal in this way?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

PANEL MEMBER BLANC: Because here you really deal with something which is seasonal. You have four months of the year when it's actually used.

DPR STAFF TOXICOLOGIST BEAUVAIS: Um-hmm.

And you're dividing up into a 12 months or 11 months or up to a year.

DPR STAFF TOXICOLOGIST BEAUVAIS: Um-hmm.

PANEL MEMBER BLANC: Or is it the 9 months based on that 5 --

DPR STAFF TOXICOLOGIST BEAUVAIS: It's the 9 months rate -- as far as I'm saying, 9 months.

PANEL MEMBER BLANC: With those 5 percent?

DPR STAFF TOXICOLOGIST BEAUVAIS: Um-hmm.

PANEL MEMBER BLANC: And so it's the average of those 9 months is the value for your seasonal value?

DPR STAFF TOXICOLOGIST BEAUVAIS: No, my seasonal value is -- or my average is average of the ambient air monitoring.

PANEL MEMBER BLANC: For 9 months --

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah.

PANEL MEMBER BLANC: -- or for 12 months?

DPR STAFF TOXICOLOGIST BEAUVAIS: That was done in 1991, in June and July. So I'm taking the average concentration. So foe annual I'm assuming that that's happening -- that those concentrations are received 9 months out of 12.

PANEL MEMBER BLANC: So that is more conservative because you don't have reason to believe that it's that high? You're taking the worse case scenario, the June and

July exposures and then multiplying them times 9 months, is that --

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

CHAIRPERSON FROINES: But you would -- if you were going to do that, you'd prefer to have had the January, February data and not the later data, because it's the early data where you get greater use, right? So you might have greater --

DPR STAFF TOXICOLOGIST BEAUVAIS: That we're getting now. No, that wasn't necessarily the case back in 1991.

PANEL MEMBER BLANC: One thing to comment on in light of the first presentation about temperature and break down -- I mean there's a pretty big difference in ambient temperature in the Central Valley in July as opposed to January, right?

DPR STAFF TOXICOLOGIST BEAUVAIS: Right.

PANEL MEMBER BLANC: So the persistence of the -- airborne persistence would likely be higher in winter months, I suppose.

DPR STAFF TOXICOLOGIST BEAUVAIS: Um-hmm. That's a good point.

PANEL MEMBER ATKINSON: Well, more than likely, in the winter months the compounds would be present in the aerosol phase or on the surfaces, not in the gas phase.

The biggest difference.

CHAIRPERSON FROINES: Do you think -- You could also expect that any vapor phase concentrations might increase, so it would be depending upon the inversion conditions.

PANEL MEMBER ATKINSON: Yeah. But I would -- since the vapor pressure's relatively low I would have expected them in winter time to be more prevalent on surfaces, not in the gas phase.

CHAIRPERSON FROINES: Okay.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. And inhalation rates that were used, these are the standard DPR defaults for the various activity levels for one-hour estimates. But I calculated -- for bystander estimates I used the one-hour heavy activity level. And for all the others it's a daily average.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: And this is an example for the ambient air of what the calculation looked like taking the 95th percentile concentration. And those are adults. I'm using the adult inhalation rate, taking the 95th percentile air concentration times the daily inhalation rate, and come up with that as the exposure estimate.

And for the annual I'm taking the mean concentration times the daily inhalation rate times the high use months, which were 9 times 12 months. So from that this is what the exposure estimate comes out to for the annual absorbed daily dosage.

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DPR STAFF TOXICOLOGIST BEAUVAIS: And these are the estimates that we came up with for acute methidathion and methidathionoxon, and seasonal and annual exposures, and reported in micrograms per kilogram per day.

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DPR STAFF TOXICOLOGIST BEAUVAIS: And for the bystander: For the one-hour absorbed dose -- for the acute estimates, first of all we did do an adjustment to those -- to the concentrations. Because we had a 45-acre application, we adjusted for I guess application rate and field size combined. And what we did was we looked at PUR data and found that the 95th percentile application size is 180 pounds applied per application. And so the difference between 45 and 180 is 4. So we multiplied the -- peak concentration of 3.16 now becomes 12.6. That's the actual value that was used. And at the time we could not determine a -- or I guess a defensible way to compensate for variable wind directions.

We've had a suggestion here, and I guess we'll

look at that further.

PANEL MEMBER BLANC: Can you just go back two slides, I think, to this annual versus nonseasonal, whichever one that would have been.

DPR STAFF TOXICOLOGIST BEAUVAIS: That's annual and acute are what I'm showing here. So the difference between the two is going to be the 9 divided by 12.

PANEL MEMBER BLANC: Right. And so I want to make sure I understood this again correctly. To get the average exposure over 12 months, how did you get that? Was it the average exposure over 12 months?

DPR STAFF TOXICOLOGIST BEAUVAIS: No. What that is -- now, again the average is just the mean concentration that was detected during monitoring.

PANEL MEMBER BLANC: But I thought you had some data where you monitored in different months, every month of the year. And you showed that thing with the 5 percent.

DPR STAFF TOXICOLOGIST BEAUVAIS: And that's use. That's pesticide use.

PANEL MEMBER BLANC: That's use, not monitoring?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah.

PANEL MEMBER BLANC: I'm sorry.

So you only --

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah. So I'm

correcting for the idea that uses a constant throughout the year.

PANEL MEMBER BLANC: The use is not a constant, correct?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah, that use goes up and down. And So I'm -- we're starting with an assumption that when there is higher use, the exposure goes up -- the chances of exposure goes up. And that if there's use that -- we've set a cutoff at 5 percent of the annual use, so that those months where they're getting less than 5 percent, the chances of people being exposed aren't -- you know, on a daily basis or routine basis are much lower.

PANEL MEMBER BLANC: Are zero in your algebraic calculation?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah. So my choices are 0 or 1 here, yeah.

PANEL MEMBER BLANC: Okay. And then the 1 you were multiplying times what? You said the average value for July and August or June and July?

DPR STAFF TOXICOLOGIST BEAUVAIS: That's the average air concentration.

PANEL MEMBER BLANC: Right.

DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. And I don't understand your question.

PANEL MEMBER BLANC: For the 12-month concentration you're assuming three months of zero -- no exposure and 9 months of yes exposure?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah.

PANEL MEMBER BLANC: And the 9 months of yes exposure --

DPR STAFF TOXICOLOGIST BEAUVAIS: -- are at that one rate.

PANEL MEMBER BLANC: -- are based at the level that was measured --

DPR STAFF TOXICOLOGIST BEAUVAIS: -- during the ambient air monitoring in June and July of 1991.

PANEL MEMBER BLANC: Okay. Gotcha.

DPR STAFF TOXICOLOGIST BEAUVAIS: Those was the data that I have.

PANEL MEMBER BLANC: Right. So you took those two and you multiplied either times --

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

PANEL MEMBER BLANC: -- 9 -- well, actually then wouldn't the seasonal and the yearly come out to be exactly the same?

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes, except that the seasonal is without that correction factor. So we're saying daily --

PANEL MEMBER BLANC: Oh, I see. Okay, okay.

--o0o--

DPR STAFF TOXICOLOGIST BEAUVAIS: And for the acute -- again, back with the bystander estimates here. Acute absorbed daily dosage. I took the 24-hour time-weighted air concentration, again multiplied it by 4, and multiplied that by the daily application rate. So we come up with 1.77 micrograms per kilogram per day for infants -- this is for -- these values are for infants.

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DPR STAFF TOXICOLOGIST BEAUVAIS: And this is the concentrations that were estimated for the one-hour absorbed dose. This is a microgram/kilogram per hour assuming an hour of heavy activity level. So the heaviest breathing right there.

And absorbed daily dosage, acute, is .84 micrograms per kilogram per day for methidathion in adults.

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DPR STAFF TOXICOLOGIST BEAUVAIS: We have a lot of uncertainties, and some of which of we've been discussing here. First is assumption is that air monitoring coincided with maximum use. And we don't have any idea about that. We can note that because the use has decreased since '91, it's likely that the concentrations at that time -- or the concentrations are probably lower

than they were during that monitoring period. And, again, referring to Gura's graph where he's showing you how much higher use was in '91 than it has been in recent years.

PANEL MEMBER BYUS: That statement's kind of confusing when you read it. You mean -- you can mean maximum use meaning -- is it being sprayed at the time that we're being monitored? That would be one way you could consider maximum use. But you're talking about yearly use as opposed to, I guess, acute use.

DPR STAFF TOXICOLOGIST BEAUVAIS: Well, it is --

PANEL MEMBER BYUS: I mean in a sense that's what -- I mean it's just a -- if you just clarify that statement a little bit. You follow me? Because that's what I couldn't -- I was having trouble. I had to read it four or five times before I finally --

DPR STAFF TOXICOLOGIST BEAUVAIS: Well, I hope it's clear in the exposure assessment, because they're all paraphrased.

And then exposure estimates are based on data from one site in the case of the ambient -- for ambient air.

CHAIRPERSON FROINES: Isn't it possible -- I understand the point you're trying to make here. And maybe this is what you were saying. But it seems like given a specific application at one time on an almond

field, you could have significant amounts that were being applied irrespective of what's happened between 1991 and 2003.

DPR STAFF TOXICOLOGIST BEAUVAIS: Yes.

PANEL MEMBER BYUS: That's what I'm saying.

DPR STAFF TOXICOLOGIST BEAUVAIS: Yeah, okay. Yeah, individual application didn't decrease. Gura was showing --

CHAIRPERSON FROINES: And if you're setting a -- part of the basis for defining this is the toxic air contaminant is based on an acute exposure, then you have all the potential ingredients for that problem actually occurring, I think.

So that's true as a generalization. But in terms of a specific use pattern at a given time, that may not be as relevant.

PANEL MEMBER PLOPPER: Actual exposure could be the same where it's being applied.

That's what I'm trying to get at, regardless of how much is totally used, depending on where you measure ambient air next to where it's being applied.

CHAIRPERSON FROINES: Well, and it's particularly important given the health outcome, which is an acute toxicity, that -- you know, you may have a higher exposure at some point on an individual application under certain

conditions.

