MEETING

STATE OF CALIFORNIA

ENVIRONMENTAL PROTECTION AGENCY

AIR RESOURCES BOARD

SCIENTIFIC REVIEW PANEL

ON TOXIC AIR CONTAMINANTS

ZOOM PLATFORM

FRIDAY, JUNE 16, 2023

9:31 A.M.

JAMES F. PETERS, CSR
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APPEARANCES

PANEL MEMBERS:

Cort Anastasio, PhD, Chairperson

Ahmad Besaratinia, PhD

Paul Blanc, MD

S. Katharine Hammond, PhD

Joseph R. Landolph, Jr., PhD

Karen Messer, PhD

Beate R. Ritz, MD, PhD, MPH

REPRESENTING THE AIR RESOURCES BOARD:

Arash Mohegh, PhD, Health and Ecosystems Assessment Section, Health and Exposure Assessment Branch, Research Division

Brian Moore, PhD, Manager, Community Planning Section, Community Planning Branch, Office of Community Air Protection

REPRESENTING THE OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT:

Vince Cogliano, PhD, Deputy Director, Division of Scientific Programs

Heather Bolstad, PhD, Air and Climate Epidemiology Section, Community and Environmental Epidemiology Research Branch

Daryn Dodge, PhD, Air Toxicology and Risk Assessment Section, Air and Site Assessment and Climate Indicators Branch, Division of Scientific Programs

Kannan Krishnan, PhD, Chief, Air and Site Assessment and Climate Indicators Branch, Division of Scientific Programs

APPEARANCES CONTINUED

REPRESENTING THE OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT:

Moira Sullivan, MS, Air Toxicology and Risk Assessment Section, Air and Site Assessment and Climate Indicators Branch, Division of Scientific Programs

ALSO PRESENT:

Linus Farias, California Council for Environmental and Economic Balance

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PROCEEDINGS

CHAIRPERSON ANASTASIO: Okay. Good morning, everyone. Welcome to the meeting of the Scientific Review Panel. We have several items on today's agenda that we'll talk about in a minute. First, I'd like to welcome everyone to the webcast and the meeting will be recorded. Arash, I assume you're going to take care of that.

(Thereupon a slide presentation).

CHAIRPERSON ANASTASIO: We're going to start with Panel introductions. So I'm pleased to welcome our newest member, Dr. Pamela Lein from UC Davis who's the pathologist representative on the panel. Unfortunately, she's sick today, so won't be able to join us.

I'm also happy to say that I have been reappointed as the atmospheric science representative and chair of the Panel. So it's nice to be back. And then finally, Ahmad Besaratinia has also been reappointed as the oncologist representative to the Panel. So Ahmad, thank you for your continued service.

I'm going to go around and I'll just have each panel member briefly introduce themselves.

Beate, do you want to start.

PANEL MEMBER RITZ: Yes. So I'm Beate Ritz professor of epidemiology and environmental health from the Fielding School of Public Health at UCLA. And I do a

lot of research on air pollution and health outcomes as well as pesticides and health outcomes in the state of California.

CHAIRPERSON ANASTASIO: Thank you, Beate.

Paul.

PANEL MEMBER BLANC: I'm Paul Blanc. I'm professor of medicine at the University of California San Francisco and Chief of the Division of Occupational and Environmental Climate Medicine there. And my research focuses on -- largely on occupational inhalation exposures.

CHAIRPERSON ANASTASIO: Thank you, Paul.

Karen.

PANEL MEMBER MESSER: Yes. Good morning. I'm Karen Messer from UC San Diego. I'm a professor of biostatistics in the Herbert Wertheim School of Public Health. I'm the Director of Biostatistics at Moores UCSD Cancer Center. And I have a lot of expertise in causal inference. So in methods of assessing for and correcting for bias that can arise in observational data.

CHAIRPERSON ANASTASIO: Thank you, Karen.

Ahmad, do you want to give yourself a fuller introduction than what I did.

PANEL MEMBER BESARATINIA: Thank you, Cort. Happy to be reappointed and continue to work and on

this -- serve on this very important panel. I'm Ahmad Besaratinia. I'm a professor at the Department of Population and Public Health Sciences at University of Southern California here in Los Angeles. I'm a cancer biologist and my background is in nuclear epidemiology, genetic toxicology, and public health.

CHAIRPERSON ANASTASIO: Thank you, Ahmad.

Kathy.

PANEL MEMBER HAMMOND: I'm Katharine Hammond from the University of California, Berkeley, School of Public Health. And I'm a Professor Emerita. My research is in occupational and environmental health. I've done a lot of work in the Central Valley, especially around Fresno and air pollution and children's health, and occupationally studied the various effects of the work environment on workers in the light metals industry, and automobile manufacturing, automobile repair, semiconductor industry, the railroads and diesel exhaust, which was my first encounter of the Science Review Panel. And I'm happy to be here and good morning to everybody.

