MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

SCIENTIFIC REVIEW PANEL

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

SIERRA HEARING ROOM

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TIFFANY C. KRAFT, CSR
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APPEARANCES

PANEL MEMBERS

Stanton A. Glantz, Ph.D., Acting Chairperson

John R. Froines, Ph.D., (via teleconference)

Alan R. Buckpitt, Ph.D.

Sarjeet Gill, Ph.D.

William W. Nazaroff, Ph.D.

REPRESENTING THE AIR RESOURCES BOARD:

Mr. Jim Behrmann, Liaison, Scientific Review Panel

Mr. Peter Mathews, SRP Support Administration

REPRESENTING THE OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT:

Dr. George Alexeeff, Director

Dr. Robert Blaisdell, Supervisor, Environmental Modeling Section

Dr. Daryn Dodge, Staff Toxicologist

Dr. Melanie Marty, Chief, Air Toxicology and Epidemiology Branch

ALSO PRESENT

Mr. Brian R. Leahy, Director, Department of Pesticide Regulation

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PROCEEDINGS

ACTING CHAIRPERSON GLANTZ: We're going to start. So I'm Stan Glantz. I'm the Acting Chair of the Scientific Review Panel on Toxic Air Contaminants and would like to call this meeting to order.

John Froines is the usual Chair. The real Chair is on the phone where he is skateboarding in Steamboat Springs, Colorado. So welcome. We have kind of a light attendance today because of illness and travels, but we do have a quorum.

And the primary item of business today is a review of the Air Toxic Hot Spots Program Technical Support Document on exposure assessment and stochastic analysis. But before that, we have a visitor today. I'd like to introduce Brian Leahy, who is the new head of the Department of Pesticide Regulation.

Did you want to say anything?

DEPARTMENT OF PESTICIDE REGULATIONS DIRECTOR LEAHY: Should I speak into any one?

Thank you for having me. It's a pleasure to be here. I can tell you air quality to me means growing up in the L.A. basin, swimming six miles a day, and getting sent home because we couldn't see the end of the pool courtyard; walking up the side of a mountain and not seeing the mountain. So I think that's what I think of

when I think of this Committee. So I'm glad that we're making progress, and it's a real pleasure to be here.

ACTING CHAIRPERSON GLANTZ: Well, thank you for coming. I hope we entertain you adequately.

DEPARTMENT OF PESTICIDE REGULATIONS DIRECTOR LEAHY: I hope so, too.

ACTING CHAIRPERSON GLANTZ: So I think I'll begin -- the other bit of news I heard is George Alexeeff is now the Director of the Office of Environmental Health Hazards. After being Acting Director for some protracted period of time, do you want to say anything, George? Congratulations, I think.

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT DIRECTOR ALEXEEFF: I'm George Alexeeff. I was appointed Director a couple weeks ago. I was Acting Director for a little over a year.

So I want to make a couple comments. One is because when I was first hired by the State, my task was to develop a document for review by this Committee. And it was on carbon tetrachloride. After that, I developed perchlorethylene, methylene chloride. And my life was very closely tied to this Panel when I first started. And then I moved up through the ranks into this position. So I've always been very fond of this Committee and the work of this Committee and the importance of this Committee.

And I just wanted to make one brief comment is that, you know, in looking at the kind of information we provide to you today is a little bit different kind of a document than we normally have. We're usually looking at some sort of human health or some sort of health information and trying to figure out whether we can develop a reference level or a cancer slope factor or something like that.

But when we're looking at the data, we're seeing that we're kind of -- we're starting to run out of the type of data that we normally look at and provide to the Committee in terms of animal testing data or human data. So we're going to have to figure out a way of working with the Committee and looking at invetro data coming in and looking at incorporating that in a way that would be health protective and such.

So I'm looking forward to working on the Committee with that and seeing what we can do. That's something U.S. EPA is also trying to figure out as well. It's a known fact that we have in some ways too many chemicals and not enough data or enough animals or enough data, whatever we want to call it, so we have to look at new ways of trying to figure out how to identify chemicals of concern so they can be addressed. So thank you very much.

PANEL MEMBER FROINES: George, can you hear me?

ACTING CHAIRPERSON GLANTZ: Yes, John. Hello.

PANEL MEMBER FROINES: Hi. Congratulations.

I just wanted to say I would like to propose, based on what you just said, that we have a meeting -- one of the topics at a meeting at some point in the future is the whole idea of new toxicity testing and predictive toxicology. Because I think those kinds of end points, cellular end points -- invetro end points are going to become more and more important over time with ToxCast and Tox21. And I think the Panel would benefit from being familiar with the EPA and NIEHS activities in those areas. And we don't need to take a long time. But I think a short presentation and discussion would be useful.

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT DIRECTOR ALEXEEFF: That sounds great. Thank you.

ACTING CHAIRPERSON GLANTZ: Any of the members want to say anything?

Okay. Well, I've been on this Committee the second longest time behind John Froines. And I remember you coming in. We were all, like, younger. I think Melanie was pregnant. How old is your kid now?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: The youngest is almost 23.

ACTING CHAIRPERSON GLANTZ: So, yeah. I don't

know if it's good or depressing. Well, anyway, so why don't we just -- I guess I would just say one introductory comment about this report. And this is an update of an earlier report that was from 2000 -- right -- 2000, which I was the lead person on and volunteered to be the lead person on this one. I didn't realize it would be like three times this thick.

But the basic idea of this report or the procedures developed in the first report, which I think were quite innovative for the time, were rather than just taking point estimates sort of average values or 95 percentile values or exposure for various biological process parameters and just multiplying all of those together to actually try to take into account the distributional characteristics of the exposures and of the various biological variables. And I think that may well have been the first time anybody tried to do that.

And what this report represents -- I'm also the lead on this one -- is a further refinement of the basic approaches that were used then. And I think there are two things that have changed since the first report. One is the amount of data available upon which to base such modeling efforts, although it's still not perfect.

And also I think the computational capabilities and the software that's available to support this kind of

modeling is much, much, much better than it was in 2000.

So with that little bit of introduction, I'll turn it over to Melanie and hopefully the slides are now numbered. Was that the big controversy?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: That was the big PowerPoint 210 stumped us in terms of being able to number the slides. Pretty hard for John to follow.

ACTING CHAIRPERSON GLANTZ: Back converting to PowerPoint 2007. Was that the solution?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: You have to ask Dr. Andy Salmon Wizard how he did it.

PANEL MEMBER FROINES: Can I make one announcement that Stan wasn't aware of, I think?

We have a new member of the SRP. And her name is Beate Ritz, and she's an epidemiologist and she's at U.C.L.A. So we have a new person to join the Committee.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Okay. I'm going to start by -- well, first I should introduce myself for the court reporter.

I'm Melanie Marty, the Chief of the Air Toxicology and Epidemiology Branch at OEHHA. And today we're going to hear a presentation about the Revised Hot Spots Exposure Assessment and Stochastic Analysis Guidelines.

Dr. Bob Blaisdell, the Section Manager of our Exposure Monitoring, and Daryn Dodge, our toxicologist, are going to give the presentation.

So Bob, take it away.

(Thereupon an overhead presentation was presented as follows.)

DR. BLAISDELL: So Daryn and I are going to be switching back and forth as we go through this presentation. It's a somewhat lengthy presentation, as the document is. So if you have questions, please interrupt.

ACTING CHAIRPERSON GLANTZ: Let me just -- do you think because the document -- and I'd like to get a sense of the Committee.

Since the document is so long, do you want to have them do the whole -- how many slides is the whole presentation? Fifty-four.

Do you want to hear the whole presentation before we start talking about it? Or do you want to have them kind of go through it in pieces and then stop and discuss it or just interrupt with questions or what do people want to do? Because it is a very long document.

PANEL MEMBER NAZAROFF: I don't know how to answer your question, Stan, but let me give you input you might use to judge.

I have a total of 47 comments that vary from sort of the T crossing, I dotting that don't need to be presented here. I've just e-mailed them to Melanie like 15 minutes ago. But some of them are really substantive.

And I guess my preference -- I will answer your question -- is to hear what the OEHHA folks have to tell us and then get into the whole substance because the comments go across the whole document. It seems like it's going to be hard to organize by section.

ACTING CHAIRPERSON GLANTZ: Okay.

PANEL MEMBER BUCKPITT: That makes sense.

PANEL MEMBER GILL: I think that's better.

ACTING CHAIRPERSON GLANTZ: Okay. Go on.

DR. BLAISDELL: First of all, these are the main people who worked on --

PANEL MEMBER FROINES: Can I interrupt? I wasn't quite clear on Bill's comment. Are we to interrupt during the presentation or not?

ACTING CHAIRPERSON GLANTZ: No. We decided to just let them go through the whole presentation. I think if there's some burning point we could, but let's try to get them get through the whole thing.

PANEL MEMBER FROINES: That's okay.

DR. BLAISDELL: Okay. This is a list of the many people who were authors and reviewers and project leads on

this document.

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DR. BLAISDELL: I'd like to give some background on the Air Toxics Hot Spots Program.

The stationary sources in California report emissions of a specified list of chemicals to the Air Resources Board and the local Air Pollution Control Districts.

Facilities are prioritized by the districts into three categories: High, medium, and low concern. And this is based on emission estimates, distance to nearest receptor, information on potency of toxicants, and worst-case meteorology.

Facilities that sort of flunk the initial screening are required to conduct a health risk assessment to estimate public health impacts to the surrounding population from facility emissions. The Air Toxics Hot Spots Program is a Public Right to Know Act. So the facilities are required to hold a public meeting and notify the residents.

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DR. BLAISDELL: One of the advantages of this program is that the risk management activities by the local air districts can be prioritized based on the results of the risk assessments. The Air Resources Board

uses the results of risk assessments to determine the need for and to design air toxics control measures that apply to classes of industries and types of industrial activities, such as chrome plating.

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DR. BLAISDELL: OEHHA's role, as specified in the statute, the statute requires risk assessments to be conducted in accordance with guidelines developed by OEHHA.

OEHHA created technical support documents to lay out the underlying science and methods that were first adopted in -- these guidelines were first adopted in 1999 to 2000.

OEHHA revised technical support documents after passage of SB 25, which required more explicit consideration of infants and children, both in terms of exposure and potential sensitivities relative to adults.

The non-cancer and cancer dose response assessment guidance was approved following SRP review in 2008 and 2009.

OEHHA is also required to review all risk assessments produced by the facilities. These are sent to us by the districts, and our findings are conveyed to the district in a letter.

The exposure guidelines, which is the final part,

are undergoing your review now.

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DR. BLAISDELL: The Hot Spots Exposure Guidelines need to be practical and yet apply to many different situations throughout the state, adaptable to different scenarios and types of facilities. And they need to be useful to do comparisons of potential health impacts and risks across facilities so the methods need to be standardized. And above all, they need to be protective of public health.

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DR. BLAISDELL: Why did we undertake this revision? As I mentioned before, in part, it was to consider -- to reconsider infants and children under our SB 25 mandate. The revision of the exposure assessment guidance was prompted by the recognition of greater risk for early in life exposure.

The revisions incorporate the latest scientific data on exposure and fate and transport. A large body of literature became available since our last version in 2000. This presentation focuses on the major changes to the document.

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DR. BLAISDELL: We needed exposure variants for different age ranges than in the previous guidance.

The cancer risk for exposures from the third trimester to less than two years is weighted 10X.

Cancer risk for exposures from two to less than 16 years is weighted 3X.

Exposure is greater earlier in life because of behavioral, physiological differences, biochemical differences, and therefore risk needs to be separately calculated for each age range and then summed. Therefore, we needed exposure variants for different age ranges corresponding to these specific age groups.

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DR. BLAISDELL: Also, cancer risk needed to be calculated for different residential exposure durations of 9, 30, and 70 years, which meant that we needed still more age ranges.

This is an example of calculation of cancer risk from the third trimester to age 30. And essentially, you calculate the average daily dose for the third trimester times the cancer potency factor, times ten, which is the age sensitivity factor, times the proportion of 70 years that the third trimester represents, which is .3. And then add it to the average daily dose from age zero to 2, times the cancer potency factor, times ten, which is the age sensitivity factor times 2/70th, so on, so forth.

So, therefore, we need exposure variants from 0

to 2, 2 to 9, 9 to 16, 16 to 30. And that actually should be 16 to 70 on the last one.

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DR. BLAISDELL: These are the pathways that are evaluated under the Hot Spots Program. All chemicals are evaluated for inhalation. There are also chemicals that are subject to deposition in the Hot Spots Program. And those are evaluated by the dermal and soil injection pathways at least.

Some chemicals can be transferred to mother's milk. So we evaluate that pathway, too.

We have a provision for home grown produce, home raised meats, chicken, beef, and pork, home raised eggs, angler caught fish, if there is a pond where people fish. And we also put the facility. Drinking water from local surface waters. We don't worry about reservoirs, and so on.

These pathways, the pathways that are in an individual risk assessment, depend on the chemical and the physical chemical properties. And also at the particular site there needs to be a completed pathway. In other words, if the facility is out in the desert in California, there may not be any vegetable gardens around. So that pathway is not considered, even though we have a chemical, which is subject to deposition.

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DR. BLAISDELL: So only non-volatile and semi-volatile chemicals are evaluated in the Hot Spots Program for the non-inhalation pathways, because the chemical is originally airborne. And there is not any significant exposure to volatile organics by other pathways.

The non- and semi-volatiles include some important toxicants, however such as polycyclic aromatic hydrocarbons, dioxins, furans, mercury, lead, and hexavalent chromium. Thus, we have exposure variants for all significant pathways of exposure that can occur with airborne deposition.

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DR. BLAISDELL: Facilities, according to the legislation, have the option of presenting alternative site risk assessments. OEHHA provided guidance for this in 2000 and essentially this hasn't changed. Essentially, the facility can present anything that they want in this risk assessment, but we provided some guidance in terms of what we would be looking for if we reviewed an alternative risk assessment.

The first Tier 1 is a point estimate approach and uses the OEHHA recommended point estimates, which you see in the document.

Tier 2 would be a point estimate approach that uses justified site-specific point estimates. In other words, somebody has a pond and people are fishing in that pond. And they don't like our estimate of fish consumption and they can figure out a way to more accurately estimate fish consumption, they might incorporate that into a Tier 2 risk assessment.

A Tier 3 would be a stochastic approach using the OEHHA recommended distributions.

And a Tier 4 approach would be a stochastic approach with site-specific distributions that the facility would come up with.

We have gotten a few alternative risk assessments over the years. I don't think that we've really gotten any Tier 2 -- or actually, the only thing I think we've seen really is the Tier 1 risk assessments, which all facilities are required to do.

ACTING CHAIRPERSON GLANTZ: I just have one clarifying question. When you say justified, who makes the decision if they're justified?

DR. BLAISDELL: Well, essentially what we'd be looking for is some sort of database.

ACTING CHAIRPERSON GLANTZ: But it's OEHHA who has to accept the justification?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF

MARTY: OEHHA has to review the document and accept the justification for the alternative.

DR. BLAISDELL: If we comment, if we didn't feel that it was justified. We're just trying to let the facilities know that you just can't make something up and have it viewed favorably by our office.

ACTING CHAIRPERSON GLANTZ: Okay.

DR. BLAISDELL: Okay. Most of the OEHHA distributions and point estimates in this document have been revised relative to the 2000 document because there was a lot of newer data available.

One of the things that we managed to do is come up with a stochastic approach for the dermal pathway, whereas in the previous document there was only a point estimate approach.