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DPR STAFF TOXICOLOGIST BEAUVAIS: Okay. And with regard to application site data, maximum concentration was probably not captured in the monitoring study. And the size of the application was not the maximum size that -- in current monitoring they would monitor a maximum sized application with the highest application rate and so forth. So I did an adjustment to attempt to compensate for that, multiply it by 4.

And also in the case where I had non-detects in methidathion and methidathionoxon -- well, this is for the application site data, this only affects the oxon -- I substitute half the detection limit. And the way that it works out, the result is that the -- if I were to use the limit of detection or the limit of quantification, my average concentration would be higher than, but my acute would go down because my variance would go down.

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DPR STAFF TOXICOLOGIST BEAUVAIS: And other uncertainties in these estimates include the assumption of 100 percent absorption. And we have no data about that, so we don't know if that's an overestimate or not. Inhalation rate defaults are based on limited data, so -- and also the pesticide use report data were used to

estimate months when exposure would be considered most likely. And those are aggregate exposures across a county, you know, on a county-wide basis. So we wouldn't -- we have no idea how they relate to individual exposures.

And that's it.

CHAIRPERSON FROINES: And there's no -- so there's no attempt to address dermal exposure?

DPR STAFF TOXICOLOGIST BEAUVAIS: Not in the air -- not in the ambient air and bystander. Now, there are occupational sections in here, occupational handle and reentry.

CHAIRPERSON FROINES: Well, an interesting question about whether there are -- whether the public is exposed dermally or whether it's only occupational. And in our studies in Mexico that we did, we found quite significant dermal uptake in families living near fields. And so it's not -- we have tons of data on dermal uptake associated with families in some proximity to agricultural sites. So it's not something that one can -- and of course then you also have the issue of what happens on roads where you have -- do you have any -- or the pesticide that gets re-entrained. So that there are some other possibilities, when you think about the whole picture.

Thank you very much.

DPR STAFF TOXICOLOGIST BEAUVAIS: Thank you.

CHAIRPERSON FROINES: We realize that it's the data that's problematic. So you shouldn't worry about all the questions.

Do you want to break for lunch? It's 12:30?

PANEL MEMBER PLOPPER: That would be fine.

PANEL MEMBER BYUS: Yes.

CHAIRPERSON FROINES: Everybody?

Yes, yes, yes.

Stoic.

(Laughter.)

CHAIRPERSON FROINES: Joe?

PANEL MEMBER LANDOLPH: (Nods head.)

PANEL MEMBER BLANC: 1:15?

CHAIRPERSON FROINES: 1:15, yeah.

(Thereupon a lunch break was taken.)

AFTERNOON SESSION

CHAIRPERSON FROINES: We're officially reconvening the Scientific Review Panel.

And the next presentation will be on the health effects.

(Thereupon an overhead presentation was Presented as follows.)

DPR STAFF TOXICOLOGIST LEWIS: Okay. I'm Carolyn Lewis, and I'm the author of the Risk Characterization Document for methidathion, or Supracide.

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DPR STAFF TOXICOLOGIST LEWIS: The risk assessment process consists of four major compartments: Hazard identification, dose response assessment, exposure assessment, and risk characterization.

The hazard identification section identifies the adverse effects of associated with exposure to a chemical.

The dose response assessment then determines the "no observed effect" levels associated with these adverse effects.

The exposure assessment estimates human exposure levels.

And the risk characterization brings together the information in the dose response assessment and the exposure assessment to estimate what the risk is in humans

for adverse health effects.

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DPR STAFF TOXICOLOGIST LEWIS: The Risk Characterization Document for methidathion is a comprehensive risk assessment which addresses risk assessment requirements set forth in the Toxic Air Contaminant Act as well as health risk from other exposures scenarios.

This risk assessment document consists of six major sections: The introduction, toxicology profile, risk assessment, risk appraisal, tolerance assessment, and reference concentration.

The risk assessment section includes threes sections. The hazard identification includes the dose response assessment, the exposure assessment section and the risk characterization.

The tolerance assessment section will not be discussed in this presentation because it only has to do with dietary exposure.

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DPR STAFF TOXICOLOGIST LEWIS: The toxicology profile contains all the available toxicity studies for methidathion, including acute toxicity studies submitted to DPR by registrants to register various formulations as well as longer term studies conducted by registrants that

are required under SB 950.

In addition, any available literature studies are included in the toxicology profile.

In general, greater weight is given to the registrant studies that meet FIFRA guidelines because these studies have been conducted according to good laboratory practice guidelines and follow protocols that are designed to establish a NOEL for the adverse effects identified. In addition, these studies include individual animal data in the reports which are often critical in interpreting the findings from these studies.

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DPR STAFF TOXICOLOGIST LEWIS: However, the literature studies provide important supplemental information particularly with regards to the mechanism of action, and they can also be used as a critical NOEL in the risk characterization if they evaluate an endpoint that has not been examined in the guideline-type studies and appears to be a scientifically valid study.

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DPR STAFF TOXICOLOGIST LEWIS: The toxicology profile is organized into eight sections based primarily on the type of guidelines studies that we receive from registrants.

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DPR STAFF TOXICOLOGIST LEWIS: The first section in the toxicology profile is pharmacokinetics section where we summarize the absorption, distribution metabolism, and excretion of a chemical.

For methidathion the oral absorption is nearly a hundred percent, with the majority of it being excreted within 24 hours.

There is no inhalation absorption data for methidathion. So the assumption was made that a hundred percent was absorbed.

The distribution and metabolism of methidathion was fairly extensive, with very low residues detected seven days after exposure. And I'll discuss the metabolism a little bit more in the next slide.

Most of methidathion is excreted in the urine and through the lungs as CO2. Very little was found in the feces.

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DPR STAFF TOXICOLOGIST LEWIS: This slide represents the propose metabolic pathway for methidathion based on the urinary metabolites identified. Methidathion -- excuse the -- the print on this didn't come out very well. It's what happens when you cut and paste.

Methidathion is represented in the top center

there. The oxygen analog is shown at upper left.

Other metabolites that were identified: On the lower right are the sulfide, sulfoxone and the sulfone. Various conjugates are shown on the left-hand side. A couple other urinary metabolites included the RH -- what they call the RH compound and the desimonomethyl derivative.

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CHAIRPERSON FROINES: Just one comment.

DPR STAFF TOXICOLOGIST LEWIS: Yeah.

CHAIRPERSON FROINES: And so -- I don't want to talk about it today, but maybe for the next meeting where we'll take up the topic again.

If you could look at the metabolites, you all at DPR, and ask this question: Which of the metabolites do you think could have electrophilic activity in the chemical sense? Because since carcinogenicity is one issue, electrophilicity is -- in a metabolite is a relevant issue. And so something to think about in terms of possible pathways -- mechanistic pathways.

DPR STAFF TOXICOLOGIST LEWIS: Actually I meant to mention in that previous slide to -- that the presumed active metabolite is the oxygen analyte. But you had already sort of touched on that on previous topics.

CHAIRPERSON FROINES: Well, I think it's the -- I

think that it's the active metabolite for the organophosphate toxicity --

DPR STAFF TOXICOLOGIST LEWIS: -- the neurotoxicity, yeah. It may not be for the carcinogenicity.

CHAIRPERSON FROINES: -- but not for binding with macromolecules.

DPR STAFF TOXICOLOGIST LEWIS: Yes, exactly.

Okay. Next slide.

This is a diagram of a neuromuscular junction.

The primary mechanism of action for methidathion is the inhibition of the enzyme acetylcholinesterase in the peripheral and central nervous system. Acetylcholinesterase is represented by the pink dots on the motor end-plate in this diagram.

As an impulse travels down to the axon terminal, it stimulates the release of acetylcholine, which is a neurotransmitter, into the synapse, which then binds with the receptors on the motor end-plate. This then stimulates the muscle. The acetylcholinesterase terminates this muscle stimulation by cleaving the acetylcholine. And the acetylcholinesterase in the central nervous system functions in a similar manner between synapses.

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DPR STAFF TOXICOLOGIST LEWIS: The inhibition of cholinesterase by methidaoxon produces a variety of cholinergic signs. The classic signs are excessive salivation, excessive lacrimation, excessive urination, and diarrhea. This is sometimes referred to as the Sled Syndrom.

Other cholinergic effects include headaches, pinpoint pupils, nausea, vomiting, difficulty in breathing, muscle twitching, tremors, and convulsions.

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DPR STAFF TOXICOLOGIST LEWIS: In general, DPR considers brain cholinesterase inhibition to be an adverse effect because it is the primary target site. The toxicological significance of the blood cholinesterase is less certain. However, plasma cholinesterase appears to be involved in the detoxification of various plant toxins and certain drugs. Even less is known about the function of red blood cell cholinesterase. However, several regulatory agencies use red blood cell cholinesterase as a surrogate for peripheral nervous system cholinesterase, which is often not available.

For these reasons the NOELs for both blood and brain cholinesterase inhibition have been identified in this report.

It should be noted that generally blood

cholinesterase inhibition is a more sensitive endpoint for most cholinesterase inhibitors. But with methidathion the brain cholinesterase inhibition was often the more sensitive endpoint.

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DPR STAFF TOXICOLOGIST LEWIS: So in the acute, subchronic and chronic studies, we saw cholinesterase inhibition as well as peripheral and central nervous system neurological signs. In addition, there were a few studies in the literature that indicate there was lipid peroxidation in some issues with acute and subchronic exposure. Evidence of hepatotoxicity was also seen in acute and subchronic and chronic studies.

Reduced body weights and food consumption were only seen with repeated exposure to methidathion as well as hematological changes, which were suggestive of anemia.

An increase in liver tumors was seen in male mice only with long-term or lifetime exposure to methidathion.

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DPR STAFF TOXICOLOGIST LEWIS: There were other adverse effects identified in the more specialized toxicity studies, including evidence of genotoxicity, reproductive toxicity and developmental toxicity.