CHAIRPERSON ANASTASIO: Thank you, Kathy. I didn't realize you had retired. When did that happen?

PANEL MEMBER HAMMOND: Yeah. July 1st, that's on the books. But the people who know me say it's hard to tell.

(Laughter).

CHAIRPERSON ANASTASIO: Well, congratulations.

PANEL MEMBER HAMMOND: Thank you.

CHAIRPERSON ANASTASIO: All right. Joe.

PANEL MEMBER LANDOLPH: Hi. Good morning. I'm Joe Landolph. I work at the University of Southern California. There I'm a member with tenure of the Department of Molecular Microbiology and Immunology, and Department of Pathology. And I'm a member of the USC Norris Comprehensive Cancer Center. My training and work has been in the area of chemical toxicity and chemical carcinogenesis. We've specialized in working early in my career polycyclic hydrocarbons.

And now we're working on nickel, arsenic, and chromium. And we've just shown that nickel is mutagenic contrary to what people would have thought. So it's a mixed agent and it does things by epigenetic mechanisms as Max Costa has shown and also by genotoxic mechanisms as we have shown and continue to work on. And it causes amplification of genes, deletion of genes, and many base substitution mutations.

And I serve on this Panel and also for the Carcinogen Identification Committee panel reporting to OEHHA.

CHAIRPERSON ANASTASIO: Great. Thanks very much,

Joe.

And I'm Cort Anastasio. I'm a professor at UC Davis and an atmospheric chemist and the Chair of the Panel.

Okay. If we could go to the next slide, Arash.

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CHAIRPERSON ANASTASIO: We have five items on the agenda today. First, we're going to be talking about the new reference exposure level document for trimethylbenzenes. Then we're going to go to a -- an update or a correction for the cancer inhalation unit risk factor for cobalt sulfate, which we -- there was a cancer inhalation unit risk factor document that we examined I think it was 2019. So we're going to look at an update to that.

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CHAIRPERSON ANASTASIO: We'll then have an informational item on how to speed up the development of health guidance values. We'll then move to an informational item on a recent release of the draft updated cancer inhalation unit risk factor ethylene oxide. And then Brian is going to give us an informational update on the Community Air Protection Program. And then that will be the bulk of the meeting and we'll just have a few minor items at the end of that.

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CHAIRPERSON ANASTASIO: Okay. For any of the items, you can submit written comments. And to do that, the -- Arash has the link up here and the QR code, so you can submit written comments through either of those two methods. And then for the final item on our agenda the community air protection item, we will be taking oral public comments for that and we'll have instructions about how to do that when we get to that item. So that will be our last item and we'll take public comments on that -- oral comments at the end.

Okay. We're going to move now then to our first major item which is the trimethylbenzene REL. So Office of Environmental Health Hazard Assessment, OEHHA, staff will present a draft document that summarizes the development of non-cancer acute 8-hour and chronic inhalation RELS for trimethylbenzenes or TMBs. To remind you, RELs are airborne concentrations of a chemical that are not anticipated to result in adverse non-cancer health effects for specified exposure durations in the general population, including sensitive subpopulations.

OEHHA is required to develop guidelines for conducting health risk assessments under the Air Toxics Hot Spots Program, which is Health and Safety Code section 44360(b)(2). And in response to the statutory

requirement, OEHHA developed draft RELs for TMBs, which were posted on January 27th, 2023, which started a 45-day public review period during which two public workshops were held. And there were no public comments received during the public comment period.

So I'm now happy to introduce Moira Sullivan, who's a toxicologist just from OEHHA's Air and Toxicology Risk Assessment Section for her to give us the TMB REL presentation.

Thank you, Moira.

(Thereupon a slide presentation).

MS. SULLIVAN: Thank you, Cort. Good morning, all. I'm going to share my screen here.

Can everybody see this yet?

Can everyone see that?

CHAIRPERSON ANASTASIO: Not yet.

PANEL MEMBER LANDOLPH: No.

MS. SULLIVAN: That's not good. Let me escape. Hang on one second.

I'll try this again.

For some reason, it's not showing up. That's what I was afraid of.

Cort, it's not showing up for some reason now. It did on the test, so...

CHAIRPERSON ANASTASIO: Does someone else have

your slides?

MS. SULLIVAN: Yeah. Yes. Yes, they do, but let me figure out why this isn't working.

CHAIRPERSON ANASTASIO: Oh, wait. I see Arash has started to share.

MS. SULLIVAN: Thanks, Arash. I'm having trouble with this again.

DR. MOHEGH: No problem. Is it -- does it look good?

CHAIRPERSON ANASTASIO: Yeah, it looks good.

MS. SULLIVAN: It does. It does. Thank you.

Okay. Good morning, all. My name is Moira Sullivan. I'm a toxicologist in Kannan Krishnan's section. And I'll be presenting this morning on the trimethylbenzene reference exposure level technical support document for the derivation of cancer RELs. So let me just dive right in here.