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DR. BLAISDELL: There is a piece of legislation that was passed a few years back called SB 352. SB 352 required a risk assessment for proposed school sites that were to be located within 100 yards of a busy roadway. It didn't necessarily ban the school site from consideration by the local district, but it said a risk assessment had to be done. And it specified the use of the hot spots risk assessment procedures, but the 2000 document only had 24-hour breathing rates and eight-hour worker breathing

rates.

So we included some information in this revised exposure assessment stochastic analysis document such as one-hour breathing rates at various activities that could be estimated to use a breathing rate during a school day with different activities because activity levels at a school site will vary quite a bit. In other words, it can be in the classroom or out on the track. So we wanted to provide some tools for SB 352.

PANEL MEMBER FROINES: Can I answer a question?

DR. BLAISDELL: Sure.

PANEL MEMBER FROINES: Just to clarify. In schools, teachers work many times longer than eight hours. And eight hours is the traditional view, but it's not really adequate. And it seems to me that needs to be discussed further.

DR. BLAISDELL: Okay. We can certainly include something --

ACTING CHAIRPERSON GLANTZ: Why don't we come back to the specific issues after they've got through the whole report though. Why don't we make a note of that and we'll come back to that. Go on.

UNIDENTIFIED AUDIENCE SPEAKER: I have a quick point. What's the difference between point estimate and stochastic estimate briefly?

ACTING CHAIRPERSON GLANTZ: Why don't -- let's see when's the best place -- a person in the audience just asked what's the difference between a point and stochastic estimate. That's a good point worth making.

Rather than interrupting the presentation, at some logical place as you start getting into talking about the actual modeling, why don't you address that. Okay. That's a reasonable thing to talk about. But I think there is probably a place you can just sort of address that as you're going along.

DR. BLAISDELL: Okay. I'm going to go through the --

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DR. BLAISDELL: Daryn and I are going to go through the various chapters here.

ACTING CHAIRPERSON GLANTZ: Actually, having said that, this might be a place to answer that question. So do you want to say something? Or, Melanie, did you just -- I mean, I think you can answer very quickly.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: The point estimate approach is where you estimate cancer risk, assuming a single -- that everyone breathes at the same rate, for example. A stochastic approach incorporates variabilities in the exposure so you end up with a range of cancer risks primarily based on

variability in the exposure.

ACTING CHAIRPERSON GLANTZ: Just to expand slightly on that, I mean, basically, the process that's described in this document as you come up with a way of estimating exposure to some chemical, then absorption of the chemical, the biological effects of the chemical, and the different end points that were listed. And a point estimate is to take the best estimate of each of those numbers -- and they'll be talking at some length about how they define the best number and just basically putting all of those into the relevant formulas. So you come up with one number.

All of these different variables have variation in them because different people are different. The level of exposure will vary because of variation in winds and things like that.

So the stochastic model takes into account that variability and then kind of multiplies all those things together. So in the end, instead of getting a single estimate of risk, you get a range of risks and a distribution of risks. Okay.

PANEL MEMBER FROINES: I think this is a very important point that -- and National Academy of Science just spoke to this issue in their 2009 report in terms of dealing with uncertainty and variability. So it's

important to recognize when you deal with variability you're going to come up with more than one number.

ACTING CHAIRPERSON GLANTZ: Yeah, I mean, basically what you do in a stochastic model -- and that stochastic is just a fancy word for take into account the variability. There's really two sources of variability in the numbers that you get. One is just the fact that different people are different, that wind varies, things like that. And then there is also the uncertainty and the estimates, which is something because your estimates aren't perfect. Those end up getting manifest in the same number, the variabilities and the distributions.

But one of the issues that needs to be addressed in looking at each of these different end points is if you're going to pick a best number, what should that best number be? And if you're going to account for the variability, what's the shape of the distribution of the parameters and distribution. So that's where we're now going to go through. So does everybody get that?

Go ahead.

DR. BLAISDELL: So Chapter 2 is the air dispersion modeling chapter. And the Air Resource Board is really the author of this chapter.

There are some changes in air modeling procedures presented in this chapter. AERMOD, which is an update

from ISCST 3, has been endorsed by the U.S. EPA and that's now recommended for hot spots risk assessments.

There is an option for spatial averaging for residential and worker MEI. And the idea behind this is that we base --

ACTING CHAIRPERSON GLANTZ: What is MEI in English?

DR. BLAISDELL: Maximally exposed individual.

PANEL MEMBER FROINES: Stan, may I ask a question? And I'm sorry for interrupting.

ACTING CHAIRPERSON GLANTZ: Sure.

PANEL MEMBER FROINES: The document said AERMOD has been endorsed by U.S. EPA has now been recommended for hot spot risk assessments. As we saw with, for example, methyl iodide, we didn't agree at all with EPA. So the fact that EPA says something is good doesn't necessarily mean the State of California should say it's good. So that I'm assuming that when you say it's now recommended, you're saying that OEHHA has made a determination that this is an adequate modeling method.

ACTING CHAIRPERSON GLANTZ: Okay. But let's let them finish the presentation and then we can come back. I would view that as a more substantive discussion.

So what I'm planning to do after the presentation is to basically go through the report one chapter at a

time, and you can bring that up when we talk about the air modeling. So I would like -- people wanted to let them get through the presentation, so let's do that.

PANEL MEMBER FROINES: You just have the problem of the Chair in Colorado, so I apologize. I recognize the importance of what you're saying.

ACTING CHAIRPERSON GLANTZ: I'm pretending to be you, John.

PANEL MEMBER FROINES: I apologize. I apologize, because I knew we made an agreement after Bill mentioned what he said.

ACTING CHAIRPERSON GLANTZ: Okay.

DR. BLAISDELL: There is also an option for spatial averaging.

The idea of trying to do spatial averaging came about because for some types of facilities, facilities that are fairly close to the receptor with relatively short stack. And when you determine the highest concentration at the point of maximum impact, the concentration around that point can fall off very rapidly, say within a few feet.

So in order to really improve the accuracy of the exposure estimate, the Air Resources Board and OEHHA looked into procedures for averaging the concentration over a larger area to give a more realistic picture of

exposure.

And we think this option makes sense in some cases. That can be applied to a worker maximally exposed individual or a residential maximally exposed individual. The area that is presented in the chapter is relatively small. It would encompass the area that a worker would move around in during the reasonable performance of their duties or may be a small residential lot. It's at the discretion. It's the option. It's at the discretion of the district or the Air Resources Board. It's worth noting that it would really impact small facilities with a small footprint and would reduce the risk for those facilities that wouldn't have much impact on larger facilities.

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DR. BLAISDELL: I'm going to turn the presentation over to Daryn.

DR. DODGE: Thank you, Bob.

Chapter 3 is breathing rates. Now, in our hot spots risk assessments, we need to assess inhalation, because that's the pathway that's most used. In fact, it's used in every risk assessment. So we have to have a good idea of what the breathing rate is, what we're looking for. We have chronic exposure breathing rates. This is what we had in our previous document. It's what

we have now. This is for long-term daily residential continuous exposure for all our various age groups.

New to this document is eight-hour breathing rates for cancer risk. These are for exposures only during facility operation of about eight hours per day. It applies to residential neighborhoods, as well as off site workers and schools.

And also new is one-hour breathing rates. This was to address the SB 352 mandate for school sites near major roads.

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DR. DODGE: For long-term or chronic exposure breathing rates, we evaluated three approaches for estimating long-term breathing rates. Now, these approaches are all established measures for estimating long-term breathing rates. And by definition, they're all indirect measures in order to get long-term breathing rate averages or distributions.

The first approach is called the energy intake or food intake approach. And this looks at food or calories consumed and the fact that it's related to oxygen breathed in and converted to calories to energy. This employs the laten's equation which converts energy to a breathing rate.

The second approach is called a metabiologic

equivalent approach. And this is essentially a time activity approach similar to what we had relied on in our first or our previous document. This reflects the proportional increase in basil metabolic rate during specific activities. Basil metabolic rate being given a one or slightly less for sleep, for instance.

And number three is a doubly labeled water method, which measures CO2 output from the body and the urine. It's also indirect measure of metabolic rate. And this process involves a participant drinking water that is labeled both -- well, one of -- some of the water is labeled on the hydrogen dude rated water and oxygen 18 on others.

So the output of these two types of water is then measured in the urine over a one- to three-week period.

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DR. DODGE: Now, the paper we used to estimate breathing rates by the food intake approach is by Arcus-Arth & Blaisdell, 2007. This is based on a large two-day food intake survey of children and adults, known as the "Continuing Survey of Food Intake of Individuals." I'll refer to it as CSFII. This is by USDA in 2000.

The advantage of this method is it's a large study. Individual data on food intake, age, body weight, et cetera, and it has nationally representative data for

small age ranges.

The disadvantage is that it only has two days of data. So it may overestimate upper and lower percentiles. Generally, if you want to estimate long-term breathing rates, it helps to have more data over a number of days to cut down on the variability.

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DR. DODGE: The metabolic equivalent approach by U.S. EPA came out in 2009. This is based on separate national surveys of activity patterns and body weights by age. Advantages are similar to the previous method; it's a large study. It has nationally representative data for age groups. Disadvantage is that it does not consider limits on the maximum activity values. So it may overestimate upper percentiles. And this occurs largely due to the fact that there are two separate surveys merged together to get the breathing rates, one for activity patterns and one for body weights.

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DR. DODGE: And lastly, the doubly labeled water approach by Brochu, et al, in 2006. This group assembled a large collection of individual data from a number of different studies. And again, it estimates CO2 production and thus the total energy expenditure over one to three weeks using Laten's equation.

So what we took -- what we did is we took the individual data points and developed distributions based on the data from Brochu, et al.

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DR. DODGE: The advantages of the doubly labeled water approach is that it's the most accurate method for long-term breathing rate estimates. And we had access to a large database.

The disadvantage is that the database was not representative of population, but more representative of sub-populations. For example, we had a large group of adults with -- considered normal BMI, or body mass index. And it was separate from a large study that looked at individuals with a high body mass, or BMI index, of 25 or greater.

Another disadvantage is that different ages were not sampled equally. There was one study that looked at a lot of five- and six-year-olds, for instance, using this approach and very few that looked at three-year-olds.

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DR. DODGE: So with these three different approaches, these are the mean breathing rates in liters per kilogram day. Now when you normalize the body weight, you're going to find that the infants and children values of breathing rates are going to be higher. As you move to

the right to adults, the numbers are going to be smaller.

ACTING CHAIRPERSON GLANTZ: I just have one clarifying question here. How do you get a breathing rate for a fetus in the third trimester?

DR. BLAISDELL: We assumed that the fetus would receive the same amount of air as the mother, so we used the 16 to 30-year breathing rates. And that approach was used throughout the document. It's a simplification, because obviously the fetus doesn't necessarily receive the same dose as the mother. But given the huge array of chemicals and all that and the facts, it's a pretty short period of time, it seemed like a reasonable assumption to make.

ACTING CHAIRPERSON GLANTZ: So just to clarify -- because this is a question I had in reading the document. So basically for the third trimester fetus, you're just assuming for everything the same exposure levels as the mother? I think you need to make that clear.

DR. BLAISDELL: On a per kilogram body weight basis.

ACTING CHAIRPERSON GLANTZ: Go on. I'm sorry.

DR. DODGE: Okay. For clarification, our previous values are in the last row there just for comparison. In our previous document, we looked at zero to nine and lifetime exposure, which was zero to 70.

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DR. DODGE: These are the 95th percentile breathing rates in liters per kilogram day.

The one thing I'd like to point out is that in the zero to two-year column, we have quite a range in breathing rates when looking at the three methods. For example, comparing the met approach and DLW approach, we have nearly a two-fold difference. But when you look at the adults column at the far right, the numbers are pretty close to the same for all three methods. And this reflects the fact that there is a lot more information there for adults as opposed to infants.

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DR. DODGE: So there really is no gold standard method among the three we present here for breathing rates representative of the population. Each method has its advantages and disadvantages.

What we ultimately chose to do is average the CSFII or food intake study with the doubly labeled water study to get our breathing rates. This is because we had the individual or raw data to develop distributions specific to the age groups that we're interested in.

And we used a Monte Carlo simulation to combine the data and develop a stochastic distribution of breathing rates.

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DR. DODGE: So these two methods combined, these are the mean and 95th percentiles that we are recommending, liters per kilogram day at the top there and in liters per day at the bottom.

ACTING CHAIRPERSON GLANTZ: Just again for one point of clarification. Just does shape distribution are you recommending, given these parameters?

DR. BLAISDELL: Well, when we did the Monte Carlo simulations, we asked Crystal Ball the 5th the simulated numbers. And Crystal Ball determined the best fit using the Anderson-Darling statistic.

And so we have a whole list of different distributions which fit each individual age range the best. So we specified the parameters say for the log normal or for the other types of distributions. And we have a whole table in the document of recommended distributions that could be plugged in where the parameters could be plugged into a spreadsheet and you could do a Monte Carlo simulation.

PANEL MEMBER GILL: I'd like to come back to this later.

ACTING CHAIRPERSON GLANTZ: Okay. We will.

DR. DODGE: These are our proposed eight-hour breathing rates. These are based on U.S. EPA metabolic

equivalent minute ventilation rates. We had no such methods for the other two approaches. So we essentially took the minute ventilation rates and expanded it to eight hours. However, we have different categories here of sedentary, light, and moderate activities. So you can kind of tailor or custom fit the breathing rates based on the type of activities people are involved in during an eight-hour period.

So these numbers here in this table represent breathing rates that occur during an eight-hour period. I only put the sedentary, the passive activity numbers, and the moderate intensity activities here. The light intensity activities are published in our document. I didn't put them here.

Now there is also heavy or high intensity activities, but the U.S. EPA distributions for duration of this in particular intensity does not extend to eight hours. In general, it's one or two hours I believe depending on age. So it made no sense to attempt to use that high intensity activities here and for eight hours.

What we would recommend is if there is a high intensity activity going on during an eight-hour period to use the 95th percentile of the moderate intensity.

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DR. DODGE: These are our proposed one-hour

breathing rates for SB 352 purposes. Again, this is just for schools. And this is also based on U.S. EPA minute ventilation rates. And we have sedentary, light, moderate, and high intensity activities here.

So this represents breathing rates over a one-hour period. And we expect these tables to be used to customize breathing rates depending what the children are doing during school hours or the hour that's of interest in order to determine an exposure assessment.

Now, sedentary and passive activities, that generally reflects students in a classroom sitting and listening to the teacher or reading, for instance.

Moderate intensity, that would be PE or recess activities. Now, we include high intensity here because it's conceivable that, for example, after-school sports will involve up to one hour of high intensity activities perhaps like running events or football.

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DR. DODGE: Chapter 4 is soil ingestion. This is mostly soil or incidental soil ingestion. And it could involve hand to mouth activities as well, especially for children who may have soil on their hand and then put their hand in their mouth.

Now, the values we use here for soil ingestion rates are the same ones that U.S. EPA developed in their

Child-Specific Exposure Hand Factors Handbook of 2008. And this approach is based on nine peer reviewed studies. So we recommend basically the same thing that U.S. EPA has.

Now, we don't have body weight data from these individual studies. Therefore, we use age-specific body weight recommendations that we have in Chapter 10 in order to provide soil ingestion rates in terms of milligrams per kilogram body weight per day.

Also data on variability was insufficient to recommend a distribution for stochastic analysis so we just have point estimates.

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DR. DODGE: And these are the proposed point estimates for soil ingestion rates. In our previous document, we just had means. So new to this, our proposed document here, is we added 95th percentiles.