The vast majority of the genotoxicity data were negative. However, there were a few positive studies,

including a gene conversion/forward mutation assay with yeast cells and an in vitro sister chromatid exchange assay with Chinese hamster V79 cells.

In the reproductive toxicity study in rats, most of the effects were typical of subchronic exposure. However, there was evidence of reduced mating and more maternal care.

In the developmental toxicity study, most of the signs again were typical of acute and subchronic exposure, except there was evidence of reduced ossification of the sternebrae.

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DPR STAFF TOXICOLOGIST LEWIS: So the next major section in the risk characterization document is the risk assessment section.

The first section is the hazard identification, which is divided into acute toxicity, subchronic toxicity, and oncogenicity.

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DPR STAFF TOXICOLOGIST LEWIS: First off I'd like to point out that -- or emphasize, I guess as you had noted earlier, there is no toxicity data for the oxone -- the methidaoxon. There was nothing in the literature. There was nothing that we received from registrants.

So the assumption was made that the oxone was

equally toxic to methidathion. And this obviously underestimates the toxicity of the oxone since it is the presumed active metabolite, at least for neurological effects.

CHAIRPERSON FROINES: Since it's so -- since the issue of oxone is a very obvious one given the other pesticides with peroxon, what have you, why do you think that nobody's ever required industry to conduct studies on that? Because it's such a gap -- obvious gap.

DPR STAFF TOXICOLOGIST LEWIS: Yeah, it's an obvious gap, yeah. I'm not sure why --

CHAIRPERSON FROINES: But EPA hasn't required --

DPR STAFF TOXICOLOGIST LEWIS: Hasn't requested it. I guess we could ask the registrant if they have any data. But I presume it's voluntary, you know, in terms, you know, whether they buy it or not.

CHAIRPERSON FROINES: Well, if there's a data gap, it's worth asking, because -- I don't know in terms of requiring. But it seems to me that it's such an obvious missing link, that it's worth thinking about.

But go ahead.

DPR STAFF TOXICOLOGIST LEWIS: Okay. This table is a simplification of Table 20 in the risk characterization document, which shows the studies that -- the main studies that were considered for selecting an

acute NOEL to evaluate acute exposure to methidathion.

This includes only the guideline-type studies, including an acute neurotoxicity study and several developmental toxicity studies.

Only the maternal effects observed within the first few days of exposure in the developmental toxicity studies were considered acute. Most of the fetal effects were considered acute, assuming that they were the result of a single exposure.

Of these studies, only two of them actually met FIFRA guidelines: The acute neurotoxicity study at the top and the last developmental neurotoxicity study at the bottom.

The lowest LOEL seen in these studies was in the acute neurotoxicity study. Based on the reduced cholinesterase inhibition in the cortex of males. And this study was also the most thorough evaluation of the neurotoxic potential of methidathion. And for these reasons it was selected as the definitive study for evaluating acute exposure to methidathion.

Unfortunately, a NOEL was not observed in this study. So it was divided by an uncertainty factor of 3.

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PANEL MEMBER BLANC: Excuse me. When would you like to have the discussion of the selection of the

uncertainty factor?

DPR STAFF TOXICOLOGIST LEWIS: Well, I'm going to go over my rationale. And you can stop me at any point or wait until I finish.

PANEL MEMBER BLANC: Okay.

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DPR STAFF TOXICOLOGIST LEWIS: Okay. There are several reasons why an uncertainty factor of 3 was used instead of the default value of 10.

One was the brain cholinesterase inhibition was only observed in one sex in one region at the LOEL. The cortex did not appear to be uniquely sensitive to cholinesterase inhibition when you looked at the higher dose levels.

There was also not a significant increase in neurological signs until you increased the dose level 8-fold.

Also, females appeared to be more sensitive than males at the higher dose levels based on their level of brain cholinesterase inhibition and the incidence of neurological signs.

And, finally, a NOEL of .2 milligram per kilogram/day was observed at two weeks in the 90-day neurotoxicity study for this same endpoint, inhibition in the cortex, in males.

So if you want to comment now, this would be a good time.

PANEL MEMBER BLANC: One of the things that I would say is that, having read the OEHHA response, something that struck me about both their response and the initial calculation was why -- did the data not allow a benchmark approach?

DPR STAFF TOXICOLOGIST LEWIS: I have a slide that actually -- since that's going to -- I was going to come into that in the risk appraisal.

But it was problematic. One of the problems with a benchmark dose approach was selecting a threshold for -- what you have to do with continuous data. And regional brain cholinesterase data -- we looked at in-house data when we were examining our cholinesterase policy. And while whole brain data has very small variation compared to, say, the plasma and red blood cell, regional brain cholinesterase data varied significantly. And unfortunately we didn't have a large number of studies like we had with the whole brain to get a comfort level of selecting a level of inhibition that we felt comfortable as calling a threshold.

So the only option I could come up with was using the coefficient of variation from the control -- the male control animals in that study as a threshold. And if I

did that, you come up with a lower limit on the benchmark dose of .38 milligram per kilogram, which is fairly similar to dividing by uncertainty factor of 3.

PANEL MEMBER BLANC: And what was the coefficient of variation for cholinesterase?

DPR STAFF TOXICOLOGIST LEWIS: It was 23 percent in that, which seems kind of high. I mean for whole brain you usually see something that's more around 10 percent. But that was not -- you know, that --

PANEL MEMBER BLANC: And what would the -- if you used 10 percent as your basically "no effect" threshold, what would your calculation of your benchmark value have been, extrapolating down the curve and using the 95 percentile --

DPR STAFF TOXICOLOGIST LEWIS: It would obviously be lower. I couldn't tell you off the top of my head since I haven't done that calculation. But --

PANEL MEMBER BLANC: Well, again, because we're talking about being public health conservative and because I think that there's certainly a reasonable argument for the 10-fold safety factor as well, I thought the OEHHA argument was fairly strong. I think that doing that calculation would be --

DPR STAFF TOXICOLOGIST LEWIS: So would you say that that would be better over dividing by 10?

PANEL MEMBER BLANC: Well, it may give you something which is somewhat in between the 3 and the 10 value.

DPR STAFF TOXICOLOGIST LEWIS: Yeah. You know, I guess I had a problem with using the 10 because it would put the NOEL lower than the subchronic NOEL for the exact same endpoints. So I felt it needed to be at least as high as the subchronic NOEL. And assuming that there is maybe some bio-accumulation with repeated exposure, it seemed logical that you might have a NOEL that's slightly higher than .2 for an acute exposure. And that was --

PANEL MEMBER BLANC: Well, I don't know if that's -- I mean I don't know if we don't have to say that that's, you know, necessarily the case. But I guess another corollary to my question, you -- the reduction was 59 percent of baseline as to cholinesterase in the cortex.

DPR STAFF TOXICOLOGIST LEWIS: Uh-huh.

PANEL MEMBER BLANC: But, first of all, this is the whole cortex, right?

DPR STAFF TOXICOLOGIST LEWIS: Well, they take a section of it and measure --

PANEL MEMBER BLANC: But I mean it's the cortex?

DPR STAFF TOXICOLOGIST LEWIS: Yeah.

PANEL MEMBER BLANC: So to talk about a regional brain effect in the cortex isn't exactly the same thing as

talking about a regional brain effect in the hypothalamus or something. I mean you're talking about --

DPR STAFF TOXICOLOGIST LEWIS: -- a big section.

PANEL MEMBER BLANC: -- the cortex, you know. So that's one thing.

But the second thing is, when -- in these other studies when you're talking about an effect, is it defined as a statistically significant difference in cholinesterase depression?

DPR STAFF TOXICOLOGIST LEWIS: Yes.

PANEL MEMBER BLANC: So, for example, in the other sections of brain that were tested, it was only in the cortex. But there were other sections that were tested?

DPR STAFF TOXICOLOGIST LEWIS: Yes.

PANEL MEMBER BLANC: And the depression in cholinesterase was not statistically significant?

DPR STAFF TOXICOLOGIST LEWIS: Yes.

PANEL MEMBER BLANC: But was there a depression in cholinesterase?

DPR STAFF TOXICOLOGIST LEWIS: I have some slides in another file here that I --

PANEL MEMBER BLANC: Because I think an important question here is not confusing --

DPR STAFF TOXICOLOGIST LEWIS: I don't recall. I

think there may be --

PANEL MEMBER BLANC: -- the issue of no effect with a statistically significant effect. Because you have small numbers. And what we're trying to avoid here is a beta error, not so much an alpha error, again from a public health protection point of view.

DPR STAFF TOXICOLOGIST LEWIS: I'll jump ahead a couple slides.

Okay, there.

Okay. So there you have the -- the cortex is actually the cortex with a hippocampus included there. And --

CHAIRPERSON FROINES: What does that -- I'm sorry. I'm trying to go through this document, to no avail.

What is the table --

DPR STAFF TOXICOLOGIST LEWIS: -- oh that's from?

Yeah, that's a simplification, because the table has a little bit --

CHAIRPERSON FROINES: What's the table --

DPR STAFF TOXICOLOGIST LEWIS: It's in the toxicology profile. And it should be page 62 on the May 25th draft.

Anyway, you do I guess -- in the cerebellum you do see what looks like it could be a reduction there at 88

percent of the control activity. It doesn't reach statistical significance. And it's hard to say whether that's a normal -- you know, just statistical variation, because, if you -- for example, if you look at the serum, if you go over there in the females, the activity looks like it's reduced. But it's -- basically I've got a flat dose response.

PANEL MEMBER BLANC: But let's look at -- I think more importantly is look at the -- how many animals per test dose are there here roughly? Do you have any sense --

DPR STAFF TOXICOLOGIST LEWIS: Well, one of the things, they have to be careful -- and I'd have to go back to the report to verify this -- is they don't always do the cholinesterase in all animals that they put through the neurobehavioral test.

PANEL MEMBER BLANC: Right. But let's just look at the --

DPR STAFF TOXICOLOGIST LEWIS: Yeah, ten animals per sex per dose were measured for cholinesterase.

PANEL MEMBER BLANC: Well, I mean if you looked at -- the argument that you make is that, well, we're discounting the reduction because we don't see reduction in the female mice. But in fact you see a very similar dose response. It's just that probably with those small

numbers, you know, due to statistical chance, the 87 percent, which is not a hundred percent, we'd have them come back to normal. It certainly looks like that's not a "no effect" level at all. It's just not statistically significant for that one group of rats.

So if you're going to make your argument that, well, this is some kind of a variance because we see it in males -- that is one of your arguments for using a 3.

DPR STAFF TOXICOLOGIST LEWIS: Well, I'm not saying that it's an aberration. I'm just saying --

PANEL MEMBER BLANC: No, but you're saying it appears to be a gender-specific effect.

DPR STAFF TOXICOLOGIST LEWIS: Oh, I see. Oh, okay.

PANEL MEMBER BLANC: What I'm saying, this doesn't convince me --

DPR STAFF TOXICOLOGIST LEWIS: You're not convinced. Okay.

PANEL MEMBER BLANC: -- that it's gender specific with 10 test animals in each thing.

And I do think it would make -- I would like to see at least the benchmark calculation with a, you know, 90 percent cholinesterase as being your threshold.

CHAIRPERSON FROINES: I still can't find this graph.

DPR STAFF TOXICOLOGIST LEWIS: Okay. Page 62 in the toxicology profile.

CHAIRPERSON FROINES: Page 62 --

DPR STAFF TOXICOLOGIST LEWIS: -- of the risk -- volume 1 of the risk characterization document.

Table 17.

PANEL MEMBER BLANC: It's page 61 actually.

CHAIRPERSON FROINES: No, that's a dog study.

DPR STAFF TOXICOLOGIST LEWIS: Uh-oh, there's a blank page there.

PANEL MEMBER BLANC: It's not there.

DPR STAFF TOXICOLOGIST LEWIS: The page breaks got all -- okay. Oh it's further. I see it.

CHAIRPERSON FROINES: Yeah, I got it. It's on page 82.

DPR STAFF TOXICOLOGIST LEWIS: Yeah, the page break got all mess up.

CHAIRPERSON FROINES: It's at page 82.

DPR STAFF TOXICOLOGIST LEWIS: Yeah, 82. Something must have happened in the conversion to the PDF.

Okay. Okay. Well, I'll make a note of that and take that into consideration.

CHAIRPERSON FROINES: This is a crucial issue. And I don't know how we want to address it right now. I guess my inclination would be to have taken Paul's

comments. But I know I have things to say about it, and I assume Charlie will and others. Because it seems to me this is a fundamental issue in this document. And if we talk about nothing else, we need to come to some consensus on how we think this should be approached.

So I guess what I would argue at this point, unless the Panel disagrees strongly, is why don't we go -- continue going through your presentation and then we'll take it up probably next time. And in the meantime you can look at the benchmark issue that Paul's raising.

Is that reasonable?

DPR STAFF TOXICOLOGIST LEWIS: Okay.

CHAIRPERSON FROINES: You're comfortable, Paul, with taking -- going through her slides at this point?

PANEL MEMBER BLANC: Yeah.

CHAIRPERSON FROINES: But I can say, it's going to become a point of significant contention, I think.

--o0o--

DPR STAFF TOXICOLOGIST LEWIS: All right. This is now a simplification of Table 21 in the RCD. And it includes only the guideline studies that met FIFRA guidelines or were found acceptable by FIFRA guidelines. This includes several developmental toxicity studies, a reproductive toxicity study, and a 90-day neurotoxicity study.

In the developmental toxicity study, only the maternal effects that were seen after several days of exposure were considered subchronic effects.

In the reproductive toxicity study all of the parental effects and all of the effects in the pups were considered subchronic.

CHAIRPERSON FROINES: I should say, parenthetically, that I think that one of the most significant problems as we go through this is this gavage as to the method of introduction of the chemical to the body. And that I would predict much -- perhaps more significant toxicity if we had talked about it in terms of inhalation. And so because the gavage method obviously has its own limitations and we need to come -- we can come back to that.

But go ahead.

DPR STAFF TOXICOLOGIST LEWIS: Yeah, unfortunately there were no inhalation studies available at all from the --

CHAIRPERSON FROINES: Yeah. And the gavage, it means that you're going to end up with a -- well, anyway, let's not get into it. We'll talk about it later.

PANEL MEMBER BLANC: But, again, parallel with the discussion we just had, I think -- just like you need to hear something more now.

In your table as you show it you have the effects in bold that are the -- that were the low level effects, right?

DPR STAFF TOXICOLOGIST LEWIS: Yes.

PANEL MEMBER BLANC: So it's, for example, around 75 percent inhibition at the 26 level in 90 days, right?

DPR STAFF TOXICOLOGIST LEWIS: Right.

PANEL MEMBER BLANC: And in the data themselves, was there still some inhibition but not statistically significant in .2? You're calling it a "no effect" level. Is that because it's not statistically significant or because there was no effect?

DPR STAFF TOXICOLOGIST LEWIS: It was because it was not statistically significant. There might have been some low level inhibitions and --

PANEL MEMBER BLANC: Can we see what that looks like?

DPR STAFF TOXICOLOGIST LEWIS: Yeah, I think I have the table of that.

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Right here?

DPR STAFF TOXICOLOGIST LEWIS: Yeah, In that other file.

PANEL MEMBER BLANC: If that's okay with the group. Because I think it's relevant.

DPR STAFF TOXICOLOGIST LEWIS: Okay. In this one you see the red blood cell cholinesterase inhibited also at the LOEL as well as inhibition in the striatum.

Now, at two weeks you only see -- and I just show this for the cortex -- you see the inhibition in males that's statistically significant. You did not see any other differences in -- statistically significant difference in the brain cholinesterase inhibition at two weeks in the other regions.

However, by 90 days, or 13 weeks, you started to see inhibition in the striatum in females as well as the hippocampus.

There is I guess at three what looks like it could be a significant -- or not significant -- a reduction in activity in females and -- that's 13 weeks -- and also in the males in the cortex.

PANEL MEMBER BLANC: So this is the detail data from the --

DPR STAFF TOXICOLOGIST LEWIS: Yeah, it's simplification, because I cut out some of the time points just because it was impossible on the slide like this to include it all. But it does show -- because actually they measured the cholinesterase activity 2 weeks, 4 weeks, 8 weeks and 13 weeks. So I'm just showing the 13 weeks except for the cortex, where I showed the 2 weeks one.

PANEL MEMBER BLANC: So every else here is 13 weeks?

DPR STAFF TOXICOLOGIST LEWIS: Yeah, so everything else is 13 weeks.

PANEL MEMBER BLANC: So at -- it's hard to argue that there's a difference between the value of 2 weeks and 13 weeks for cortex in the males. And that's the no effect -- that's the low effect level --

DPR STAFF TOXICOLOGIST LEWIS: Yeah, 10 -- yeah, I've got the --

PANEL MEMBER BLANC: So the 3 -- the 3 column is your "no effect" column, is that --

DPR STAFF TOXICOLOGIST LEWIS: Yeah, yeah. I've got the milligram per kilogram dosage underneath the PBMs, which is the top number.

PANEL MEMBER BLANC: Well, I would say that if you're going to do the benchmark exercise with the other values, you probably would want to do a parallel benchmark exercise with these data, at least to see what it's giving you.

CHAIRPERSON FROINES: But irrespective of that, Paul, we have a -- we obviously have a problem here of the classic debate about P values is to find public health endpoints.

PANEL MEMBER BLANC: Well, that would be around

that, wouldn't it?

CHAIRPERSON FROINES: Well, if -- well, but -- let's see what the benchmark shows. But irrespective, respective I don't -- I would not take three parts per million as a "no effect" level.

PANEL MEMBER BLANC: Well, I mean that's what I'm saying. That's another way of -- I'm not disagreeing with you. It may be a "no effect" level, but it's pretty close to being a "low effect" level, if you look at this. Because if I use a cutoff of 90 percent as being normal, then I haven't reached that at the three parts per million here, because I haven't come up to -- I haven't come to a hundred percent certainly. But I --

CHAIRPERSON FROINES: Right.

DPR STAFF TOXICOLOGIST LEWIS: One of the problems that's going to come up with this study is, because you have several regions that are affected, which one are you going to pick. I guess I would have to do all of them and see what comes out lowest?

PANEL MEMBER BLANC: Well, that would be the most conservative, wouldn't it?

DPR STAFF TOXICOLOGIST LEWIS: Yeah.

CHAIRPERSON FROINES: I think that I would be willing to make an argument that this data and the previous data shows that three parts per million is a low

effect level, if you ask the question from a conservative standpoint. In other words, is there a trend? And the answer is clearly there's a trend. And so given the uncertainties in exposure, given the uncertainties in the root of administration, and on -- we can go on and on, I think one would be very -- I would be very hesitant to think that this would be considered, as OPHTHALMIA said, endpoint was considered to be mild. But let's come -- we'll come back to it. But I think this is an important issue.

DPR STAFF TOXICOLOGIST LEWIS: Okay. I assume there aren't any more questions about the selection of the acute neurotoxicity study, other than how the NOEL was derived. So I'll go on to the chronic toxicity studies.

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DPR STAFF TOXICOLOGIST LEWIS: This table is again a simplification of the table in the risk characterization documents, Table 22. And it only includes those registrant studies that met FIFRA guidelines, with the exception of the last study that was done, a non-guidelines study in monkeys. And this was only included for comparison with the other species.

The lowest NOEL and LOEL observed with chronic exposure to methidathion was in the dogs -- in the 1-year dog study, based on an increase in liver enzyme levels in

the serum and an increased incidence of histopathological lesions in the liver.

This NOEL was fairly similar to the NOEL that was observed in rats. However, rats exhibited more signs of neurotoxicity at the LOEL compared to dogs. And this may be an indication and difference in the metabolism between the two species. Maybe rats are forming more of the neurotoxic metabolite, where dogs are forming more of the hepatotoxic metabolite.

So the dog study was selected -- because it had the lowest NOEL and was an acceptable guideline study, it was selected as the definite study for evaluating chronic exposure to methidathion.