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DR. DODGE: Chapter 5, mother's milk pathway. In our previous document, we just had two chemicals that are known to accumulate in mother's milk. And those were dioxins and furans and polychlorinated biphenyl, or PCBs. In this revised version, we have added polycyclic aromatic hydrocarbons, or PAHs, and lead to this short list of chemicals to be evaluated by the mother's milk pathway.

In addition, in our revisions, we have updated the mother's milk pathway model for dioxins and furans and PCBs.

And finally, we re-evaluated intake rates for breast fed infants. However, this change is very small from our previous recommendations.

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DR. DODGE: Chapter 6 is dermal exposure. And this refers to contaminated soil and direct exposure onto the skin.

Now, in our previous document, we have quite a few variants in the dermal dose equation. We have average concentration of chemical and soil. We have surface area of exposed skin in square meters. We have soil loading onto the skin in grams soil per square meter per day. We have exposure frequency days per year; the ABS, which is a fraction of chemical absorbed across skin. Exposure duration, body weight averaging time to assess carcinogenic risk.

So what we did differently in this go around --

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DR. DODGE: -- is that we proposed combining several of these variants into one overall variant called the annual dermal load, or ADL, which is expressed in milligrams soil per kilogram body weight per year. The

ADL combines the body surface area over body weight, soil loading, the percent surface area exposed and exposure frequency variants.

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DR. DODGE: So the advantages in doing this sort of combining of the variants into the ADL is that the high end of the three variants combined, instead of using one high end from each multiplied together, gives us a better estimate of the variability. It's basically the proper method for estimating overall variability from several sources.

The distributional information that was previously separate is now integrated in one distribution, which simplifies the calculation for risk assessors.

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DR. DODGE: In addition, new to this document, is we divided California into three climate regions for development of the ADLs into warm, mixed, and cold climates.

Now, the reason we did this is because we had information on exposure frequency and percent area of skin exposed based on climate, whether a person was in a warm or cold climate.

So for warm climates, we're talking about areas that may have warm weather throughout the year, such as

the L.A. basin. Mixed climates would be hot summers, cold winters, such as the Central Valley mountain regions. And cold climates would be coastal areas such as San Francisco, Eureka. However, districts should be consulted concerning appropriate ADLs for a particular location.

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DR. DODGE: So this is our annual dermal load table. I just wanted to point out in warm climates the numbers are going to be higher versus cold climates it's going to be a little bit lower. Their annual dermal load is in units of grams soil per kilogram body weight per year.

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DR. DODGE: One other thing we did in this chapter on dermal exposure assessment is that we updated our dermal absorption factors. Again, dermal absorption is expressed as a percent or fraction of the chemical absorbed across skin from the soil. So we reviewed the chemicals specific dermal absorption data that's out there in the literature. In doing so, it takes into account soil type, hydrophilicity of the chemical, soil, organic content, and soil aging of the chemicals and soil time on skin.

And for the dermal absorption factors, we didn't

have a lot of changes in many of the chemicals from our previous document. A few increased, such as led went from one percent to three percent. A few decreased. Mercury, for instance, went from ten percent to four percent. And others remained the same. For example, PCBs remained at 14 percent. PAHs remained at 13 percent.

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MR. BLAISDELL: We're going to switch here.

Chapter 7 is home-raised consumption rates, home-raised produce, meat, milk, and eggs. We used data from the 1999-2000 NHNES data set to estimate consumption rates for leafy, exposed, protected, and root vegetables and fruits, home-raised chicken, beef, pork, eggs, and cow's milk.

The NHNES collected data for one day, therefore, typical intakes for individuals may not be captured. Thereby, the upper percentiles and lower percentiles are likely to be overestimated.

We determined faith in transport parameters for determining food concentrations such as root uptake factors, things like how much soil a pig eats and a whole bunch of things that you may not want to know about.

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MR. BLAISDELL: Next slide, the next chapter is Chapter 8, which is water consumption. The Hot Spots

Program includes a surface water drinking pathway. So far, this pathway has not been used in a hot spots risk assessment, but it is available if it's needed.

The data from the U.S. EPA's Office of Water 2004 and U.S. EPA's Child-Specific Exposure Factors Handbook were combined for various age ranges.

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MR. BLAISDELL: Here are proposed water consumption rates for the third trimester through age 70 for the mean and the 95th percentiles. They also have distributions available.

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DR. DODGE: Back over to me here.

Chapter 9 is fish consumption. This is angler-caught fish.

I think we have a slide missing, but I'll go ahead and do this. This is the first slide of the chapter.

Fish consumption rate is needed for assessment of potential health risks to individuals consuming fish from waters impacted by facility emissions.

In the Hot Spots Program, this is generally limited to fresh water bodies, including lakes and ponds. And this is because the semi-volatile or non-volatile chemicals will deposit in these sources of surface waters

and can accumulate.

OEHHA reviewed existing and new studies for angler-caught fish consumption estimates for Californians. However, the fish pathway is rarely invoked in the Hot Spots Program.

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DR. DODGE: Our proposed fish consumption is based on a San Francisco Bay seafood consumption study published in 2000 by the California Department of Public Health. This replaces the fish consumption estimate we had our previous document based on the Santa Monica Bay seafood consumption study from 1994.

Now, the advantages of these two studies is that they include an ethnically diverse population of anglers fishing. The disadvantage is that they are marine fish consumption estimates, not freshwater fish consumption estimates. However, looking at the freshwater fish consumption studies from other states, it compares pretty closely to what we find for marine fish consumptions. Marine fish intake is probably slightly higher in some of these studies compared to the freshwater fish consumption rates.

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DR. DODGE: These are our proposed fish consumption rates for children. In most cases, this

represents the fisherman catching their fish and bringing it home to their families.

The previous values there are on the right, the last column, the nine-year scenario. That's what we used before, and that was based on the Santa Monica study. You can make a comparison to what we're proposing for the two to nine year group. If you look at the bottom rows there in consumption rates of grams per kilogram body weight per day, the numbers are fairly close -- well, in fact, based on the study that we're proposing, the consumption rates are slightly less, but not too much there.

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DR. DODGE: This is a table of our consumption rates for adults. Again, the last column there on the right is our previous values. And you can make a comparison to the values we're proposing. The values we're proposing are slightly less than what we had previous.

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DR. DODGE: Chapter 10 is body weights. Now, most variants in our exposure document already incorporate body weight into the analysis. But in a few cases, such as fish consumption and soil intake, body weight information was not provided, so we needed the body weight variant. That was specific to the age groups we were

looking at.

The key study we used for body weights is the National Health and Nutrition Examination Surveys, otherwise known as NHNES. This is the most current information on body weight for the U.S. population, and it's been a continuous survey since 1999, being updated roughly every two years or so.

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DR. DODGE: These are the means that we're proposing based on our age groups. And again, over on the right-hand side the last column, those are our previous values.

So I'll turn this over to Bob to finish up.

DR. BLAISDELL: As you can see, the population is getting heavier.

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DR. BLAISDELL: Chapter 11 contains information on a variety of topics, including: Residential exposure duration -- essentially how long people live in their houses, time at home for residents, and exposure duration for off-site workers. It also contains a discussion of individual versus population risk.

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DR. BLAISDELL: We're proposing a 30-year exposure -- residency exposure duration, which is around

the 90 or 95th percentile for residence time. The data were obtained on California residency time from the American Community Surveys. The California data are generally consistent with nationwide data.

We're also recommending that a nine-year and 70-year scenario be included. And the nine year is approximately the mean of residency time and 70 years would represent a lifetime residency exposure duration.

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DR. BLAISDELL: Worker exposure duration. Risk to off-site workers near a facility is included in the Hot Spots Program. Risk to off-site workers is evaluated using the same health values as for the public.

In other words, we don't use occupational health values, which are generally higher. Workers that are actually employed at the facility being evaluated are covered by Cal OSHA using occupational health standards. The length of time that a worker is on the job with a specific employer, i.e., job tenure, determines the exposure duration.

PANEL MEMBER FROINES: Why is it the length of time that is on job with a specific employer? I've been a chemist for 50 years.

DR. BLAISDELL: Well, John, the Hot Spots Program looks at the risks from emissions from a particular

facility. So you can be a chemist all your life, but we're only looking at an individual facility. So if you changed jobs and move off to another facility and also to do chemistry, we wouldn't consider that time. That's basically part of the legislation.

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DR. BLAISDELL: Worker exposure durations key study. This is a Census Bureau Survey of income and program participation.

The SIPP, the SIPP sample is a multi-stage-stratified sample of the U.S. civilian non-institutionalized population. Workers are asked when they started working for a current or most recent past employer and when they stopped working for that same employer. This is an absolutely ideal data for what we want to do. Ideally, you'd have longitudinal data on individual workers, but it is the best available.

The current job definition your data covers 1996 through 2008. And obviously, in this kind of economy, these things can change over time.

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DR. BLAISDELL: Previous OEHHA recommendation, which I believe was the same that U.S. EPA used in some of their programs, is 40 years for employment tenure. We're proposing to use 25 years for employment exposure

duration. It represents a reasonable estimate of the 95th percentile of employment duration from the SIPP.

The study is supported by less rigorous surveys that ask questions regarding length of employment with a specific employer.

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DR. BLAISDELL: Individual versus population risk. In this version of the document, we wanted to more clearly separate out the concept of individual and population risk. In the previous version, we were recommending a 70-year exposure duration, which sort of mixes two concepts: Population and individual risk together.

In the previous version, we also assumed that the residential maximally exposed individual is exposed 24 hours a day, seven days a week, 365 days a year to facility emissions at the maximum impact point, which there is a certain amount of -- it's not incredibly realistic in terms of typical exposure.

One of the issues with individual versus population risk is that a small Facility A may have a small zone of impact. In other words, a dry cleaner or a gas station where few people are impacted at relatively high cancer risk, and the risk will drop off pretty rapidly around these facilities.

In these circumstances, the individual risk is above acceptable limits and risk management is triggered, which is appropriate. However, you can also have a large facility with extensive but diluted emissions. Maybe the facility has many, many stacks or a lot of the emissions are area source emissions and can have a huge footprint. Thousands of people can be impacted. But because the emissions are diluted, the risk is below the triggers for individual risk and risk management would not be triggered.

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DR. BLAISDELL: In the past, risk assessments have recorded a cancer burden, which was simply the number of people exposed times the cancer risk, which this would often come out to be .4 something and weren't intuitively obvious to the general public.

OEHHA recognizes a need for more focus on the population applied risk to capture the example where many people are exposed to an acceptable cancer risk, say, in the 1 times 10 to the -6 range.

We recommend reporting the number of people exposed within the cancer isopleths to 10 to the -6 and higher to give a clearer indication of the population-wide health impacts from facility emissions.

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DR. BLAISDELL: Activity patterns.

Previous exposure to the residential MEI, as I mentioned earlier, was assumed to be 24 hours a day, 365 days -- actually, I think we gave people two weeks off for vacation. But for 70 years.

And the Air Resource Board and OEHHA looked at some survey data to try to see if we can come up with some information on the fraction of the time that was spent at home. And we also -- in these estimates, vacation is also included. So the data indicate that about 85 percent of your time is spent at home between ages zero to two. And essentially 72 to 73 percent of your time from ages 2 to 16 and 16 to 70.

One of the issues with considering time away from residence is that it's not known where the person is when they are away and therefore, if the person was still exposed to facility -- significant facility emissions.

In other words, if you're just going down the street to school or the place where you work is located within the isopleth of a really large facility, it may not do you much good to leave for work or school.

For the purposes of estimating cancer risk from a specific facility, we're recommending that there is no exposure from the facility when you're away from the residence, unless there is a school within the 1 times 10

the -6 isopleth. That would generally be an indication that the facility was large and potential for exposure to children.

Again, this is part of trying to come up with some more accurate ways of estimating individual risk and clearly separating out the concepts of individual risk and population risk.

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DR. BLAISDELL: And now the summary. The updated draft exposure assessment guidelines incorporates new data on exposure parameters, including transport published after the 2000 version. It updates the air dispersion modeling, including -- and includes an option for spatial averaging. The age ranges for exposure variants accommodate the assessment of the greater risk from early in life exposure to carcinogens. We're attempting to emphasize population risk more. And the residential and worker exposure duration are based on newer data.

Thank you for your attention.

ACTING CHAIRPERSON GLANTZ: Okay. Do you want to say anything, Melanie?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Yeah. I just want to say we do have some slides on the public comments in our responses. So I don't know if you want to hear them or see them or you want to wait a

little bit.

ACTING CHAIRPERSON GLANTZ: Why don't you go through those?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Take five so we can get that presentation up.

ACTING CHAIRPERSON GLANTZ: While they're getting the presentation together, what I would suggest -- I know we've been sitting here a long time, but it is also a long report.

And I mean, I think we have two options. One is to take a break after OEHHA finishes, but it is kind of lunch time. We could break for lunch. Or what I would suggest is that we go until, say, 12:00 to actually start the discussion. Go until 12:30 and then just break for lunch for however long we decide so we can get -- because I think it's going to be -- I mean, I think the report is pretty good, but I think there are issues to discuss. And I want to have adequate time.

So are people willing -- I know it's a long time to sit, but are you willing to do that, go to 12:30 and then we'll break for lunch? Okay.

PANEL MEMBER FROINES: I'm concerned about the reporter. We always take breaks so he has a chance --

ACTING CHAIRPERSON GLANTZ: It's a she. She's fine.

So I think everybody else thinks we should go until 12:00. So it's not that much longer. But I'm afraid there is no such thing as a short break at a meeting like this. Are you guys ready to go there? We're going to go until 12:30 and then we'll break for lunch.

Okay. There were not a lot of public comments, so this should go pretty quickly.

DR. BLAISDELL: This is a short presentation of our of the public comments that we received and OEHHA's response to those comments.

We received comments from the Santa Barbara Air Pollution Control District, the Western States Petroleum Association, otherwise known as WSPA; the County Sanitation Districts of Los Angeles County; the Natural Resource Defense Council, NRDC; and the U.S. Environmental Protection Agency, U.S. EPA.

This presentation summarizes the significant comments of general interest. We have a much more detailed Response to Comments posted on OEHHA's website.

ACTING CHAIRPERSON GLANTZ: And all the members got the Response to Comments, too; right?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Yes.

DR. BLAISDELL: These are the comments from the Santa Barbara Air Pollution Control District. A comment

to explain the early in life weighting factors and clarify that the hot spots analysis and reporting program will reflect the proposed values.

The HARP Program is a program that was developed by the Air Resources Board. It has a number of functions, but it's actually the preferred program for performing hot spots risk assessment and includes everything including the air modeling, faith in transport, and the exposure variants. And so when the document is finally approved, the HARP Program will be re-programmed with the proposed values.

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DR. BLAISDELL: These are the comments of the County Sanitation Districts of Los Angeles County.

Comment: Simple table showing a single age-weighted breathing rate against percentiles similar to Table 3.23 in the previous version of the draft TSD would be beneficial for those calculating Tier 1 point estimates.

We think they were a little confused about what we were doing. Unfortunately, the age ranges are different, so such a table is of limited benefit.

The previous breathing rates are presented in Chapter 3, and you also saw them in one of our slides here. The proposed breathing rates are not radically

different from the previous breathing rates to the limited extent that they can be compared.

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DR. BLAISDELL: These are comments from NRDC.

The NRDC urges OEHHA to encourage presentation of risks from multiple facilities.