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DPR STAFF TOXICOLOGIST LEWIS: There is evidence of increased liver tumors in two oncogenicity studies in mice -- in male mice. One of these met FIFRA guidelines.

Not only was there a dose-related increase in liver tumors in these studies. But in one study there was an increase in the multiplicity of the tumors and the proportion of malignant tumors, as well as a decrease in the time to tumor.

While the vast majority of the genotoxicity data for methidathion were negative, there were a few positive studies.

A nongenotoxic mechanism may be involved in the development of these tumors because of the very high incidence of chronic hepatitis and bile stasis in the male mice compared to females. Nearly 98 percent of the animals had hepatotoxicity, a chronic hepatitis, and bile stasis; whereas the females, only 24 percent at the same dose level had chronic hepatitis. Unfortunately the registrants did not submit any mechanistic studies to support a threshold mechanism.

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DPR STAFF TOXICOLOGIST LEWIS: Consequently, DPR assumed that there was no threshold for the oncogenicity, and used a linear low-dose extrapolation method to estimate the cancer potency due to --

CHAIRPERSON FROINES: Can I interrupt you for a second?

DPR STAFF TOXICOLOGIST LEWIS: Yes.

CHAIRPERSON FROINES: I wonder if you could comment. You have this interesting paragraph on page 16 where you talk -- a study by Nehéz looked at the lymphocytes of 55 male agricultural workers for chromosomal aberrations. And you say that -- "But there was a significant increase in chromosome aberrations in 14 men working in open fields.

And so one of the problems with this approach to

genotoxicity is that it's a little bit out of the 1970s. I mean it's sort of the EPA defines 100 short-term tests and everybody sort of does them and then you have these long tables of whether they're positive or negative. And if you look at molecular approaches to mutational frequencies now, you would argue that that sort of traditional tests really don't stand up to modern molecular biological evaluation of gene -- of effects on genes.

And so there's the problem of sort of giving almost too much weight to some body of tests that are almost anachronisms in some way, although are useful. And I could give you examples of, you know, the studies that were done on the big blue mouse on diesel where you found all sorts of mutational -- mutations occurring that were not seen elsewhere. So there's that issue.

But the other question is: How would you interpret this particular clinical finding in humans relative to your -- all your sort of more classic tests?

DPR STAFF TOXICOLOGIST LEWIS: Well, I'm having a little trouble finding that.

CHAIRPERSON FROINES: It's on page 16 of the draft that --

DPR STAFF TOXICOLOGIST LEWIS: Oh, here we go.

I think one of the problems with this study is

you don't know what these workers were exposed to. You don't know if it was, you know, just methidathion. I mean they -- methidathion was one of the things, but it wasn't the only thing that they were exposed to. So these chromosomal aberrations could be due to any, you know, one of the pesticides that they were working with. So it's probably -- it's difficult to interpret. I mean it might support that it is genotoxic, but you couldn't say with any certainty that that was --

CHAIRPERSON FROINES: Well, I think that there -- the point that Paul's been making all along has been we need to be careful not to dismiss things where we don't have -- where things aren't perfect, as opposed to giving them too much weight at the same time. In other words, we need to take -- we need to say, "Okay, how are we going to approach this evaluation." And you put it in. I just read it.

And so the only point I'm making is I -- you know, one would have to ask what other pesticides were they exposed to? Is there any evidence in chromosomal damage from those pesticides? In other words you have a positive study and then you say but there are other -- may be other exposures. Well, that will dismiss it, but it doesn't necessarily justify its dismissal. And we just need to be careful about that.

DPR STAFF TOXICOLOGIST LEWIS: Yeah. I actually did not even think about discussing this in the weight of evidence for oncogenicity. And I certainly can add a discussion of that in there. And I'll look at the other pesticides that they were exposed to.

CHAIRPERSON FROINES: Well, it would be useful to look and see what other pesticides they may have been exposed to.

And, secondly, it is a finding of chromosomal aberrations. And in your document -- in your presentation, you're saying that there is some evidence -- there may be, or there may not be, some evidence of chromosome. And so to the degree that they have any commonality, then they're not -- then one wants to not just ignore it.

DPR STAFF TOXICOLOGIST LEWIS: Okay.

CHAIRPERSON FROINES: And not make too much of it either.

DPR STAFF TOXICOLOGIST LEWIS: Yeah, not put -- yeah.

Okay. So as a result, the linear low-dose extrapolation approach was used to estimate cancer potency. Because of the incidence -- a higher incidence of mortality at the high dose level in this study, the one that met FIFRA guidelines that we used to calculate the

cancer potency, we used a time-to-tumor model. The potency estimated with this approach ranged from .34 per milligram per kilogram/day for the maximum likelihood estimate up to .53 per milligram per kilogram/day at the 95th percent upper bound.

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DPR STAFF TOXICOLOGIST LEWIS: Oh, and I should point -- could you go back to that.

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DPR STAFF TOXICOLOGIST LEWIS: I should point out that U.S. EPA concluded that methidathion was a possible human carcinogen. However, they did not consider the weight of evidence to be sufficient to calculate a cancer potency. They didn't think there was an increase in the proportion of malignant tumors or a shortening of the time to tumor. And for that reason, they I guess didn't feel like the evidence was strong enough to calculate a cancer potency.

CHAIRPERSON FROINES: Well, I should say just in rebuttal, friendly rebuttal, EPA has not yet developed a risk assessment and unit risk value for diesel.

DPR STAFF TOXICOLOGIST LEWIS: Oh.

CHAIRPERSON FROINES: And you heard today that we won a court decision because we did take the step to develop a unit risk factor.

So I think that the fact that EPA hasn't done it doesn't necessarily mean -- that that means that one couldn't do one and shouldn't do one.

DPR STAFF TOXICOLOGIST LEWIS: Yeah. That reminds me, I did do the unit risk calculations for methidathion. They're in the document. I didn't have them on my slides. So if you want to see them, they're in the weight of evidence, oncogenicity section.

CHAIRPERSON FROINES: In my lifetime we may see an EPA diesel risk assessment, but I'm not sure.

(Laughter.)

DPR STAFF TOXICOLOGIST LEWIS: Okay. The next section in the risk assessment section is the exposure assessment, which is divided into four sections, a dietary, drinking water, occupational, and ambient and application site air exposure. And I'm going to talk about the last section.

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DPR STAFF TOXICOLOGIST LEWIS: And since Gura and Sheryl have spent a fair amount of time talking about the air monitoring use for the exposure estimates, I'm not going to go into those in any detail.

This table simply summarizes the estimated exposure at the application site and the Jefferson School site. And these exposure doses represent the combined

methidathion and methidaoxon exposure.

And also I want to point out that due to an oversight, the one-hour exposures was not included in the last drafts of the risk characterization document. This was an accident. It was added to the exposure assessment document based on public comment and will be in the next draft of the risk characterization document.

But as you can see from this slide, the estimated exposure dosages at the application site are an order of magnitude higher than they are at the Jefferson School site, which had the highest ambient air levels.

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DPR STAFF TOXICOLOGIST LEWIS: And the last section in the risk characterization assessment -- risk assessment section is the risk characterization section. And it's divided into four sections like the exposure assessment. And again I'll only be talking about the ambient and application site air exposure.

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DPR STAFF TOXICOLOGIST LEWIS: The risk for noncarcinogenic health effects is expressed as a margin of exposure, or MOE, which is the NOEL from the animal study divided by the estimated exposure level in humans. Generally an MOE greater than 100 is considered protective of human health based on the following assumptions: That

humans are ten times more sensitive than animals; and that there's a ten-fold variation in the sensitivity in the human population.

According to the Toxic Air Contaminant Act legislation, the criterion for listing a pesticide as a TAC is that the MOE is less than a thousand. And I understand that you like to see these things in terms of percentage of RfC. And this is equivalent to 10 percent of the RfC. In other words, the air levels have to exceed 10 percent of the RfC to be listed.

In my document I have expressed the criterion relation to the MOE. But it is essentially the same thing. And I can add the RfC into my document if you would like to see that.

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DPR STAFF TOXICOLOGIST LEWIS: Okay. These are the estimated margins of exposure for the application site and the Jefferson School site for ambient air. And as you can see, the MOEs are all greater than a thousand for the ambient air, but less than a thousand for the application site, resulting in the consideration of methidathion as a toxic air contaminant based on its neurotoxic potential.

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CHAIRPERSON FROINES: Could you stay with that just for a second.

I'm looking at this table.

DPR STAFF TOXICOLOGIST LEWIS: In the report there is no one-hour value. That's new.

CHAIRPERSON FROINES: No, I'm -- I was actually looking at the table in the OEHHA document, and the numbers are different.

DPR STAFF TOXICOLOGIST LEWIS: Oh, that's because they calculated them with their ten-fold --

CHAIRPERSON FROINES: No, no. This is --

DPR STAFF TOXICOLOGIST LEWIS: Oh, really?

CHAIRPERSON FROINES: No, it's okay. There's obviously a difference in -- no, they are listing your 130 as correct, but then they list the adult as 260.

DPR STAFF TOXICOLOGIST LEWIS: Oh, I think I corrected these because Sheryl found some error in her exposure estimates. So the adult numbers changed slightly. Yeah, I forgot about that.

CHAIRPERSON FROINES: Okay. So this is the correct number then?

DPR STAFF TOXICOLOGIST LEWIS: Yeah, this is correct.

Okay. Next slide.

Or is that all you had to say?

CHAIRPERSON FROINES: Yes.

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DPR STAFF TOXICOLOGIST LEWIS: Okay. The risk for cancer is calculated by multiplying the cancer potency factor by the human exposure dosage. In general, a risk of less than 1 in a million is considered negligible. According to the Toxic Air Contaminant Act, the criterion for listing a pesticide as a TAC based on its cancer is that the risk is greater than one in a million -- or one in 10 million or 10 to the minus 7.

CHAIRPERSON FROINES: Could I ask you a question about that?

DPR STAFF TOXICOLOGIST LEWIS: Yes.

CHAIRPERSON FROINES: I'm sorry for interrupting.

DPR STAFF TOXICOLOGIST LEWIS: Uh-huh.

CHAIRPERSON FROINES: Because you told me to --

DPR STAFF TOXICOLOGIST LEWIS: Yes. Well, actually --

CHAIRPERSON FROINES: I do that very cautiously.

This listing criteria for TAC is a risk of 10 to the minus 7. Is that a legislated value? It's worded that --

DPR STAFF TOXICOLOGIST LEWIS: No, it's just --

CHAIRPERSON FROINES: -- because I've never seen it.

DPR STAFF TOXICOLOGIST LEWIS: -- I think the legislation -- and, Tobi, correct me --

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: It's a regulation. It's not part of the Act. It's part of the regulation.

CHAIRPERSON FROINES: Is that a regulation that you -- that DPR established?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Correct.

CHAIRPERSON FROINES: So 10 to the minus 7 is your decision of an acceptable level of risk basically?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: No. That's our criteria for listing as a TAC.

DPR STAFF TOXICOLOGIST LEWIS: The acceptable -- well I shouldn't say that. This -- because management decision.

CHAIRPERSON FROINES: Yeah. So how does an acceptable level of risk differ from a TAC designation?

DPR STAFF TOXICOLOGIST LEWIS: It's ten-fold lower.

CHAIRPERSON FROINES: No, I understand the numbers. I don't understand. I'm just asking about the rationale. Is it just a ten-fold safety factor for conservatism? Is that what I --

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes.

CHAIRPERSON FROINES: Yeah, okay. Because it's

awfully -- it's an awfully conservative number obviously.

DPR STAFF TOXICOLOGIST LEWIS: (Nods head.)

So the risk estimates for cancer at the Jefferson site range from 5.8 times 10 to the minus 6 to 9.0 times 10 to the minus 6, thus being sufficiently high to trigger the listing of methidathion as a toxic air contaminant.

--o0o--

CHAIRPERSON FROINES: I have one other question about this. And I know I'm just setting Joe up for the next time we meet. But the -- I shouldn't have gone into a joke about Joe. I'm sorry.

PANEL MEMBER LANDOLPH: I'm not going to wait anyway.

CHAIRPERSON FROINES: I'm sorry. It'll come back to me.

DPR STAFF TOXICOLOGIST LEWIS: So I should go on?

CHAIRPERSON FROINES: Go ahead.

DPR STAFF TOXICOLOGIST LEWIS: Okay. The next section in the risk characterization document is the risk appraisal, which discusses uncertainties related to the hazard identification, exposure assessment, risk characterization. It also compares DPR's risk assessment with U.S. EPA's and discusses various issues related to the Food Quality Protection Act.

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DPR STAFF TOXICOLOGIST LEWIS: And I was just going to highlight some of the major issues discussed in this section. We already discussed the BMD analysis for the cute NOEL. That is one of the major areas of uncertainty, is how the NOEL was estimated.

The other major issue is whether there is this threshold for the carcinogenicity due to the very high incidence of the hepatotoxicity. There was a study -- a couple studies in the literature suggesting there's lipid peroxidation in the liver with acute and subchronic exposure. And that could be a possible mechanism, but we didn't feel the evidence was sufficient to assume a threshold.

CHAIRPERSON FROINES: Yeah. Well -- but not necessarily. I mean you may have -- that's why I asked the question about what are the electrophilic compounds that might bind micromolecules. Because if you have something that you can predict will bind DNA, you have that; or if you have ROS generation, you'll certainly get lipid peroxidation. And there is that T bars data in your document, which is I think probably what you're using.

But I don't think lipid peroxidation of itself is evidence for -- threshold mechanism.

DPR STAFF TOXICOLOGIST LEWIS: Yeah. I think another possibility, it could just be increased cell

proliferation, you know, due to just getting more rapid turnover of cells and getting problems with DNA.

CHAIRPERSON FROINES: Well, lipid peroxidation means you're going to have some free radicals around. And so the question is: Where do they come from?

--o0o--

DPR STAFF TOXICOLOGIST LEWIS: The next -- the other major area of uncertainty in the hazard identification is in the potential for pre- and postnatal sensitivity to methidathion. The NOELs in fetuses and pups were all greater than in adults in the available developmental and reproductive toxicity studies. However, cholinesterase activity was not measured in any of these studies. Nor is there a developmental neurotoxicity study available for methidathion.

There was one direct dosing study in the literature which found evidence of increased sensitivity in weanling rats based on a reduced LD50 value in weanling rats compared to adults.

It should be noted that U.S. EPA recommended that the FQPA factor for infants in children be reduced from 10X to 1X based on the available developmental and reproductive toxicity studies. And they did not think that there was a need for a developmental neurotoxicity study.

--o0o--

DPR STAFF TOXICOLOGIST LEWIS: Okay. This is a comparison of the NOELs that DPR used in our risk assessment and those that U.S. EPA used. And the subchronic and chronic NOELs are identical. Although I -- you U.S. EPA did not examine ambient air exposure. They only examined inhalation exposure in workers. And they did not think there was a long-term inhalation exposure in workers, so they did not select a NOEL for that purpose. They did do a chronic dietary exposure and used the dog study for that. So that's why I had that NOEL up there. But that was the only chronic exposure they have evaluated.

And as I mentioned earlier, they did not calculate a cancer potency factor for methidathion.

For the acute NOEL, they chose to use the NOEL from the subchronic neurotoxicity study from the two-week exposure to evaluate acute exposure to methidathion rather than estimate a NOEL from the acute neurotoxicity study.

PANEL MEMBER LANDOLPH: Could I ask a quick question?

DPR STAFF TOXICOLOGIST LEWIS: Yes.

PANEL MEMBER LANDOLPH: Did you calculate from the error data in the cancer potency slope factor there what the concentration of methidathion would be that would

give you a risk of 1 in 10 to the minus 6?

DPR STAFF TOXICOLOGIST LEWIS: Okay. Say that again.

PANEL MEMBER LANDOLPH: So it's just using the cancer slope factor --

DPR STAFF TOXICOLOGIST LEWIS: Uh-huh.

PANEL MEMBER LANDOLPH: -- and guessing at a risk -- setting a risk at 1 in 10 to the minus 6.

DPR STAFF TOXICOLOGIST LEWIS: Uh-huh.

PANEL MEMBER LANDOLPH: Did you calculate a concentration --

DPR STAFF TOXICOLOGIST LEWIS: Of air concentration?

PANEL MEMBER LANDOLPH: Yes.

DPR STAFF TOXICOLOGIST LEWIS: Actually I did -- well, I'll get to my reference concentration. I calculated a reference concentration based on the carcinogenicity.

PANEL MEMBER LANDOLPH: Right. Yeah, that's what I'm getting.

How would that stack up compared to your NOELs there?

DPR STAFF TOXICOLOGIST LEWIS: Well, it's very low. It's in parts per trillion. And my NOELs are milligram per kilogram, so it's kind of hard to do a

direct comparison. But it is the lowest air concentration calculation. If you compare the acute RfC to the chronic RfC, it's, you know, orders -- you know.

PANEL MEMBER LANDOLPH: And so had you given any thought to regulating this compound based on the cancer potency rather than on the acute and chronic toxicity study data?

DPR STAFF TOXICOLOGIST LEWIS: Well, I'm sure it will be taken into consideration when they decide what sort of mitigation they need to do for methidathion.

PANEL MEMBER LANDOLPH: Because they'll obviously differ by orders of magnitude?

DPR STAFF TOXICOLOGIST LEWIS: Yeah, yeah.

But issues -- I think I should probably let Randy or Tobi address this, since I don't do the mitigation. But usually the acute toxicity is the most immediate problem that we address. And then the longer-term exposure toxicity gets addressed later on.

PANEL MEMBER LANDOLPH: The only reason -- obvious reason I raised that is because it would seem that to be health protective, you would want to go with the cancer potency data.

DPR STAFF TOXICOLOGIST LEWIS: You would or --

PANEL MEMBER LANDOLPH: I would think you would.

DPR STAFF TOXICOLOGIST LEWIS: Yeah.

PANEL MEMBER LANDOLPH: I mean I would.

DPR STAFF TOXICOLOGIST LEWIS: Yeah.

CHAIRPERSON FROINES: That's what they would take up in their risk management phase in terms of how to approach it.

PANEL MEMBER BLANC: Can I ask methodologic question about the process -- the algebra of the division between the NOEL over the -- I'm sorry -- the --

DPR STAFF TOXICOLOGIST LEWIS: -- the MOE?

PANEL MEMBER BLANC: -- the MOE calculation.

DPR STAFF TOXICOLOGIST LEWIS: Yes.

PANEL MEMBER BLANC: When you use the NOEL, however you arrive at that in the MOE, the NOEL is based on animal studies where they're given a known amount to adjust, and then --

CHAIRPERSON FROINES: Where what, Paul? I'm sorry.

PANEL MEMBER BLANC: The animals are given a known amount of the toxin to ingest or it's by gavage, or whatever, their exposure's defined. The whole purpose of the ratio calculation is you're saying, "Okay, this is what it takes in animals," taking into account this sort of safety calculation of the low effect -- the "no elect" level. And its a ratio then to the airborne exposure values that you've calculated.

But children, for example, who are getting this airborne exposure are already dosed with a fair amount of pesticide residue -- and children more than adults because it's all in fruit like apricots and oranges and apples.

So shouldn't there really be an adjustment to the ratio calculation taking into account that this airborne exposure that you're developing a safety factor is superimposed on a dietary hit that they've already received?

DPR STAFF TOXICOLOGIST LEWIS: Actually in the document I didn't plan on showing -- well, I do have some backup slides. But I didn't show the aggregate exposure, but it is calculated in the document where you add the dietary exposure for children and for adults.

PANEL MEMBER BLANC: But it doesn't come into your policy decision of: Has this reached the threshold to be a toxic air contaminant?

DPR STAFF TOXICOLOGIST LEWIS: Well, it already reached it before it --

PANEL MEMBER BLANC: Well, only for some of the calculations, not for all of them, right?