We agree that cumulative risks from multiple facilities is important, and we actually have a document on our website that addresses cumulative risks. But the Hot Spots legislation specifies that hot spots risk assessments only consider emissions from the facility in question. The HARP Program actually can do multiple facilities if people are interested in doing that.

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PANEL MEMBER FROINES: Cumulative risk issues are very important and very badly dealt with generally.

DR. BLAISDELL: The NRDC is concerned that daily or yearly variability in emissions could lead to a significant underestimation of exposure. NRDC is particularly concerned with persistent and/or bioaccumulative contaminants. Long-term exposure estimates based solely on annual averages could significantly underestimate parameters.

And our response is that estimation of the variability in hourly emissions from industrial process is

not generally available. However, if the annual average emission rate is properly determined, estimates of cancer and non-cancer chronic risk would probably not be underestimated, even with bio accumulative contaminants.

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DR. BLAISDELL: The estimates of acute maximum one-hour concentrations consider worst-case one-hour emissions where appropriate. For some types of facilities, we get start-up conditions and that sort of thing.

Emission estimates are intended to er on the side of over-estimation, not under-estimation. However, if the emissions estimates are inaccurate, the risk estimates could be seriously underestimated.

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DR. BLAISDELL: The list of contaminants for which this mother's milk pathway is to be evaluated does not include all air toxics for which there is evidence of exposure through breast milk ingestion. Inhalation exposure to volatile organic compounds, including Benzene, Toluene, and Tetrachloroethylene has been found to result in elevated levels of these compounds in breast milk.

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DR. BLAISDELL: We actually took a look at this issue and determined that the exposure to the breast milk

pathway through volatile organic chemicals was pretty insignificant relative to the infant's exposure to inhalation. And the inhalation pathway would be assessed for the 30 years of that infant's -- first 30 years of that infant's life. So it does tend to swamp out the small amount they get through the breast milk pathway.

The chemicals of most concern for the breast milk pathway with low level environmental parameters are those with a long half-life in the mother's body that accumulate in the mother's body, such as dioxins that accumulate and fat. And they're very slowly eliminated.

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DR. BLAISDELL: These are the comments of Western States Petroleum Association. They say, "We support the proposed changes to the default values for exposure duration for the residential and worker. As noted in the TSD, a 30-year residential exposure duration is a reasonable estimate of the 90th or 95 percentile of resident's time. Similarly, for the workers, 25 years represents a reasonable estimate of the 95 percentile, and these proposed values are consistent with default values used in other regulatory programs."

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DR. BLAISDELL: And essentially, we were pleased that there is availability on these parameters of

employment duration and activity patterns and exposure duration which allowed us to refine our exposure model.

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DR. BLAISDELL: The derivation of breathing rate point estimates to be applied for exposures of less than 24 hours per day -- for example, the eight hours is unclear. It's also unclear how to translate a one-hour breathing rate to an eight-hour or other exposure time, breathing rate for a school child, off-site worker, or other receptor.

We have clarified the application of the breathing rates for the off-site workers in Chapter 3. OEHHA has added -- actually that should be moderate. We've added heavy intensity and light intensity of breathing rates so that a greater range of worker breathing rates are available for different options. I think we added the moderate.

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DR. BLAISDELL: It's well documented that outdoor air is not -- well, the concentration of outdoor air is not well correlated with indoor air, at least based on centralized ambient air monitors and is very poorly correlated with personal exposure.

Indeed, indoor air quality is a function of ventilation, such as open windows, air conditioner use,

building construction, and a myriad of other activities, such as cooking or cleaning.

We agree it's true that indoor air concentrations may well not be correlated with outdoor air concentrations, and also that concentrations of chemicals found indoors -- found in the outdoors may be lower than the same chemicals indoors due to indoor emissions sources.

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DR. BLAISDELL: However, the purposes of the Hot Spots Program is to provide a public right to know concerning emissions and risk from stationary facilities in the proximity of residents and off-site workers. Since the ultimate source of indoor air is outdoor air, the assumption that the modeled annual average concentration of indoor air from facility emissions would be reflected indoors appears to be valid.

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DR. BLAISDELL: Comment from U.S. EPA. Using the doubly labeled water for ages 0 to 2 and the means of all of the studies for the other age groups for the long-term daily estimate for chronic risk assessment would generate a higher high-end liters per kilogram day value for the 2 to 9 age group than the 0 to 2 age group, which is contrary to what's physiologically possible. And the same

thing is true for the 95th percentiles.

Our response is that we agree that it's physiologically implausible that the high end 95 percentile breathing rates on a per kilogram body weight basis would be higher than in the age 0 to 2 group compared to the 2 to 9. I'm sorry.

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DR. BLAISDELL: Our response, the choleric intake method will tend to overestimate breathing rate because it does not capture typical choleric intake with only two days worth of survey data. In other words, it's not longitudinal data on each individual.

We took another look at this, and the met method is less certain than the other two methods because of the upper percentiles exceed the limits of sustainable activities, and also the body weight data was not on the same individuals as the activity data.

We re-evaluated our approach and decided in the interest of a consistent approach for each age group to average the doubly labeled water method and the total choleric intake CSFII method for all age groups, including the 0 to 2 years, and not the average in the met method, which has more uncertainty than other methods.

And this concludes our presentation.

ACTING CHAIRPERSON GLANTZ: Melanie, did you want

to add anything else?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: No. Just one little quick point. I'm not sure it was totally clear in our response, but the concern about indoor air measured concentrations being different than outdoor air, yes, everybody recognizes that. But the comment alluded to central site monitors, and that's not the data we're using. We're using air dispersion modeling from a specific facility that is near to the residential or off-site worker receptor. So it's not quite the same thing.

And we actually do have a few facilities where indoor air measures of specific chemicals were pretty well correlated with the sites around them. So the sources of emissions around them. So we didn't think it was -- for our purposes, yes, we all recognize that changes happen in indoor air. You use cleaning products. There's building materials off-gassing, but we're looking at the risk from the specific facility.

ACTING CHAIRPERSON GLANTZ: Okay. Well, what I would propose -- and so again, we'll go for about another 25, 30 minutes. The court reporter is smiling. So what I would suggest, this is a long, complicated report. I have just a couple comments.

First of all, I think we can predict with

reasonable probability that we are not going to vote on this report today, especially since a few important people aren't here.

So I would ask the Panel in making your comments if you have relatively minor points or small corrections to just give them to Melanie and not -- I don't think we need to talk about them here, because this report will be coming back at least one more time.

And then the second thing that I would suggest is that we go through the report a chapter at a time and get people's comments on each of the chapters, starting with Chapter 2 and then come back and talk about sort of the global issues and the introduction last.

Is that okay with people?

PANEL MEMBER NAZAROFF: A few of the comments I have are overarching.

ACTING CHAIRPERSON GLANTZ: Do you want to start with that?

PANEL MEMBER NAZAROFF: Sure. We could do that.

ACTING CHAIRPERSON GLANTZ: Is that okay?

PANEL MEMBER FROINES: Stan?

ACTING CHAIRPERSON GLANTZ: Yes, John.

PANEL MEMBER FROINES: I couldn't tell who was speaking.

PANEL MEMBER NAZAROFF: Sorry, John. It's Bill.

ACTING CHAIRPERSON GLANTZ: Bill Nazaroff.

PANEL MEMBER FROINES: Thank you.

ACTING CHAIRPERSON GLANTZ: If you want, why don't we start -- that was the other alternative. So why don't we start with the sort of discussion of the broader issues raised in the report. And then after we do that, we'll try to go through and focus on specifics. Is that okay? I just think mixing them will really lead to kind of a confused conversation, I think. So why don't you go ahead.

PANEL MEMBER NAZAROFF: Okay. Thank you.

So I think then what I'd like to do is to provide some overall comments now. I've sent to Melanie just this morning just in time for the Committee work my full set of comments, which numbered 47, about a third of them I want to call out. I'll only highlight the first several now and then the rest are tied to specific chapters.

Of course, this is an impressive document in both scope and depth. And in reading it, I really was trying to focus on three main points.

First is what is done is what is reported here done correctly.

Second, what is missing? Are there blind spots that lie within the purview of the hot spots mandate and SB 32 and are just not addressed. I mean, not addressed

effectively or at all.

And third, how might the document itself be improved as guidance. And so in terms of the overarching or general comments, one overall one is that I'm missing in our -- in what's presented to us the evidence from the field. What kind of feedback does OEHHA have, does ARB have? How is that feedback being used to help shape this guidance document? This is a different time than when the document was first put together. You have ten years of experience of the document being used. It's part of a control system. The control systems need feedback in order to be operating effectively. That may be happening. We're not seeing it. If it's not happening, it needs to happen. If it's happening and we're not seeing it, maybe that's okay. But it was a concern to me as I read this.

And let me just continue with a few more points rather than interjecting with discussion here. I have a bit of a concern or suggestion say for the general presentation style. I liked the layout in terms of chapter by chapter coverage and appendices that go into more details. But within the chapters, I really was looking for something that was closer to the way that the chemical identification report works where there is a very clear conclusion at the beginning. The set of recommendations was presented at the beginning of the

chapter, and then if you want to see all the details --

ACTING CHAIRPERSON GLANTZ: Just for the record, I didn't put him up to suggesting that.

PANEL MEMBER NAZAROFF: Where I hit that more acutely than anywhere else was on breathing rates. I had to wade through -- and I couldn't tell where I was going to get to a lot of text and a lot of tables. I finally came to something that said EPA's recommended breathing rates, but that wasn't OEHHA's breathing rates. And the text referred to these recommended breathing rates. And I had to read a few more pages. Anyway, you get the broad point. And I think every chapter would benefit, the reader would benefit from having what it is you're recommending in the end put right up front and then support it afterward.

Third point, I struggle -- and this is a comment and not a suggestion. But I struggle with the imbalance in the levels of attention and precision. It felt to me like there is a real need to do a sensitivity analysis of the overall exercise, because we get a contrast between some data that are input parameters that have an exquisitely rich empirical basis for -- we get reporting with five significant figures in some places. The significant figure police have to go through this document to kind of dial back on where it's gotten out of control.

That's a small side point.

The broader point is that there are other key aspects of the guidance where there is one sentence that declares what's being done without adequate support for that declaration. Specific example of that is in the treatment of the age -- I've forgotten what you've called them. The age adjustment factors for connecting exposure to risk, factor of ten for young children, factor of three for some other group. If that's 10 or 20 or 5 in that first group, that makes more difference than any of the detail about how breathing rate is being handled. There was a reference I found it --

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Bill, this panel reviewed a giant document just on that in 2000.

PANEL MEMBER NAZAROFF: But the reference in this document to that document I typed in the URL in my computer and I got "document doesn't exist" or couldn't find it. So, you know, a little bit more needs to be done here to connect that mammoth document to what's presented in this location.

And it's a broader comment than that one specific point. And that is just -- and again, this is a comment and not a suggestion in this respect that I don't know how to reconcile the parts of this problem that we can do with

exquisite precision. And should we continue to, like, dive more deeply in when there are other key parts of this problem that we can only say, you know, here is a factor of ten or a factor of three that we're using to make an adjustment. Some kind of rationalization of that, I'd like to see us make some progress on.

I have one other thing I think I want to bring up as a broad comment. Yeah, this goes to the sort of whether there are blind spots or not. And I have a couple that I think I've identified. So I just want to mention one right now. There is a sentence -- so this concerns dermal exposure and the dermal exposure pathway. The way dermal exposure in this document is treated is that contaminant is emitted into the air. It has to be either semi-volatile or condensed phase species as a particulate matter. Deposits onto soil. Can accumulate over time in the soil. People come out and they play in the dirt or they garden or they do whatever. They get dirt on their hands. And then before they wash the dirt off their hands, there is some transfer to the skin and it goes in.

And the thing I'm concerned about is that that is a narrow view of what dermal pathways might look like. There is a sentence to sort of justify this approach that I think is quite important. It shows up in Chapter 6, the first page of Chapter 6. But it's unsubstantiated, and I

don't believe it. The sentence says, "Although dermal exposure to volatile chemicals can be significant with the high air concentrations found in industrial settings, this pathway is not a significant exposure source for lower environmental air concentrations, both relative to other exposure pathways and in terms of the magnitude of the dermal dose."

It's increasingly known that chemicals that have this property known as amphiphilicity -- I had to look this up. Somebody taught me this word a few years ago. It's chemicals that have both lipophilic character but also a hydrophilic character because of the functional groups, that those actually have pretty good trans-dermal permeation potential and will readily partition from the air into skin surface oils.

And the choke point then for dermal uptake directly from the air may be a lesser resistance than having to go through our inhaling air in order to get lung exposure. I think there are important volatile and semi-volatile parameters that are trans-dermal, that occur from environmental encounters with these species and that ought to be included in an aggregate exposure assessment or at least carefully looked at and demonstrated that they aren't important. I don't find the sentence does that.

Those are my general comments. Thank you.

PANEL MEMBER GILL: I have two general comments. Actually, the document is very --

ACTING CHAIRPERSON GLANTZ: Sorry, Sarjeet Gill, for John.

PANEL MEMBER GILL: This document is rather extensive. Reading this was a task.

I would say, for example, one of the things is actually -- Bill has already talked about summary actually would be an ideal thing to do. But I want to go further and say what you need to do is based on your experience in the past how has this document effected implementation. And give examples of if this is a scenario, how would this be implemented. Because that is example a lot of times individuals in the comment section say how does it effect us. How does it implement. I don't know whether it's legally possible to do this, that if these other concentrations are observed in a certain environment, how would you be implementing those, given those examples.

You can take a real life example where you implemented those, how would the new document effect that implementation. And so that would be an example giving a case study scenario that has been done. I don't know whether you want to do it legally or not. So that is an issue I think we need to address and see. If not, the alternative is you can put up another scenario which is

not legally binding, but is a potential area that not covers all aspects, but certain aspects of how a certain particular part of the document will be implied. So it's a bit more -- it's easier to read through some of the details that is present in the document is relatively difficult to read and talk about this implementation, for example.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Yeah, I should bring up that is -- well, there are two things.

There is a guidance manual that gets produced by ARB and OEHHA for people actually doing a risk assessment. And the guidance manual exists right now, except for it's got the old -- the 2000 version exposure parameters and variants in there. So we can't produce that document until we come to some agreement with the panel on this document. So there is that.

And then Bob mentioned the HARP Program, which is also waiting for this document to be done and then that will be reprogrammed with the newer exposure variants.

So it's a little bit complicated to try to compare what's going to happen with this new exposure parameters for a whole bunch of reasons. That's a couple of them.

The other issue is that for some of the

chemicals, the actual health values have changed. So some of them have gone up. Some of them have gone down. It's just really kind of a -- it's a really difficult proposition to try to do what you're asking.

ACTING CHAIRPERSON GLANTZ: But I think -- I mean, I did not put these people up to this. I mean, as the lead, I've been talking to Melanie and the others about this. I had a similar suggestion.

I do think though that it would really help, make the document easy to understand if you could at least give an example, you know, which could be -- I mean, I hadn't thought of using a real one from the past with the updated numbers or even one that was hypothetical, just to show how all the pieces would fit together. I mean, that's sort of what you're suggesting, right. Yeah. It would really, really help to make the document comprehensive, more comprehensible and to kind of put things into some context. I mean, there wouldn't necessarily have to be every little detail thing, but to just show how to reduce the level of abstraction.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: We could do that probably by pathway. It would be really hard to try to combine all the pathways and show a difference, for example, for a multi-pathway chemical. We can do calculation for an inhalation exposure to a

carcinogen. This is what it would have looked like using previous --

ACTING CHAIRPERSON GLANTZ: No. No. I don't think what's being suggested is to show how things have changed. I don't think that's so important. I think the thing is to just give an example of how the information in the document would be used going forward. I don't think you need to go back and compare it to the 2000 model. I'm just saying -- maybe that was when we talked about this earlier -- I don't think you need to say, well, the old way led to this and the new way leads to that. I think it should just say if you want to take this model and do a comprehensive risk assessment of some kind of facility, for example. Because if you look in the appendices, you have some example air distribution models for different things.

And I would say you could take one of those or a couple of those and just say if you had one of these example facilities from appendix whatever it was, then how would you then use what's in here to do a risk assessment for a hypothetical facility. I don't think he's suggesting -- and I certainly wasn't suggesting that you compare it to say how it's changed compared to the old document. I mean, this is superseding the old document. So I don't think you need to go back to that. I mean, is

that right?

PANEL MEMBER BUCKPITT: That's true.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Well --

PANEL MEMBER GILL: That's true.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: That really awaits the reprogramming of HARP, because you can't take all this data and crank out an assessment without some software.

DR. BLAISDELL: Just programming all this in is really pretty complicated.

ACTING CHAIRPERSON GLANTZ: Well, would it be possible to sort of outline what the steps would be and sort of which data would be used in that case, just to give the thing something -- a kind of a more concrete foundation to interpret the massive amount of detail.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: That's in the guidance manual. That's what the guidance manual does. So we have the old guidance manual from the previous document, and we have to update that to reflect the newer information.

It may be useful to look at the old guidance manual and see how it says. Because what we refer to it as the cookbook, this is how you do a risk assessment. And it's essentially condensing all of these technical

support documents into a how-to.

DR. BLAISDELL: It contains the health values. It contains the algorithms --

ACTING CHAIRPERSON GLANTZ: I think we're suggesting something simpler than that which is to just take a -- not a general -- we're not saying write the guidance manual now. But I think it would really help to just take a for example if you had this, here's how you would use what's in here in one specific case.

PANEL MEMBER GILL: The main issue that's going to come up is what's the legality between this document and how you implement the guidance manual. Okay. Because that would be part of a legal issue. And I don't know whether that is or not how you -- because if you suggest this is an example, then it can be used as an example in a legal situation that this is the case.

So that's why I'm suggesting is that you want to be very general in your approach, but saying these are some of the issues we need to look at. And that can be put in a very simple format. Because a guidance manual I assume would have much greater detail. Because how big the guidance manual is, if this is a guidance manual it is about a third of the thickness and it's too big in my sense, because it actually -- you lose in all the details you lose all the concepts that you have. That's what I'm

trying to get at.

DR. BLAISDELL: The guidance manual will actually be pretty short, maybe 100 pages.

ACTING CHAIRPERSON GLANTZ: Do you have anything else?

PANEL MEMBER GILL: No.

PANEL MEMBER BUCKPITT: I have a specific comment.

ACTING CHAIRPERSON GLANTZ: Alan is talking now, John.

PANEL MEMBER BUCKPITT: In this, I'm not sure it's possible to do, but some discussion of internal dose. I mean, we make the assumption that if you breathe more rapidly that you take in more compound. But I don't think those things are necessarily proportional. They're very dependant sometimes on metabolism. They're dependent on the exposure rates. The same would go to what Bill said about skin absorption that's there for a few minutes. It's the likelihood of penetration is going to be a lot less, even though it's a detergent, as you pointed out. I'm not sure we can do anything with those parts of the equation, but I'm sure that they do contribute to the internal dose and how much gets in.

ACTING CHAIRPERSON GLANTZ: So John, did you have anything?

PANEL MEMBER FROINES: Can I ask Alan a question based on what he said? Because I agree with him, and I made some notes earlier to myself.

It seems to me that the whole issue of toxicogenetics needs to be explicitly addressed. And that I don't quite know how the easiest way that would be.

But the example of internal dose that he just talked about is extremely important. And breathing rates is -- and just looking at breathing rates is a vast over-simplification of the issues. So I'm not sure how one -- what to recommend. But it does seem to me that Alan was right on target. So was Bill about the dermal issue, which is -- I had to live with on the methyl iodide case, where -- I won't go into it. But it was a major issue.

DR. BLAISDELL: To the extent that we can in terms of the pharmico genetics and pharmico dynamics, they're taking into account in the dose response. In other words, if we have an animal study and we're studying humans, we will take into account internal dose. So it's not really part of this document.

Some of these assumptions in terms of the percent absorbed say for volatile organic chemicals when you're inhaling it, we've simplified that. But there aren't a lot of data often on these individual chemicals. And it

is -- if you're going to make -- if you're going to get into that, then you have to have data on individual chemicals.

ACTING CHAIRPERSON GLANTZ: Anything else?

John, did you have anything else?

PANEL MEMBER FROINES: Well, I think the comments that have been made have been terrific. And I'll come back later and take an opportunity to comment that I think is necessary, but I think right now we can move ahead.

ACTING CHAIRPERSON GLANTZ: Okay.

PANEL MEMBER FROINES: But since you are the lead, Stan, we normally would start out with the lead --

ACTING CHAIRPERSON GLANTZ: Right.

PANEL MEMBER FROINES: -- making the first comments. And in this situation, it's backwards. So I would be interested in hearing what your major comments were.

ACTING CHAIRPERSON GLANTZ: Well, I just decided we could do things backwards today. Basically, my major comments have been made.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Does that mean you'll approve the document first and then we'll talk about it?

ACTING CHAIRPERSON GLANTZ: No.

(Laughter)

ACTING CHAIRPERSON GLANTZ: No, I think, as I commented to Melanie about, I didn't put anybody up to saying the things they said. I mean, I think my major comments have been -- on the document as a whole been made.

The one other major comment that I had -- which has already been partially addressed in her revision of the document -- is I think that there needs to be more discussion of the logic behind the different tiers and when you would use which tier.

And as you noticed, you probably didn't look at it in the document until recently, but there was some -- they sent you a rewritten Chapter 1 that spelled that out a little bit more. That was my one other comment. I still think that needs a little more work.

And the other thing, which was I thought clear in the presentation at the end, but I didn't think was very clear in the document is this issue between the most exposed individual versus a large area source where you have a lot of people exposed maybe at lower levels. And it still isn't totally clear to me which of those two approaches ought to be used in a specific situation. It was a little clearer in the presentation, but that was a question I had when I finished reading the document, which I don't think I mentioned before.

And then the other thing about this issue about handling the fetal exposures as being treated as paternal exposures I didn't see anywhere in the document. It may have been in there somewhere, but I missed that.

But otherwise, I just agree with what everybody else said. So anyway, so it's 12:31. I think we came pretty close. So I think this is sort of a logical place to break. And when we come back, I think we should go through it a chapter at a time and get specific comments on the chapters.

I guess the question is where can we eat and how short a break could we take? Because I'm concerned that we're going to run out of time because it is such a long document. So is there any place in the building to eat or nearby? There is a cafe in the building.

Is a half hour too short? Forty-five minutes? Because I'm very concerned we're going to run out of time. Is that okay with people?

PANEL MEMBER FROINES: Forty-five minutes you say?

ACTING CHAIRPERSON GLANTZ: Forty-five minutes. So we will reconvene at a quarter after 1:00 California time. And I hope you can find a place to eat there in Colorado, John.

PANEL MEMBER FROINES: The problem is the place

that Peter arranged for me to sit in this room, there is -- it's outside of town and there is nothing within any perceivable distance. I need more time or less time, but I'll live with it.

ACTING CHAIRPERSON GLANTZ: Okay. We'll reconvene at a quarter after 1:00. Thank you everybody.

(Whereupon the Panel recessed for lunch at 12:33 PM)

AFTERNOON SESSION

1:18 p.m.

ACTING CHAIRPERSON GLANTZ: We can start discussing. So everybody is back. So we're going to go back on the record.

And so Melanie wanted to make a few comments in response to sort of the general comments. And then we'll I think then just start working our way through the document.

Let me just ask one question. In terms of just going through the document chapter by chapter, is that okay? Or are there any parts of it people think are particularly important or troublesome that you wanted to talk? Because we ought to probably put that part first.

PANEL MEMBER GILL: I think we go chapter by chapter is just as easy.

PANEL MEMBER BUCKPITT: I did have one question about body weight. My data are old, but I thought Californians were a little lighter than the folks in Mississippi and Alabama.

ACTING CHAIRPERSON GLANTZ: We'll come back to that when we get to body weight. Of course, that didn't count me in the sample. Go ahead.

PANEL MEMBER BUCKPITT: But that really influences so much of what's in the document.

ACTING CHAIRPERSON GLANTZ: Well, do people want to talk about that first?

PANEL MEMBER BUCKPITT: That's the only reason I brought that up before we do the other.

ACTING CHAIRPERSON GLANTZ: Let's do that then. Let's let Melanie talk, and then we'll do the body weight then and then we'll go back.

PANEL MEMBER BUCKPITT: But that may not be accurate.

DR. BLAISDELL: I think --

ACTING CHAIRPERSON GLANTZ: Let's let --

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Can we start with the general stuff?

ACTING CHAIRPERSON GLANTZ: Let Melanie deal with the general stuff. And then we'll do body weight and then go back and start with Chapter 2.

Go ahead, Melanie.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Okay. So Bill brought up some general points I just thought I would respond to a little bit here anyway.

So one is how has feedback shaped the document? And since that methodology has been out there for ten years now and the various sundry facilities have used it and risk assessments. Just so everyone is clear, when we generated this document, it went to the Air Resources

Board for review. And in fact, they generated Chapter 2 because we are not air dispersion modeling experts.

And also the California Association -- CAPOCA -- California Air Pollution Control Officers Association for their review -- and that's very recent. Prior to that, we were hearing from the air districts and the Air Board and even some of the facilities about areas that they thought were problematic and so have attempted to address those areas. And those are primarily the maximally exposed individual being exposed to the modeled point of maximum impact for 70 years, 24 hours a day, 7 days a week.

So that's where we did more looking into activity patterns and how long somebody lives at a specific residence for the residential exposure duration issue and how long somebody is at a job at one place. So that's where we attempted to deal with that.

Another issue we heard a lot about is for smaller footprint facilities if you look at -- and there's some stuff in Appendix C. If you look at what the dispersion modeling says about the points of maximum impact, it's really a little tiny spot because they have a small footprint. And so the assumption then would be that that person is there for 70 years in that little tiny spot, which of course is not realistic.

So we then had Air Board do a lot of work on the

spatial averaging for small footprint facilities to get away from that conundrum of what concentration do you use in your estimate of individual risk. So those are a few of the things.

Then I think the other issue that's been bothering at least the public healthers is this issue of what do you do at a really big facility. Their maximum exposed individual cancer risk estimate might be just below what would trigger risk management, yet they have a really big footprint and there is a lot of people exposed. So from a population-wide perspective, using the maximum exposed individual cancer risk for risk management doesn't really do enough. It's not adequate. So that's where we try to address this issue of, at a minimum, you have to say how many people are exposed within the isopleth of de minimis cancer risk and higher.

That was some of the feedback that we got over the years. And one of the things we decided to do since we had to reopen the document anyway to look at the age range and exposure factors for each of those age ranges, we might as well try to address, the other things we've been hearing about over the years. So that's for the feedback.

And yes, we agree that the set of recommendations should be presented first and then all the stuff that

backs them up. And I should have listened to Stan, except for he only told me that last week. So that's my excuse.

And the imbalance in levels of precision, we're always running into that brick wall in risk assessment because for some things you have a lot of data and you feel you can be a little more precise. For other things, like all the uncertainty factors, for example, when we do a reference exposure level, we don't have a lot of data so we have to use factors of ten and half logs and that sort of thing.

So that's why you'll see that in any kind of risk assessment guidance. You simply are jumping big exposure -- big data gaps with assumptions. But that's not to say that we didn't explain ourselves well in the document where we didn't.

Anyway, those are my sort of instant feedback comments.

ACTING CHAIRPERSON GLANTZ: One other thing, which I think when I talked to Melanie over the last week or two -- just to put it on the record. One other thing I think you should do when you have these sort of summaries at the beginning is for the stochastic part is to say what distribution should be used and what the parameters for the distribution should be. Because there's a lot of places where you still are just giving percentile means

and percentile points. And I mean, I think that's kind of left over from the way this stuff was presented before. So I would also add that.

So anyway, anything else about sort of general comments that anybody has?

PANEL MEMBER NAZAROFF: Can I add one since you invited?

The list I had ordered here of the way I wanted to present comments, and I cut myself off one short of where I should have. So this one also fits under the heading of general issue of concern in this arena of potential blind spots. And I'm particularly intrigued I guess because it ties into my professional interest, my academic interests, with the challenges that are posed by SB 352, to need to take account of conditions where schools are close to roadways as part of an area of concern.

So I was thinking about, okay, if I'm concerned about children who are in a school that's 30 meters, 50 meters, 75 meters away from a major freeway and I have diesel particulate matter and PAHs associated with that diesel particulate matter, how are those kids getting exposed in that school? And does the document address all of the important ways in which they would be exposed? And I'm not sure it does.

Among the concerns is this particular one. If you have a PAH laden particles, 24/7 the school classrooms are exposed to the emissions from the roadway. Through air exchange, some of those particles will make it into the school, into the classroom. They will settle on surfaces.

I used to live pretty close to a freeway, and we would get black soot accumulating on our windowsills, for example. And then the kids come into the classroom and they're running around and doing whatever and putting their hands on their desk and putting their hands in their mouth and re-suspending the particles that have been settled and not cleaned. I don't know how important that exposure pathway is, but I don't think it's addressed in the guidance document right now. And I think it's potentially significant.

One other line, so it's not just the particulate matter that might be of concern there. I could also envision that semi-volatile compounds emitted from the roadway, PAHs, for example, in this three to four range space where they're partitioning between the particles phase and the gas phase depends upon temperature. Those could be entrained from air exchange emitted from the roadway, entrained through air leakage into the classroom. Under cool conditions, like at 6:00 in the morning when

first rush hour hits, they might absorb onto the indoor surfaces. And later in the day when the kids come into the classroom, the day warms up, the temperatures rise inside the classroom, the stuff may de-sorb and you get an exposure at that time from something that was emitted hours earlier and may not get picked up in an exposure analysis.

So those are specific concerns, but they reflect a broader challenge I would say that I would put as a member of this Board to OEHHA to as part of the process of updating the document to also take the time to re-think whether all of the important exposure pathways have been properly accounted for or thought about, given what we currently know, not when we knew when the 2000 version was assembled.

PANEL MEMBER FROINES: I think that's very important.

This is John.

Because as we've known -- as we in our laboratory know that vapor phase is particularly important. And ultra-fines are particularly important. And ultra-fines are important, especially from the freeway emissions. So that the question is: Have we taken into account all the sources of exposure?

DR. BLAISDELL: Bill, with respect to your points

about resuspension, there's a number of potential pathways that can occur. And we've actually put a fair amount of thought into consideration of additional pathways.

One of the criteria that we used when we consider additional pathways is it going to be a significant risk relative to other risks. In other words, if you're getting a 10 to the -5 risk from ventilation, is calculating the risk from a pathway that gives you 10 to the -8th worth your time and the effort and the additional complexity in terms of developing the model?

And the other consideration is are there really ways to evaluate a particular pathway.

In terms of the resuspension example that you give, there aren't any -- we looked into this in another context. There aren't really good models for looking at resuspension. And my -- kind of my instincts would be it's probably not going to be tremendously significant relative to, say, the inhalation pathway in these situations.