DPR STAFF TOXICOLOGIST LEWIS: Well, my understanding -- and this is getting out of my area -- is once it gets tripped, it's tripped -- I mean it's, you know --

PANEL MEMBER BLANC: No, but don't you do this whole thing in your findings about how, well, yes, it meets the threshold for toxic air contaminant but it doesn't reach a threshold for any remediation?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Yes, you're correct.

PANEL MEMBER BLANC: So in fact it's not all or nothing?

DPR SENIOR ENVIRONMENTAL RESEARCH SCIENTIST SEGAWA: Well, the risk management phase will address not only the air exposure as well as dietary occupation exposure. So we will look to see if all or any of the exposure scenarios need mitigation.

PANEL MEMBER BLANC: Yeah, but I'm talking about your findings. Is there -- not your findings -- your executive summary as currently written.

DPR STAFF TOXICOLOGIST LEWIS: Oh, at the time I think I indicated that the mitigation did not appear to be needed for the application site. But since we added the one-hour exposure, those have dropped under a hundred now. So that would suggest mitigation may be needed for that.

PANEL MEMBER BLANC: Well, maybe -- okay. So maybe in this case it worked out in the end so it didn't matter. But in fact it is true that you could have a scenario where you had reached the threshold for one thing

but not another, but if you had taken into account what the -- I mean this is what you had to go through with fluoride, wasn't it, that you looked at to an extent that this -- that the -- so I'm curious just from a policy and threshold point of view in terms of the logic of the whole methodology of the --

PANEL MEMBER BYUS: Well, in addition to that it's the whole cumulative issue of organophosphate, exposure from all organophosphates, I mean how you make them additive synergistic, how you do those kinds of calculations. So some mechanisms are, although albeit not exact, they are very, very similar. I mean it gets to that question.

PANEL MEMBER BLANC: And I think that one thing that would be nice to see in your revision if it's not there already is some acknowledgement of that. If -- as a caveat, you know, okay, you know, we've done this calculation, but it should be borne in mind that this calculation doesn't actually take into account the -- this raw ratio doesn't take into account the fact that the LOEL is based on one root of exposure or whatever, you know. But the presumption, there seems to be a logical shortcoming to the whole idea.

DPR STAFF TOXICOLOGIST LEWIS: In the discussion or issues related to Food Quality Protection Act we talk

about the cumulative toxicity issue with OPs. And mainly that focuses on what U.S. EPA has done related to that. But we have not proposed any, you know, changes in that whole area. It's a difficult issue, you know.

PANEL MEMBER BLANC: Well, it should just be knowledge in your executive summary.

DPR STAFF TOXICOLOGIST LEWIS: Yeah, that it is -- that it's an underestimation, you know. And also with possible underestimation due to the methidaoxon.

PANEL MEMBER BYUS: There's also the subset of individuals with increased sensitive to organophosphates. So they lack that enzyme, clears it --

DPR STAFF TOXICOLOGIST LEWIS: Oh, yeah, yeah.

PANEL MEMBER BLANC: And isn't it consistent with -- and our Chair should comment on this. But our previous approach to the SB 25 evaluations, did we take into account certain exposures for which the children might not be more sensitive in milligram per kilogram, but their exposure would be greater for whatever reason?

CHAIRPERSON FROINES: Yes.

PANEL MEMBER BLANC: And in fact if this is a pesticide residue which accumulates on fruit, and if children have a high fruit diet, then their cumulative exposure is going to be that much greater.

DPR STAFF TOXICOLOGIST LEWIS: Well, hopefully

we've addressed some of that greater exposure in children in our exposure assessment, because we have exposure estimates for infants as well as adults. Also, the dietary exposure has dietary estimates for children based on consumption data for children's. So hopefully we've addressed some of that.

PANEL MEMBER BLANC: And you combined the two.

DPR STAFF TOXICOLOGIST LEWIS: Yeah, and we combined the two, yeah.

PANEL MEMBER BYUS: Yeah, actually I think the occupational setting around what you'd call -- we've had this problem in Coachella Valley, children become exposed because their parents worked in the fields and they get it on their clothes. And then they're -- they're sitting -- they have it on the car seats. And the children wind up playing a lot in the cars, and they get exposure that way, through -- I don't know whether that's occupation or whatever it is. It's not something you'd put in to the NOEL, but I mean it's just --

DPR STAFF TOXICOLOGIST LEWIS: Yeah, it's hard to, yeah, estimate --

PANEL MEMBER BLANC: Are there different reentry times for artichoke treatment than for --

DPR STAFF TOXICOLOGIST LEWIS: Sheryl, do you recall if the reentry intervals are different for

artichokes than the tree crops?

PANEL MEMBER BLANC: Because I have to say that having harvested artichokes myself, the dermal exposure factor is quite high.

DPR STAFF TOXICOLOGIST BEAUVAIS: Artichoke harvesting isn't in here because of the restriction on when the methidathion is applied. You apply it prior to budding.

PANEL MEMBER BLANC: Oh, okay.

CHAIRPERSON FROINES: You apply it -- I'm sorry.

PANEL MEMBER BLANC: Prior to budding.

DPR STAFF TOXICOLOGIST BEAUVAIS: Budding. So that's why it's not an issue specifically for artichokes because of restrictions specifically for methidathion.

PANEL MEMBER BLANC: Thanks.

CHAIRPERSON FROINES: Are you finished?

DPR STAFF TOXICOLOGIST LEWIS: I was just going to go through the reference concentration calculations, if you're interested.

CHAIRPERSON FROINES: Sure.

DPR STAFF TOXICOLOGIST LEWIS: It would be really quick.

All the NOELs used in this risk assessment were all NOELs. So to derive a reference concentration, it was first converted to an equivalent human inhalation NOEL by

dividing by the respiratory rate in humans, and then dividing by an uncertainty factor of a hundred. This gives you the RfC in milligrams per cubic meter. That's then converted to ppm's by multiplying times molecular volume divided by molecular weight.

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DPR STAFF TOXICOLOGIST LEWIS: So the RfCs calculated with this approach are 5.1 micrograms per cubic meter for acute, 3.4 micrograms per cubic meter for seasonal, and 2.5 micrograms per cubic meter for chronic. Oh, and then the ppb's -- equivalent ppb's are underneath.

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DPR STAFF TOXICOLOGIST LEWIS: On the next slide I have my calculation of the cancer RfC. If you take the negligible risk level of 10 to the minus 6 and divide it by the cancer potency factor, you get an RfD for cancer. You can convert that then to a concentration by dividing by the inhalation rate in humans. Using this approach you get a cancer RfC for methidathion of 6.8 nanograms per cubic meter, or .5 parts per trillion.

--o0o--

DPR STAFF TOXICOLOGIST LEWIS: So in conclusion, the MOEs for ambient air are all greater than a thousand for acute seasonal and chronic exposure. For the application site, however, the MOEs were all less than a

thousand, triggering the criterion for listing methidathion as a toxic air contaminant based on its neurotoxic potential.

The cancer risks for methidathion were also greater than the negligible risk level, and again triggering the criterion for listing methidathion as a toxic air contaminant.

And that's it.

CHAIRPERSON FROINES: Good. You did it.

DPR STAFF TOXICOLOGIST LEWIS: All right. Is it 3 o'clock yet?

(Laughter.)

CHAIRPERSON FROINES: So how should we proceed?

PANEL MEMBER BLANC: I think that in order at least to give them some guidance, we need to comment in some form on the DPH response to the executive summary or the alternate DPH executive summary, bearing in mind that there was some changes that you had mentioned that made the two out of synch.

But otherwise how are they supposed to respond if they don't get a sense --

CHAIRPERSON FROINES: I missed the first part -- the who was executive summary --

PANEL MEMBER BLANC: There was this memo from OEHHA that diverged very substantively from the executive

summary of --

CHAIRPERSON FROINES: Yes.

PANEL MEMBER BLANC: -- the pesticide people for the same documents -- or the same material, right?

CHAIRPERSON FROINES: Yes.

PANEL MEMBER BLANC: And unless we as a committee give some feedback to the DPR about that, I don't know how they're supposed to respond to it.

CHAIRPERSON FROINES: Well, it's a question of what we want to take up now. Because she's going back and looking at bench -- doing a benchmark calculation. And she's made some adjustments where in fact that the acute MOE for DPR is now below 100. So at least with respect to the acute, we're still talking about the 10 versus 3 issue, Paul.

Is that -- that's what you're referring to?

PANEL MEMBER BLANC: Well, that's the most substantive divergence. But I think that it would be helpful to look carefully at where the two executive summaries tend to differ from each other, and for you to meet with them and sort of come to terms with what of that is just style or what is substance, and are there parts where you have a substantive difference of view or can they be adjudicated? Because I think that I certainly would be more comfortable with a closer congruence of

those two documents.

CHAIRPERSON FROINES: I think my view is that the two documents are essentially the same with one major difference; and, that is, the LOEL to NOEL conversion. But aside from that, I think the documents are almost identical.

DPR ASSISTANT DIRECTOR JONES: Yeah. And -- Paul, this is Tobi Jones.

When you talk about the two executive summaries, I think there are two things: There's an executive summary the staff prepared from a document we've presented to you today regarding ambient and off-site exposure. The findings that OEHHA prepared are what they're required to prepare based on their review analysis of that.

And I think John is correct; it seems to me there's that one substantive difference about the use of 3 versus 10.

And I think -- you know, you've provided some tasks to Carolyn about some further calculations on BMD.

But I just want to clarify. There are not two executive summaries. There's --

PANEL MEMBER BLANC: No, no, no. No, I was imprecise.

CHAIRPERSON FROINES: No. What I was understanding is that there is this big fat document,

which is the one I'm talking about; and then there's the small OEHHA document. And so I'm taking those. And I didn't -- wasn't thinking about your executive summary, unless Paul was.

But we've raised the issue of the benchmark dose. We've raised the question of if something isn't statistically significant, do we therefore ignore it. And that's an issue. We talked about the conservatism or lack thereof of the exposure estimates. We've talked about the gavage method of administration. So we have exposure, method of administration, difference of opinion about -- well, our view about statistical significance and how one wants to look at that. There's the OEHHA document. And I can't think of the other things that came up. There were others. Obviously the food, fruit issue is another question.