We do consider -- you know, if we have a semi-volatile chemical in a school, the risk assessor would certainly do dermal and soil ingestion.

And there is a number of other examples like that. Chemicals can partition from the air into plants, for example. And if you apply a model, you can calculate

the concentration in the plan. And CalTox did that for a while. It's early insignificant relative to other pathways. So there's kind of that consideration.

PANEL MEMBER NAZAROFF: So thanks for the response.

I agree with the broad point that one shouldn't be investing lots of energy and pursuing things that aren't significant contributors to exposure and risk.

The specific examples that I raised I don't think can be dismissed. And the one of dermal -- for certain chemicals, direct air to dermal, trans-dermal uptake being more important than the inhalation pathway as a contributor to total uptake I believe is true for some chemicals, among those that are included in the Appendix A.

And I'm not so sure about the example I've just given of resuspension of particles that have accumulated on a surface. But I don't think it's going to be an issue of a 10 to the -5 versus 10 to the -8 where you get orders of magnitude difference in what happens during the hours when kids are at school versus what might happen that has accumulated over time in the classroom when the kids weren't at school but gets the activity in the classroom leads to resuspension.

And even if there is not -- I mean, you guys have

gone through really extraordinary lengths to deal with issues like contaminants getting into soil, getting into homegrown food, getting taken in by a dietary pathway.

Even if there is not a great model today for resuspension of particles that have deposited on surfaces, I think you would be able to make as good a case that you could make a reasonable estimate of exposure through that pathway is through these more convoluted chains that are already incorporated into the document.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: I just had a couple more comments about that, too.

Our soil ingestion pathway includes indoor dust. So the total soil ingestion numbers we use are outdoor dirt and indoor dirt. So we have considered that.

I don't think we have the capacity to model for every single facility deposition indoors versus deposition outdoors. So it has to be somewhat crude, because it has to apply to all these different types of facilities. And the resources aren't there to look at every facility from every possible angle.

So we thought, and we still think, that we have considered the pathways that are the most important. This is not to say that there are other pathways that contribute to the risk.

And then in terms of the skin versus inhalation,

I really am not at all convinced that would be true in an environmental setting where you have much lower concentration than in an occupational setting and no protective gear. So for a couple examples. First of all, the surface area of your lung is like a tennis court versus the surface area of skin. And skin is a much better barrier. The lung is designed to absorb gases and chemicals. So I just think that in itself would tell me that it's going to be orders of magnitude difference in risk. So that's one issue.

Not having done that exercise, it's hard to say, but it just seems to me overwhelming that that would not be the case. For an occupational exposure where the person has protective gear on for inhalation but their skin is being exposed, yeah, then the skin becomes a much more important route of exposure. But in a residential scenario where free living people are running around being exposed to air pollution, I just can't see that as being a driver.

DR. BLAISDELL: Also, we're not the only agency in the world that's ever considered these issues. I'm not aware of any agency that considers dermal absorption to environmental chemicals.

PANEL MEMBER NAZAROFF: I'm going to push back because I just spent some months working on a review

article which is published in the In Press section of Indoor Air. It was -- the lead author is Weschler, Charlie Weschler. And the title is something like, "SCOC Exposure Indoors, a Fresh Look at Dermal Pathways." And we pulled together -- it's a literature review or a critical review evaluating literature. And we pulled together information from a variety of sources, including such, for example, pharmaceuticals where dermal pathways are used to deliver certain kinds of drugs because they transmit the chemicals relatively efficiently.

To the point that you raised, Melanie, about the surface area of the lungs versus the area of the skin and the permeability of the lungs, I've spent some time wrestling with that as well, because I know we're going -- what I'm telling you is going against the conventional wisdom what people seem to think today. But I think it's wrong. And part of the reason I think it's wrong is because when you consider what happens in the respiratory tract, that lung is designed to be efficient in the transmission of gases that are not very soluble; oxygen, the key one from the air into the respiratory tract.

The choke point, the critical resistance to uptake via the lung is the amount of air that we inhale for species that are easily partitioned into our dermas or into our skin. And the volume of air that we inhale is

like a half a cubic meter an hour for adults, roughly. Twelve cubic meters a day, something of that order.

So independent of how much surface area you have in your lungs, you can't take up any more than 100 percent of the half a cubic meter an hour that you inhale. Our skin surface area is a couple of square meters. The mass transfer coefficient -- I've sorry I have to talk a little bit of the space that I know reasonably well.

But anyway, the critical factor that we need to translate the potential for dermal uptake to a parallel with the inhalation uptake is to get to a volume flow rate we need a mass transfer coefficient that we would apply to the surface area of the skin.

In indoor settings where the air flow is relatively low, the product of our best estimate of that mass transfer coefficient and our skin area translates to about ten cubic meters per hour, 20 times larger than the rate at which we inhale air. If we're outdoors where the wind is blowing at a higher speed than the typical indoor air movement, that radio, that number is going to be even higher.

So unless the skin is a good barrier, the potential exists for transdermal permeation. There's more delivery of material to the surface of our skin than there is to the surface of our lungs in a volume per time basis.

And for some chemicals, it appears that the skin is just not a very good barrier. And some of those are included amongst the list of things that we regulate. So there are experiments that have been done, not just in the case that you alluded to, which I'm quite well aware of:

Respiratory protection in an occupational setting.

High concentrations. People get high exposure.

But there are experiments that have been done with a few chemicals where people have been put into a chamber facility with and without respiratory protection. And the amount of uptake of chemical tested through subsequent excretion.

And the skin didn't prove to be a particularly effective barrier in that case. You get 50 percent of the total unprotected uptake even when there was respiratory protection.

Anyway, I made the point. I would encourage at the very least take a look at the work that was written up in the paper that we've just published.

ACTING CHAIRPERSON GLANTZ: Which I'm sure you'll be happy to give them a copy of.

PANEL MEMBER NAZAROFF: I will e-mail it right now.

PANEL MEMBER FROINES: Can I ask a question? The

work that we've done in our laboratory clearly shows that ultra-fine particles are taken up by macrophage and epithelium cells. So the ultra-fines penetrate very readily, whereas larger particles don't.

And so my question would be: If we are exposed to diesel exhaust, which is mainly ultra-fines, why would you -- why would one assume -- and I really don't think one should -- assume that there is a dermal barrier? I don't know what that barrier to cellular uptake is likely to be.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: I think these are all -- there is uncertainty in risk assessment. And we just simply don't have the capability of accounting for everything. I'm worried about ultra-fines and nano particles. I'm more worried about nano particles in sunscreens and cosmetics and all that stuff in terms of transdermal absorption.

But we have to stop somewhere and something that essentially has to be practical to apply to so many different facilities.

And I'm interested to see the paper about the dermal absorption. I'm skeptical that it applies to a lot of chemicals because, in fact, the skin is a pretty good barrier for a lot of stuff. Not for Nicotine. There is a great example. We know all these examples. But I don't

know that it's --

ACTING CHAIRPERSON GLANTZ: I think -- I don't want to, like, beat a dead horse here. But I mean Bill is going to send you the paper. I think you should look at it. And then if you don't deal with it in a way which the Committee thinks is appropriate, we'll tell you.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: We certainly can describe that that is an uncertainty and may be a big uncertainty for some chemicals. That's totally appropriate to put in here. I don't know that we have another couple years --

ACTING CHAIRPERSON GLANTZ: I think that if his sort of perspective turns out to be right, though, I mean, it may mean that you need to add more than just -- if it turns out to be real effect, then I think it needs to be added into the part of the report dealing with dermal stuff. And if it's not, then just make a good case why not. But I think the point has now been fairly well established for the next iteration of the report.

PANEL MEMBER FROINES: I think that it's worth trying to address the chemical characteristics that create the situation he's talking about. And addressing that issue of the chemical characteristics could go a ways to helping explain the situation.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF

MARTY: One more point that when we do a risk assessment, we have -- for example, cancer slope factors. Let's pick Benzene based on human exposure. Those people were free-living. The Benzene was inhaled. It was there to be absorbed across the skin. All of that is inherently taken into account in the health value. But an exposure metric is the concentration in air.

So, you know, in some respects, if you try to develop a model to account for dermal absorption of a volatile from air through the skin, maybe you're double counting in terms of if you try to apply the slope factor, then you would have to do something to fix the slope factor to figure out what percentage of that risk is from dermal. To me, it doesn't -- it's not going to be -- it's not going to add a lot.

ACTING CHAIRPERSON GLANTZ: Well, I think all I would ask -- I think that's a good point, too.

I think the issue has been pretty well ventilated. I think rather than continuing to discuss it in the abstract, I think this is something you need to just look at in the report.

Having had this fairly detailed discussion of dermal exposure assessment, which is Chapter 6, maybe we could see if anybody -- because I'm trying to get us through the report. Does anybody have anything else -- I

had actually thought -- without the same level of knowledge, I had certainly wondered about that myself, although I didn't give you a hard time about it.

Does anybody else have anything about Chapter 6 on dermal stuff that we ought to talk about now? And then we could go in order randomly to another chapter. But is there anything else to say about dermal?

PANEL MEMBER GILL: I just had one point in your presentation in the double exposure assessment level, the annual double ADL. How did you come up with the value of where the children under zero to two is lower than the value for two to nine?

DR. BLAISDELL: I think the answer probably is that dermal exposure for baby is less, because they aren't allowed to get in contact with dirt as much.

PANEL MEMBER GILL: I have known a lot of two-year-olds in the soil playing a lot more than actually an eight-year-old is going --

DR. BLAISDELL: The early --

PANEL MEMBER GILL: That is an average of thinking about that?

DR. DODGE: This is Daryn.

I think there is some evidence that the early infants in the first year of age, they're being protected more or less from outside environment and soil.

PANEL MEMBER GILL: My question is where did the values comes from. Not the values, but how you derived that. How did they become value? How did you come to that conclusion? Because it is a fact written, but where did the value come from?

DR. DODGE: You mean the reference?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: How did you get the answer?

DR. DODGE: I can't tell you right offhand. I'd have to take a look here.

PANEL MEMBER GILL: Okay. I would just suggest you re-look at the figure and see if it's correct or not because I'm not so sure. But if it's correct, that's fine.

DR. DODGE: Okay. Thank you.

ACTING CHAIRPERSON GLANTZ: So anything else about dermal?

So let's do body weight next, which is Chapter 10. And I'll let Alan --

PANEL MEMBER BUCKPITT: In looking through those -- and I realize these are the NHNES data. But I wondered in looking at it if you look at some of the charts that partition this out state by state, it's always seemed to me that we here in California are a little lighter than some of the folks.

So does that influence our thinking about some of the issues that really pertain to a lot of the chapters in this document?

DR. BLAISDELL: Well, we would like to have California-specific data. And in some cases with our more ethnically diverse population influences diet and that sort of thing. It's particularly desirable. That's one of the reasons why we used the fish consumption study from California.

But you can't get NHNES data on individual states. So all we have is the national data for NHNES. There was a California study for body weight, but it was self reported. And you know, people sometimes don't fess up in terms of body weight. So the NHNES was basically what we had --

PANEL MEMBER BUCKPITT: The best you had?

DR. BLAISDELL: Yeah. In terms of where we fit in, I think we're around the mid-range maybe toward the lower end. We're not -- we're not like Colorado. I think Colorado is really low. We're not Alabama. So it's just the data that we have versus knowledge are not optimal often.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Also, I think it's important to point out that for a lot of the distributions, we had individual body weights

to use when we did whatever it was, per kilogram body weight. So this body weight data from NHNES was used in the soil ingestion estimates and the fish consumption estimates where we did not have individual body weight in the surveys.

DR. BLAISDELL: For the dietary thing, we had the consumption weight and the body weight for each individual.

PANEL MEMBER BUCKPITT: Yeah.

DR. BLAISDELL: Which is really preferable.

ACTING CHAIRPERSON GLANTZ: Anybody else? Is that everything you want to talk about?

PANEL MEMBER NAZAROFF: One, but it's small, honest.

ACTING CHAIRPERSON GLANTZ: No. That's okay. No, this is good.

PANEL MEMBER NAZAROFF: And I'm just wondering why with so much exquisite attention to detail that when you finally get to your point estimate table in Table 8 you stick men and women together. Especially because, you know, when we come to like third trimester exposure, there is a gender bias, as there is with breast feeding. Why not just leave it with separate treatment for men and women all the way to the end?

DR. BLAISDELL: Well, in most cases, obviously

the third trimester case that you site does make a difference. The differences in the body weight are not huge.

You know, it's basically there is a real trade-off in this model between trying to kind of keep it simple, keep the calculations simple. We can do separate calculations possibly for men and women in some cases. But you know, you're going to have to look at the -- what the tool is trying to do and the purposes that people are applying. In this case, I don't think that additional decision would offer a lot in the practical world.

PANEL MEMBER NAZAROFF: Just my reaction is I find that to be a response that's sort of uneven in my overall sense of the document that there are places where there is a level of refinement down to percent scale. And here, we're talking about a 20 percent difference between men and women's body weight. And you know, to say that's too difficult to take account of and yet we'll do something that has sort of a one percent or five percent effect just seems uneven in the treatment.

ACTING CHAIRPERSON GLANTZ: You know, I hadn't picked up on that when I read the report. But I mean, I think that is a good point. Because if you're -- I mean, if you're just talking about point estimates, then you've got the average person. But I think if you're doing

stochastic estimates -- and this is all in a computer program, there is no reason that you can't. Will either allow for the different distributions or have a bimodal shape. That a single distribution that builds in the fact that the distribution of all body weights isn't going to be normal.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: So I think that a couple of points there that these data were only used to get a body weight for the soil ingestion parameters and for the fish consumption parameter. The soil ingestion parameter is a point estimate, because we don't have enough data on how much dirt people eat to be reasonably -- to come up with some reasonable distribution.

So in terms of stochastic approach, maybe there is a difference for fish consumption on a gram per kilogram weight if we separated men and women. But that would be the only place where it would make a difference to do that in this model, since the other parameters were based on people's actual body weights.

DR. BLAISDELL: Again, I should point out that to some extent, the refinement of the model is also based on the importance to the program itself. We've reviewed about 800 risk assessments. The fish consumption pathway has been invoked in two. So, you know, a lot of times

you're looking at the pathway and the degree of refinement. And certainly, you know, you can refine models by going out and collecting site-specific data, for example. But at that point, then it adds a huge amount of the cost to the program and not an awful lot in terms of value. So that's another consideration in terms of looking at these pathways.

ACTING CHAIRPERSON GLANTZ: Anybody else have anything to say about body weight?

So what I'd like to do now is go to Chapter 3, breathing rates. Because that's probably one of the more important variables in the model I think. So does anybody have anything to say about breathing rates?

Okay. Bill.

PANEL MEMBER NAZAROFF: So actually, this is I think a relatively simple one.

You expressed breathing rates volumetrically. But in the state, we have people who live at different altitudes and experience different pressures. And I didn't see anywhere in the expression that these should be volumes that are normalized to some standard temperature and pressure. But I would guess that at Lake Tahoe, for example, at 5,000 feet, the volumetric breathing rate is going to be higher by 30 percent or something like that because of the lower air pressure.

So it seems that one ought to either express the breathing rates on a massive air inhaled per body mass per time or if you're going to leave it at volume per body mass per time, make it clear where you're doing the exposure assessment you need to adjust to standard temperature and pressure conditions.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: I think that would be better done at the level of the districts doing the risk assessment. Because how many facilities are in the mountains that are being reviewed.

DR. BLAISDELL: That's the thing.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Almost none that I can remember.

DR. BLAISDELL: There aren't very many, but occasionally there's something.

ACTING CHAIRPERSON GLANTZ: I think he's making a slightly different point. And that is if you're at altitude, you're going to be breathing in a different volume of air. You're giving a certain amount of volume per kilogram per minute. And that rate is going to be -- to get the same mass exposure, at altitude, that's at altitude -- that would give you a lower exposure than at sea level, right. So I think it's a small point, but I think it's worth putting in there that the volumetric breathing rates that you're given are all sea level.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: And then we can allow the districts to figure out the adjustment.

ACTING CHAIRPERSON GLANTZ: And then say if you were evaluating a facility that --

PANEL MEMBER NAZAROFF: At altitude, then you have to make an adjustment. The breathing rates have to go up in inverse proportion to the pressure.

ACTING CHAIRPERSON GLANTZ: Not the breathing rate -- well, the breathing volume.

PANEL MEMBER NAZAROFF: The volumetric rate, yeah.

PANEL MEMBER FROINES: I think the compromise is -- Melanie is right, let the districts do it. But put something in there that acknowledges the existence of the issue.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Yeah, John. I'm writing that down so we can put that into the chapter.

DR. BLAISDELL: We'll have to take a look and see about the data that are available for that, too.

ACTING CHAIRPERSON GLANTZ: So any more issues around breathing rates from anybody?

PANEL MEMBER GILL: In Table 3-1, for example, on page 32, you said that the values for infants zero to 11

months and it goes three months are not available data? That's from the paper you sited to, is it?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Uh-huh. These are BQ values.

PANEL MEMBER GILL: It's not available. But actually, the greatest amount of data that is available is actually at that age. Because if you look at infants that are available -- in that particular paper, this is what it stated. But the amount of data that is available for, for example, children who are actually born prematurely and all that, the model data that you just look at, any of the hospital data you can see there is a lot of volume. You just have to search for a short while. You get a lot of data for infants. I don't know if that's highly impacted the data at the end or not, but this data -- although the paper is the paper you sited, which is Ackus-Arth & Blaisdell. And this table is taken directly from that particular paper. But there is a lot of information available on volume rates for young infants, especially in hospital settings.

So what I'm suggesting is that you should go back and look at some of the data, not necessarily based on that paper. But get additional data that is available from hospital settings because there is a lot. And we should be able to get that data and it's possible.

DR. BLAISDELL: We can take a look at that.

ACTING CHAIRPERSON GLANTZ: Anything else on breathing? Okay. So --

PANEL MEMBER NAZAROFF: I have a couple of other points. So I'm not sorry. I'm going make a couple other points.

ACTING CHAIRPERSON GLANTZ: He's proud.

PANEL MEMBER NAZAROFF: I'm proud I'm going to make my points.

This chapter was one where the precision police should take a close look because the four and five significant figures permeate the tables. You can solve the problem maybe by shifting from liters to cubic meters and then whacking off the two or three digits past the decimal point.

But I also -- we just talked about the gender issue for body mass. The gender issue comes up again in breathing rates. It may not be as important there, because when you normalize by body weight, maybe there is not so much difference between men and women. But go back and have a look and think about whether it makes sense to lump the two genders together in these tables or whether they ought to be considered as separate sub-populations.

I'm not expecting an answer. Just a comment.

DR. BLAISDELL: We'll take a look at it.

ACTING CHAIRPERSON GLANTZ: So anything else on this chapter?

So Chapter 4 is soil ingestion. The one comment I had -- and this is stuff I already talked to Melanie about. I mean, some of the -- the distribution of soil ingestion is clearly not normal, because they had at least one or a couple of the studies fit their data to a normal distribution and got negative soil ingestion numbers.

And when I teach statistics, I say if you have a standard deviation that's bigger on the mean on something that can't be negative, it means it isn't normal. So I think that was just kind of ridiculous. And it was just sort of presented as saying, well, the fact that they have these negative soil ingestions means that the mean underestimates the effect. I just think that's -- I wouldn't have even put that in there. I would have just said the study is just bad. The assumptions they made in the analysis made the interpretation of the results almost meaningless.

And then the other thing, which I was very confused by in talking with Melanie and the others, they said, well, the distributional data on soil ingestion is so all over the place that they're not recommending a stochastic approach to that and just using the point estimates. And that was not at all clear to me from

reading the chapter.

So I mean, I believe given some of the bizarre results of the chapter, that's a reasonable thing for OEHHA to recommend. But then it needs to really be stated clearly.

And I think going back to the discussion earlier of having each chapter begin with kind of the bottom line presented in a standard way where you say if you're doing a point estimate model, use these numbers. If you're doing a stochastic model, use this distribution with these parameters. And that you would just simply say we don't recommend using a stochastic approach because of the limitations and the data.

So that's my one substantive comment on Chapter 4. I don't know -- did anybody else have anything you wanted to add about Chapter 4?

Okay. So next -- this is going faster than I thought it would.

What's the next chapter here? Breast milk. So does anybody have any comments on breast milk?

PANEL MEMBER NAZAROFF: I do.

ACTING CHAIRPERSON GLANTZ: We should have made him the lead person.

PANEL MEMBER NAZAROFF: I'm puzzled. And there may be an explanation for it, but I didn't see it in

reading this.

In the equation 5-1, the dose is expressed in a per day I guess averaged over a lifetime. So you divide the intake that happens while an infant is breast feeding by a 70 year lifetime. And I guess I understand how that can make sense if we are thinking about cancer risk and lifetime exposure leading to an increased risk. But is there no case where one would be concerned with an acute effect associated with breast milk ingestion?

DR. BLAISDELL: That hasn't been -- it's generally not considered an acute hazard, particularly with environmental exposures. The things you would be concerned about is primarily cancer risk. There are some chemicals with the oral reference exposure level you could use with the breast milk pathway.

PANEL MEMBER FROINES: I didn't understand what you said.

ACTING CHAIRPERSON GLANTZ: Did you hear what John said?

John said, "I didn't understand the answer."

DR. BLAISDELL: Generally, with environmental exposures, you wouldn't worry about acute effects. It's the chronic effects like cancer and not long-term product non-cancer effects. You have an oral reference exposure level. If you had a drug or something that the woman was

taking, you know, you could end up with an acute poisoning. But not with environmental concentrations.

PANEL MEMBER NAZAROFF: So then I would only suggest I guess -- because it was really puzzling to me why we would be dividing by 70 years at that point, that qualifier be made more explicit that this is an approach that applies for environmental exposures when we're concerned about lifetime -- body burden or lifetime exposure leading to cancer -- an increased cancer risk or something like that.

DR. BLAISDELL: Okay. We can do that.

PANEL MEMBER FROINES: If a woman's exposed to a chemical that metabolizes by oxidation to a more toxic chemical, which could be acutely toxic, I think that's not irrelevant.

DR. BLAISDELL: Do you have an example, John?

PANEL MEMBER FROINES: No, I don't offhand, because I'm not sure. I mean, obviously organophosphate is an issue. But I don't -- I hadn't thought that through.

DR. BLAISDELL: They're not part of the Hot Spots Program.

PANEL MEMBER GILL: But actually, I do not think that is actually going to be a significant risk in terms of acute toxicity, because under the monitoring program

which is toxics from an environmental exposure, I think that acute toxicity would be relatively limited at all. And if it occurs, it will be under a different implementation rule rather than the air toxics responsibility.

PANEL MEMBER FROINES: I guess I agree with that. My concern was one that was raised earlier, which is about VOCs and Toluene and Xylene, which I wasn't -- I didn't come away with the feeling that it's been effectively addressed in the answer. It's not necessarily irrelevant is what I'm saying.

PANEL MEMBER NAZAROFF: I had one further point on this chapter, and that has to do with equation 5-2. Even within the space of how dermal exposure is handled in your document, you don't seem to include dermal exposure of the mother as a contributor to the breast milk contamination.

DR. BLAISDELL: If it's not in there, its omission was inadvertent.

PANEL MEMBER NAZAROFF: Okay. I've already criticized my thinking or expressed my critical thinking about how the dermal part is handled. But as a secondary sort of maybe more minor point, but equation 5-2 to be consistent here ought to include the dermal.

DR. BLAISDELL: Yes. We totally agree.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: It's stated on page 5-3 the minimum pathways that the nursing mother's exposed to include inhalation, soil ingestion and dermal --

PANEL MEMBER NAZAROFF: But it's not in the equation.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: It didn't get into the equation somehow.

PANEL MEMBER NAZAROFF: And it would show up I think absent also from equation 5-3.

DR. BLAISDELL: We'll make that correction.

PANEL MEMBER NAZAROFF: Okay. Those were my comments.

ACTING CHAIRPERSON GLANTZ: Anything else on this chapter? Okay.

PANEL MEMBER FROINES: I just was going to say I don't have any documents with me. So I don't have -- I'm at a loss. But I'll look back at the issue that Bill raised earlier about breast milk and get back to Melanie.

ACTING CHAIRPERSON GLANTZ: Okay. So Chapter 7 is food, home produced food. Anybody have any comments on that?

PANEL MEMBER FROINES: No.

ACTING CHAIRPERSON GLANTZ: No. Okay. Chapter 8 is water.

PANEL MEMBER GILL: This water consumption, I assume you're talking about water that is taken from open sources, not portable water.

DR. BLAISDELL: It's not municipal sources. It's --

ACTING CHAIRPERSON GLANTZ: Right.

DR. BLAISDELL: And we actually don't consider well water either because it's very hard to contaminate an aquifer when they start with air deposition.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Typical air deposition.

DR. BLAISDELL: Typical.

ACTING CHAIRPERSON GLANTZ: What is atypical air deposition?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Like some massive emergency releases of something awful that can get into the water.

ACTING CHAIRPERSON GLANTZ: Oh, okay. So any comments on water, Chapter 8? No. Okay.

How about fish, which is 9. Anything on that? Okay.

And then I think John will have something on this Chapter 11, the residential worker exposure duration evaluation of short-term projects and individual versus population risks.

As I said, the one thing I think I had mentioned earlier is I think the report needs to be more explicit about what people should be doing in this issue of handling massly exposed individuals who are point source versus some large number of people exposed in a population exposure. So I think it needs to be much clearer about when to use which approach. But that was my main comment on that.

And John, you had something you had mentioned to me earlier about an employment duration, was that it?

PANEL MEMBER FROINES: Well, I had something that I decided to let it go.

ACTING CHAIRPERSON GLANTZ: Okay.

PANEL MEMBER FROINES: But, wait. My point is I'm not saying with the 25-year duration. And I don't really have a good sense of the distribution that one might have to take into account. And so it's an issue which is unresolved for me. And since I don't have -- since I'm concerned about it, but don't have specific comments at this point, I'll follow up with Melanie.

ACTING CHAIRPERSON GLANTZ: Okay.

PANEL MEMBER GILL: I just want to follow up and you used eight-hour exposure time. And that is based on what criteria?

DR. BLAISDELL: Well, there's actually two

criteria. Some facilities only operate eight hours a day say five days a week. And we have eight-hour breathing rates for those situations.

The other situation, which could be applied could be the off-site worker, because the off-site worker's living in a facility emitting 24 hours a day is only there during the eight-hour workday. So it would be applied in those.

PANEL MEMBER GILL: That's why I'm asking eight hour work days is not eight hours. It's actually a nine hour workday.

DR. BLAISDELL: It can be adjusted in proportion if you want to account for the additional period of time.

PANEL MEMBER GILL: The lunch hour is usually spent at the facility, too, so that's why I'm asking.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: The districts can ask the facilities to use the appropriate duration of exposure in those instances. These are sort of a generic assumption of eight hours someplace, school or work or wherever.

ACTING CHAIRPERSON GLANTZ: But it may be that maybe you should change your generic assumption.

PANEL MEMBER GILL: If you have that assumption, I suggest you say this is based on that assumption and make a qualifying clause that if the work hour is slightly

different, then you have to adjust that estimate for that particulate work hour.

ACTING CHAIRPERSON GLANTZ: But it might actually -- since this is going to become the default for all practical purposes, it may well be that you should suggest using nine hours on the grounds that most people are at their work site more than the normal eight hours of working.

PANEL MEMBER FROINES: You have no way to look at distribution, do you?

DR. BLAISDELL: The data aren't there for that, John, as far as I know.

PANEL MEMBER FROINES: Because this whole issue of eight hours, you know, has been around since the dawn of time and especially since OSHA was formed. But it's not accurate. People work much different hours than eight hours or are exposed for more than eight hours. It's something that needs -- OSHA needs to address it. And perhaps not you, but it is an issue that -- the duration is an issue that is poorly dealt with I think.

DR. BLAISDELL: Okay. We can add some language that suggests accommodating different work schedules.

ACTING CHAIRPERSON GLANTZ: But you know, I actually think that the people have raised a good point here. And it may be that you should change it to nine in

the report. And then say -- I think you can add the language that when actually doing the risk assessments they could adjust it. But my guess is most people are at work for nine hours a day, because of lunch and breaks and such.

DR. BLAISDELL: Okay. We can do that.

ACTING CHAIRPERSON GLANTZ: It's evidenced by the fact we had a 45-minute break in our work schedule today, but we're in the same building for lunch. So I mean, I think that's a substantive change that would be a good idea in the report.

DR. BLAISDELL: Okay.

PANEL MEMBER FROINES: The question is -- I've worked in factories before. And we work, you know, large periods of time of overtime. But I would assume that Melanie would say if the workers are working twelve hours a day because of overtime, that that is something that the districts would address, rather than OEHHA.

DR. BLAISDELL: The district would have that call.

ACTING CHAIRPERSON GLANTZ: I think that's reasonable, John. But I think if you're taking a default, I think nine hours is a better default.

PANEL MEMBER FROINES: I'm just interested in the default. That's fine with me. I'm also interested in the

distribution.

ACTING CHAIRPERSON GLANTZ: But I think they've already agreed to put something about that. They don't have the distributional data. But to note that in doing the individual risk assessment if there is evidence that people are working longer work days, that should be put into the calculation.

PANEL MEMBER FROINES: That's fine.

ACTING CHAIRPERSON GLANTZ: Anything else on Chapter 11?

Melanie.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: I just want to say that after rereading it a few times, I realized it is a hodge-podge as Bill pointed out and it definitely needs to be reorganized. So we are going to make this a much nicer chapter for the next version.

PANEL MEMBER FROINES: Which chapter?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: This is Chapter 11, John. Basically, what we did was put a lot of concepts in there that didn't fit in anywhere else nicely in the other chapters. So we have a bunch of different things that are related, but it needs to be more laid out better and written a little bit clearer.

PANEL MEMBER FROINES: Good. Thank you.

ACTING CHAIRPERSON GLANTZ: So that takes us back to Chapter 2.

One other thing I'd just like to -- before we do Chapter 2, now there are -- half the document are appendices, and which I did look through. I have to say I didn't check every number in every one of the tables. But the appendices were tied to the earlier chapters. So I would, just assuming in a discussion, if anybody wanted to say anything about an appendix, they would have; is that okay?

PANEL MEMBER NAZAROFF: That's not what I was assuming. I have some comments on appendices.

ACTING CHAIRPERSON GLANTZ: Before we go to the dispersion modeling, which is kind of a different topic, let's deal with any other comments about the appendices, other than the dispersion modeling stuff.

PANEL MEMBER NAZAROFF: So I have comments on three of the appendices, E, F, and L.

E deals with -- it's called determination of chemical for multi-pathway analysis. But what it really focuses on is the air particle partitioning. And you know, I guess the first comment is that the Yuma model from 1977 is pretty well outdated at this point. There's been an enormous advance in our understanding of

especially the organics, semi-volatile organic partitioning between the particle phase and the gas phase that's taken place mainly in the last 15 years or so.