And as far as I'm concerned, if there was a way for OEHHA and DPR to resolve that difference, that would -- that doesn't put us in the position of our having to be the adjudicator within that process. I think we all would be comfortable. And so that's one thing I -- as part of the benchmark discussion maybe you can talk with DPR -- OEHHA and see if that can be worked out.

I think those are the --

PANEL MEMBER BLANC: Yeah, you alluded to the

other one, which is -- but I want to reemphasize, which is -- because it could have a very big effect on your statistical algebraic calculations, which is two issues of exposure, the exposure calculation and the school, wherein you had used a mathematical model to come up with a 95th percentile on a logarithmic distribution, which I think is the incorrect approach. And I think that you may come up with a considerably higher level if you look at the cluster of high values, which may actually reflect an exposure day.

And, secondly, I -- I know Roger is very skeptical. But I would like you to go back and look at the wind direction values that you have as hard as you can look and see if in fact, aside from the four times multiplication, which I agree with because apparently they used one-fourth as much as maximum treatment on that test plot, whether there is any way of vectoring out what a higher estimate of values would be if there was monitoring in the direction that the wind actually went in.

CHAIRPERSON FROINES: I'm getting two heads nodding back there. Is that reasonable?

Well, obviously we're not going to go around the room and have Charlie and Roger give points of view today, because it's -- we're close to quitting time.

But do other members of panel have

recommendations that they want to make for additional work between now and the next meeting? At the next meeting clearly we're going to go around. Joe has written a lot of comments. Charlie worked with -- as the lead and so will have comments. Craig I think is feeling good. And sulfuryl fluoride's gone, so he's silent.

PANEL MEMBER BYUS: Very quiet.

CHAIRPERSON FROINES: And Roger may have comments on the --

PANEL MEMBER ATKINSON: I do have, yeah.

CHAIRPERSON FROINES: But he'll tell us about -- he needs to tell us about those comments.

PANEL MEMBER ATKINSON: I may have another series on the environmental, which I took forward to somewhere --

CHAIRPERSON FROINES: So there'll be comments from the Panel at the next meeting. And so my only question for today as we sort of move to closure is: Do you have other suggestions that you can give right now for them to consider in the interim?

Joe.

PANEL MEMBER LANDOLPH: And, you know, I wrote mine down for you to make it easy for you.

I would also suggest that in the discussion, the use of the term "oncogenicity," I would prefer "carcinogenicity," because I always think of carcinogenic

chemicals versus oncogenic viruses. And we usually use "carcinogenicity."

And I think if you make a nice summary table of that slide you just showed with the very beautiful calculations and put that up front -- in the document and up front, maybe in the executive summary, that would help, so we could see actually where the carcinogenicity levels were for the risk of one in a million compared to the NOELs and LOELs. That would be really easy to grasp that immediately.

DPR STAFF TOXICOLOGIST LEWIS: So you're talking about the reference concentration?

PANEL MEMBER LANDOLPH: Yeah, that would be great.

CHAIRPERSON FROINES: I also mentioned the ability of metabolize to binding with macromolecules. And I'll work on that too in the interim. So I'll come in with some ideas for you. Because I'm interested in what kind of protein binding there might be.

Charlie, do you have a comment at this point?

PANEL MEMBER PLOPPER: Yeah. Would it be possible for the health defects and the exposure people to get together and come up with some kind of a realistic assessment? Because most of these toxicity studies are gavage, which means that's a bolus type of dose. But we

don't really have a bolus's exposure assessment. And it's very difficult to figure out what's going on here if you don't have both, particularly when the sites that -- there's these major differences in local concentration at the time of an application. We don't really know what that is. And it's going to -- somehow there has to be some resolution there. Because what you're saying is that likely most of the occupational exposure's inhalation. But the toxicity danger's gavage. But they're both bolus exposures. And somehow that seems to be the biggest problem here of deciding whether this is an overestimate or an underestimate of risk.

CHAIRPERSON FROINES: Joe.

PANEL MEMBER LANDOLPH: And I noticed reading through your cancer risk assessment calculations, some of them ranged as high as 10 to the minus 2 for the workers.

DPR STAFF TOXICOLOGIST LEWIS: Oh, yes.

PANEL MEMBER LANDOLPH: You know, so what are you going to do about that? You obviously communicate this to your risk managers or whatever when you finish.

DPR STAFF TOXICOLOGIST LEWIS: Um-hmm.

CHAIRPERSON FROINES: Craig or Roger.

PANEL MEMBER BYUS: Yeah, I agree with you, Charles. I think also may be important with the carcinogenicity mechanism if it's more sort of tumor

promotional in aspect. Theoretically to get those effects you need the presence of the stimulus regularly. If you have more episodic exposure, it's no longer promotional.

DPR STAFF TOXICOLOGIST LEWIS: I should point out though, the subchronic and chronic studies are dietary. So it's not so much a bolus than -- yeah, it's the acute ones -- or in the developmental toxicity ones that are gavage. But, yeah, I just wanted to point that out.

PANEL MEMBER BYUS: But you hit on all the things that I --

CHAIRPERSON FROINES: I have a policy question for you. Andy, maybe you can help on this.

It's my understanding that in California for a chemical to be identified as a carcinogen, one needs one species with two studies, two species, human evidence -- in other words, there are a set of criteria which is a matter of policy the state has historically used.

In this study -- in this particular determination we essentially have one study in one species. And my question is: Does that meet the policy criteria for defining substances of carcinogen?

Obviously we're not -- we're going to continue to pay attention to this issue. But there is a cancer policy I think --

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT

CHIEF SALMON: Yes. Well, it applies in specific -- sorry. Andy Salmon, OEHHA.

The policy -- the specific laying out of that policy tends, you know, to appear in slightly different processes than this particular one. I think the TAC process, you know, what defines it as a carcinogen is your judgment as the expert panel rather than a specific narrow guideline.

The usual criteria would be two independent studies. Those independent studies might be just two separate studies in -- you know, at different times and laboratories. Now, you -- I think that you have those. You have --

DPR STAFF TOXICOLOGIST LEWIS: Yeah, we do. Two studies --

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Yeah, there are two independent studies.

CHAIRPERSON FROINES: There are two studies, but one study they don't discuss, and they basically say it doesn't meet criteria for -- study.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: But I don't think that our decision criteria in other programs for carcinogenicity make any reference to whether it meets FIFRA guidelines or not. It's a question of whether it produces a positive result

which is considered reputable.

And so in this case I think you have -- you certainly have the two independent study criteria. I think --

CHAIRPERSON FROINES: Well, then we should see the data from that other study.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Well, I think it would be use -- I mean we I think in OEHHA have a tendency to certainly take note of the compliance of a study with good laboratory practice as a -- you know, if you like an endorsement of its value. But we certainly don't dismiss or ignore studies.

CHAIRPERSON FROINES: So as I understand what you're saying is -- of course this panel doesn't have a cancer policy, so we can do pretty much what we choose, and do.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Yes.

CHAIRPERSON FROINES: But the point is I'm asking is -- so there are no criteria that DPR or OEHHA or ARB has to use in terms of deciding whether to bring something to the Panel?

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: No.

CHAIRPERSON FROINES: In other words they can

decide to bring the carcinogenicity issue to the Panel even if there's only one study?

If OEHHA or DPR considered that, you know, they would value your opinion on the topic, then they --

CHAIRPERSON FROINES: Okay. I just want to --

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: -- they're entitled to ask for it.

CHAIRPERSON FROINES: I'm just wanting to be clear on what the guidelines are so we're all on the same page.

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT CHIEF SALMON: Well, I don't think they're rigid guidelines. But as a general principle, we look at things and see if there are two independent studies, which are -- you know, sometimes it's a rat study and a mouse study. Sometimes it's, you know, I mean we have brought forward things where we've had two species but -- sorry -- one species but two sexes. So --

CHAIRPERSON FROINES: Well, then I think it would be useful to have a page or something in the document that gives some of the results of that study, rather than the study just being ignored and said, you know, "They don't meet the guidelines and so, therefore, we're not going to provide you any information from them."

OEHHA AIR TOXICOLOGY AND RISK ASSESSMENT UNIT

CHIEF SALMON: From our perspective, it's important supporting evidence in terms of building a case for consideration.

CHAIRPERSON FROINES: Then I think we should have something to look at about it, even within its limitations.

Thanks.

Thanks, Andy.

Tobi, I assume that you agree with what he says, because I didn't see your head grimacing.

So it's 3 o'clock. Do I have a motion to close?

Do you have --

PANEL MEMBER BLANC: Yeah, before I put that motion on the -- could you, Mr. Chair, just acknowledge what it is that we put off that was -- did appear on the agenda. I don't believe we completely the agenda, as we --

CHAIRPERSON FROINES: The agenda piece that wasn't taken up was basically a discussion with Tobi about DPR's future plans in terms of their approach to pesticides.

Is that a reasonable way of saying it?

DPR ASSISTANT DIRECTOR JONES: It's air quality initiative.

PANEL MEMBER BLANC: So that will be deferred to

the next meeting?

CHAIRPERSON FROINES: That will be deferred to the next meeting.

And that is for information purposes really only. We don't -- I don't think we have -- there's nothing -- that was just something I requested because I saw an article in the newspaper. And so it was just to keep everybody informed.

PANEL MEMBER BLANC: Okay. Then I move to adjourn.

CHAIRPERSON FROINES: Second.

PANEL MEMBER BYUS: Second.

CHAIRPERSON FROINES: I think the presentations were really quite good today. And so thank you very much.

And we did it by 3. So meeting's adjourned.

(Thereupon the California Air Resources Board, Scientific Review Panel adjourned at 3:00 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, and Registered Professional Reporter, do hereby certify:

That I am a disinterested person herein; that the foregoing California Air Resources Board, Scientific Review Panel meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 12th day of July, 2006.

JAMES F. PETERS, CSR, RPR
Certified Shorthand Reporter
License No. 10063