Yuma's model is based on the idea that the critical particle parameter is the particle surface area and that the species is adsorbing to that surface and partitioning.

But what appears to dominate in ordinary atmospheric environmental conditions is the organic condensed phase material into which other organics dissolve so it's an AB absorption phenomenon rather than an absorption phenomenon.

And I don't think you're probably off by large factors, but this chapter or the appendix should really be updated to reflect the current understanding of how SVOCs partition between the gas phase and the particle phase.

One of the key clues to me is the -- in the notes to you, I said that the references are long in the tooth, most of them are prior to 1995, which was for me kind of when the watershed happened and people really started understanding this process outdoors.

So anyway, I would commend to your attention kind of some of the latest literature in this area and think about reframing the partitioning as the SVOCs going into --

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Organics.

PANEL MEMBER NAZAROFF: Organics in the condensed phase, rather than sitting on surfaces.

On F, here we are with dermal again. Maybe I don't have any more points, but let me check to be sure.

No, actually, I do. Because this is your treatment of dermal, which again was soil gets contaminated. People get the soil on them. And then they get some dermal exposure.

So I had a couple comments I haven't made yet on that. First, I think you have done this reasonably, but I don't know the literature well enough to be sure. So I just want to call to your attention an article published by John Kissel in 2011 in Journal of Exposure Science and Epidemiology. It's called, "The Mismeasure of Dermal Absorption." And he takes a hard look at the sets of empirical studies in which contaminated soil is applied to skin. And then the fraction of the contaminant that's in the soil that gets through the skin is determined. And he makes the key point that if you make the soil layer thicker and thicker, that percentage goes down.

I saw that reflected in your appendix so maybe you've already captured the central ideas. But the literature citations were a bit old again so I just want

to have you take a look at Kissel's latest paper on this topic to make sure that his current understanding and your thinking about this in this document are consistent.

DR. BLAISDELL: We can do that.

PANEL MEMBER NAZAROFF: I had one other specific point, which had to do with -- shows up on page F-15. And it addressed kind of default parameter values. And I'm not sure -- I read this part kind of quickly, so I'm not sure I captured the key idea. So I'm going to parrot to you what I think the key idea was and what I'm concerned about about it and then you can correct my misunderstanding if it existed.

Basically what I got was that for organic compounds, kind of a default absorption coefficient would be ten percent. And for metals, a default absorption coefficient would be one percent. And you presented an argument that these numbers were kind of well within the range of what -- when you had specific data, what those specific data would show for those classes of compounds.

My concern comes up with the metals because the numbers that you present are in the range of .2 to 4 percent. If in the absence of data one were to pick one percent and say this is an appropriate default assumption, do you run the risk of being a factor of four away from a conservative position, which is what I think you ought to

be for the first screening level analysis in the absence of specific data pick a conservative number, not a number in the middle of the range. So my sense was from what was presented here that that default number ought to be four percent, not one percent.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: We'll go through the document and take another look at it. I think that's a hangover from the last version and we didn't actually think too hard about that.

DR. DODGE: Yeah, I think I only applied the one percent in a few cases where I didn't have very good data or very much. That was for selenium and for fluoride. And the data I had suggested those two chemicals really don't get across the skin very easily. And it's probably not four percent. At best, it's probably one percent, somewhere around this sort of default factor that was published some years ago when people first started looking at dermal absorption.

PANEL MEMBER NAZAROFF: That may be right. And I guess my point is just to go back and have another look at the way that that particular issue is handled to make sure that if you apply it in a screening sense in the absence of specific data, for example, for metal salts where you don't have an empirical basis to know what the absorption coefficient is.

DR. DODGE: Right. That's a good point. I think four percent would be too high for these particular chemicals. But yeah.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: We will re-evaluate and look at where we can apply it and see if that should have been a different number.

PANEL MEMBER NAZAROFF: And then my last comment that I want to raise is from Appendix L. And I haven't got my brain completely wrapped around this, but it seems to me the retrospective question -- how long have you lived in your current residence -- doesn't give an unbiased estimate of what you want for health risk.

I'm just thinking about my own case. I've lived in my house for 25 years. I'm in my 50s. I'll probably live there another 20 years before I reach the end game. And the right answer for me, if there was an exposure facility or some kind of industrial release facility ought to be 45 or 50 years, not 30 years, even though 30 years is pretty close to the answer I would give you for how long I've lived in this space.

So you're using empirical data on people's response to how long have you lived in your current residence as a basis to decide what's an appropriate duration of an exposure appraisal. And I'm just concerned that you're biased in the wrong direction. If I had to

stick my finger up in the air and give you a number to work with, I'd say if you're going from birth until adulthood, use 20 or 21 years or whatever. And then if you're talking about adults, you know, let's take -- again, if it's a screening or a point level estimate, let's take 50 years, the time between when you're first an adult and the sort of end of a normal life span.

PANEL MEMBER GILL: If I take a look at my neighborhood, for example, I think 30 years probably may be too high.

PANEL MEMBER BUCKPITT: My too.

PANEL MEMBER NAZAROFF: Well, if you live in a neighborhood that was recently built, it's definitely too high. That's another bias. If you ask the question in California now and do it across the state's population, because of the influx of people, there's many houses that didn't exist 50 years ago that exist today. So you can't get an answer that would be 50 years. And yet, in established neighborhoods where there are old houses, you can find people who have lived there quite a long time. And again, I didn't get my brain completely wrapped around this, but I wasn't really satisfied with the approach.

DR. BLAISDELL: You're absolutely right. The data that are used to estimate residential duration are not what we want. But they are what we have, both

nationally and the data in California. And what you really would like is longitudinal data on individuals. But we just don't have it. You can't get it from the census.

ACTING CHAIRPERSON GLANTZ: But I think he's making a little different point. That's if you ask people how long they lived at a given location, that's how long have they lived there as of today. That doesn't count the additional time that they're likely to live there. So you have sort of censored data.

DR. BLAISDELL: Absolutely.

ACTING CHAIRPERSON GLANTZ: So it may be that you ought to make some kind of adjustment to try to take into account the censory -- maybe you could cross link that with age distribution data or something.

But that's a good point. I mean, it is going to underestimate the time.

DR. BLAISDELL: There is no question that the data are --

ACTING CHAIRPERSON GLANTZ: So you ought to try to guesstimate some --

DR. BLAISDELL: We would absolutely -- based on what we've looked at, I think we would be pulling a number out of a hat.

One of the reasons why we kind of stuck with the

9, 30, and 70 is that those are consistent with what U.S. EPA has used. And you know, it's based on this absolutely imperfect survey questioning. I mean, somebody could have lived 50 years and moved last week to an old folks home, and the answer would be I've lived here two months. And actually the same thing applies to the worker data on the job.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: At the same time, you may have the same probability of asking somebody who's been in their house for 60 years and the answer is 60.

So we're aware that it is a problem, and I agree with you it's like really hard to get your head around, much less how to correct for that. But maybe a little more discussion is in order of that.

PANEL MEMBER NAZAROFF: It also seems like using an estimator that you know is biased because the data are available, that's not, to me, clearly superior than making a reasonable judgment based on kind of common sense often people rely on that in an exposure world as well. And you can justify the common sense argument maybe better than you can to correct for a biased estimator based on a question that is not giving you the answer that or the data that you need to do this in an unbiased fashion.

PANEL MEMBER FROINES: I also think one of the

goals of this is to improve our exposure assessment to affect public health protection and prevention. And I think that if we are going to have pro public health as a goal, then we have to think about what are the larger exposure estimates might suggest.

ACTING CHAIRPERSON GLANTZ: Well, I agree with that.

So let's go back to Chapter 2. I had just one kind of picky question, just to show people I read it. If you look on page 227 in the second line, you're talking about adjusting if a factor only operates five days a week out of seven. And you're saying apply a factor of seven over five. It seems to me it ought to be five over seven. Am I missing something? It's on page 227, the second line. Seemed like what we had there was backwards, but it may be I'm not understanding. What you're doing is adjusting if a factory doesn't operate every day.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: It's to multiply of the annual average. It's because the model has annualized.

DR. BLAISDELL: You're right. I'm sorry.

ACTING CHAIRPERSON GLANTZ: Those two numbers are upside down.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: We will check with that.

ACTING CHAIRPERSON GLANTZ: I just wanted to demonstrate for the record I did read this thing.

So anyway, anybody have any other comments about -- I have a bunch of little things in this chapter, but I'll just give them to you.

So did anybody else have any comments on Chapter 2. Either of you guys? You're the most chatty guy today.

PANEL MEMBER NAZAROFF: I'm sorry. I'm not sorry. I'm really proud that I'm the most chatty one.

ACTING CHAIRPERSON GLANTZ: You should be proud. We're going to give you an award.

PANEL MEMBER NAZAROFF: The gold star.

ACTING CHAIRPERSON GLANTZ: The gold star.

PANEL MEMBER NAZAROFF: There are two issues that I want to bring up on the meteorologic part of the system, the dispersion part. One has to do with calms and how those are handled. So I know -- and it's stated here that AERMOD, the recommended dispersion model now, doesn't incorporate calm conditions. And just for everybody's sort of background, the wind speeds measured at some meteorologic monitoring station, there is distribution by hour of the recorded values. But then there are some hours where the wind speed is below the minimum reporting level, half a meter per second or a meter per second, whatever the particular condition is. And in that case,

the answer is reported as calm.

And when you try to put that into a standard Gaussian plume dispersion model, you get an indeterminate answer because you divide by wind speed. So it's a fundamental problem in Gaussian modeling. The statement in here on page 228 is that U.S. EPA's policy is to disregard calms until such time as an appropriate analytical approach is available. That's probably okay for risk management and risk protection for elevated sources, because calm conditions are not going to produce extraordinarily high exposures when the source is emitting aloft.

But when you have ground level emission sources, those are the worst times. The calms actually have the highest associated local exposure impacts. And so again the kids who were in a school that's close to a roadway and the conditions -- if the conditions that are calm are not accounted for, then there will be a systematic bias in the exposure assessment. It's going to be tens of percent of impact.

Calm conditions, I've looked at these data for some other purposes occur about ten percent of the time. And the conditions that are just above calm contribute on average something like 30 percent of one's exposure for a ground level release event. So the calm conditions could

make a significant contribution.

There is a comment -- I mean, this statement on 228 concerns U.S. EPA's policy. What I couldn't tell for sure was what happens in this modeling protocol, 238 says that under regulatory options includes calms and missing data processing routines. But I don't know what that means, and the text didn't elaborate.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: We will talk with ARB about that.

But my understanding, which is, albeit limited, on this dispersion model are that the calms aren't completely ignored. They're set to the lowest threshold that would be defective. So half a meter per second or whatever it is. So it's kind of like, okay. We have all these calm hours. We'll just treat them as if they were at the threshold. But I could be wrong about that.

PANEL MEMBER NAZAROFF: Coincidentally, unrelated to my position on this Committee, we've been talking with U.S. EPA about their NATA assessment, National Air Toxic Assessment, particularly with respect to vehicle emissions, an area I'm currently interested in. And we had an e-mail exchange with them recently on exactly this point asking them how they handled the calm conditions for assessing population exposure to vehicle emissions in the NATA assessment. And the answer we got back was they were

ignored. They were censored out of the data that were analyzed. So what you got was the average for everything that was not calm. And a biased outcome as a result.

The one other point had to do with deposition, which shows up, of course, I guess mainly in the multi-pathway exposure assessment. And if I understand properly, any contribution of deposition to reducing airborne and inhalation exposure is neglected but then -- and I think that's fine. And then the deposition is necessary in order to account for soil contamination and other things of this sort.

So page 241, it says, "Deposition algorithms are unavailable in the initial release of AERMOD. U.S. EPA is developing deposition algorithms. Check with U.S. EPA for availability."

Is that current information?

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: I don't think so. That's another question for ARB.

DR. BLAISDELL: We'll talk to ARB about that. But however they deal with deposition, it wouldn't be ignored because it's really integral for our risk assessment model. They might use ISC. ISC is to estimate deposition or something like that. I don't know. But you're definitely right; it needs to be clarified.

PANEL MEMBER NAZAROFF: Those are my comments.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: I still think it's the case that they don't look at the depletion of the plume. So there is a little bit of double counting.

PANEL MEMBER NAZAROFF: Right, which probably is a small enough issue if one is aiming to be health protective to not be concerned about, because deposition in the near field isn't going to be a major loss mechanism for the air concentrations for the things we're concerned about.

AIR TOXICOLOGY AND EPIDEMIOLOGY BRANCH CHIEF MARTY: Unless they're sending rocks out to stack.

PANEL MEMBER NAZAROFF: That's right. No gravel intake exposure would be accurate without accounting for deposition.

ACTING CHAIRPERSON GLANTZ: Any chapters on Chapter 2? Any other comments on anything? I think we've worked our way through the report.

Well, so here's what I would suggest. I mean, I think the discussion -- notwithstanding, I think the document's actually in pretty good shape. I think there have been a few substantive issues raised that I think you need to deal with. But most of the criticism has been about the presentation I think. And I would hope that we

would be able to act on this report at the next meeting.

Now, there are a couple of very experienced people who often have opinions who aren't here today. And so what I would ask the OEHHA to do is to reach out to Paul Blanc and Kathy Hammond. And I'm blanking on who else isn't here.

PANEL MEMBER FROINES: Jesús, Beate Ritz.

ACTING CHAIRPERSON GLANTZ: Yeah. And just try to work with them on the phone and get any additional comments that they have so that hopefully when the report comes back next time, we can approve it. Obviously, it's going to be a next draft circulated to people. But I'd hate to have to have this drag on for another meeting if we can avoid it.

So the next item on the agenda is consideration of request to have oral testimony at the meetings. And again, we have kind of a light turnout this time, unusually light actually. So I don't want to make any decisions on this. This is an issue since I've been on this Committee like almost as long as John has, this is an issue that comes up from time to time. The Committee in the past has been of the view that we didn't want to take oral testimony because the issues before us are quite technical and the feeling was that having the material submitted in advance of writing gave people a chance to

look at it and think about it. That certainly has been my personal view. But I think if anybody wants to express --

PANEL MEMBER FROINES: Let's leave it for next time.

ACTING CHAIRPERSON GLANTZ: Okay. I think we should leave it for next time. In deference to our real chair. But so is that okay, Jim?

MR. BEHRMANN: Yes.

ACTING CHAIRPERSON GLANTZ: But do think about it and we'll talk about it next time.

That's all the business I know of. Does anybody else have any consideration of administrative matters?

So do we need a motion to adjourn or can we just -- somebody move --

PANEL MEMBER GILL: So moved.

PANEL MEMBER FROINES: You need a motion.

ACTING CHAIRPERSON GLANTZ: You move.

PANEL MEMBER GILL: I move you adjourn the meeting.

PANEL MEMBER BUCKPITT: Second.

ACTING CHAIRPERSON GLANTZ: Any opposition? Okay. Well, thank you all. This was a big report and I think you guys made a lot of good comments.

(Whereupon the ARB Scientific Review Panel adjourning at 2:44 p.m.)

CERTIFICATE OF REPORTER

I, TIFFANY C. KRAFT, 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 hearing was reported in shorthand by me, Tiffany C. Kraft, 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 hearing nor in any way interested in the outcome of said hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 18th day of April, 2012.

TIFFANY C. KRAFT, CSR, RPR
Certified Shorthand Reporter
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