Next slide, please.

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MS. SULLIVAN: Trimethylbenzenes exist in three isomeric forms, in the 1,2,3-, 1,2,4-, and 1,3,5-trimethylbenzene.

Next slide, please.

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MS. SULLIVAN: The molecular formula is C9H12.

These are volatile aromatic hydrocarbons. They're clear colorless liquids at room temperature nearly insoluble in water. They have low vapor pressures and high boiling points.

Next slide, please.

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MS. SULLIVAN: TMBs occur naturally in petroleum deposits and are common components of petroleum refinery distillation fractions such as white spirit, high flash point naphtha, and gasoline. They're also emitted by steel-making facilities and coal-fired plants. Other emission sources include construction, cement, paving mixtures, asphalt, and metal coatings. TMBs are found in printing inks, paint solvents, hydraulic fracturing fluids, and as pesticide additives. And all three of the TMB isomers are found as constituents of biogas. And the source for that are municipal landfills.

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MS. SULLIVAN: Trimethylbenzenes aggregated and the 1,2,4-TMB stationary point source emissions are reportable to the California Air Resources Board under the Hot Spots Program for 2020, which is the latest year for which we have data, approximately 1,141 pounds of trimethylbenzenes from 34 facilities were reported, and

55,000 pounds of 1,2,4-TMB from 485 facilities. This does not necessarily representative every source of TMB emissions in the State, only those applicable to AB 2588, which is the Hot Spots Information and Assessment Act.

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MS. SULLIVAN: In humans, TMBs are readily absorbed via inhalation and have high respiratory uptake. Based on their blood air and oil air partition coefficients accumulation in adipose tissue is expected. In both animals and humans the three TMB isomers demonstrate similar metabolic profiles. Currently, it's not known which cytochrome P450 isozyme is most responsible for TMB metabolism.

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MS. SULLIVAN: All three TMB isomers metabolize primarily to dimethylbenzoic and hippuric acids. In humans exhalation of the unchanged parent compound is an important route of elimination. Urinary excretion of unchanged TMBs is very low. In human toxicokinetic studies, following a 4-hour exposure to 25 part per million 1,3,5, the majority of the absorbed dose was excreted in the first 50 hours post-exposure. However, urinary levels of metabolites were still detected 160 hours post-exposure.

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MS. SULLIVAN: There's a paucity of viable data for an acute REFERENCE exposure level. Human exposure studies consist of -- only of chamber studies, largely conducted in healthy adults males, that evaluated sensory irritation, 25 part per million for up to four hours. No evidence of respiratory irritation, CNS toxicity, or toxicity was found in these human exposure studies. The data were self-reported. Effects on the nervous system are seen in acute animal studies and these form the basis of the acute TMB REL.

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MS. SULLIVAN: So acute exposure to TMBs causes primarily respiratory and neurotoxic effects in animals. And the exposure duration in most of these studies was four to six hours. There is one animal inhalation developmental study with exposure uniquely to TMBs that found significant decreases of maternal body weight and food consumption at concentrations of 300 and 600 part per million 1,3,5- and 1,2,4- respectively. Significant dose-dependent decreases were also seen in fetal body weights at 600 hundred and 900 part per million 1,2,4-, and at 600 and 1,2000 part per million 1,3,5-.

The Saillenfait et al. developmental study was not however used for the acute REL, because neurotoxicity proved to be a more sensitive endpoint and Saillenfait did

not evaluate neurological or behavioral endpoints in their studies.

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MS. SULLIVAN: So the McKee et al. neurobehavioral inhalation rat study was what was chosen and -- for the acute REL. It was conducted on three consecutive days up to eight hours a day. Rats were exposed to 0, 125, 1,250, or 5,000 milligrams per cubic meter of 1,2,4-TMB. And they were tested after each exposure. Significant increases or latencies were seen in a number of neurobehavioral tests after a single 8-hour exposure to 5,000 milligrams per cubic meter. Significant can latencies have been observed in a number of other acute animal studies following exposure to TMBs.

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MS. SULLIVAN: So this slide shows you the Saillenfait -- this slide shows you the dose response data for the -- following a single 8-hour inhalation exposure. And you can see it's concentration dependent. And this is for latency greater than six seconds.

Next slide, please.

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MS. SULLIVAN: And here is the graphical output from the benchmark dose program showing concentration on the X axis and pain response or latency greater than

its -- I'm sorry, this is the pain response. It's the next -- that's the chronic REL. Latency greater than six seconds, which is visual discrimination on the Y axis.

Next slide, please.

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MS. SULLIVAN: So the acute REL is intended to protect against infrequent 1-hour exposures. The benchmark concentration is one standard deviation change from the control mean. The lower 95 percent confidence limit on the benchmark concentration, one standard deviation from the control mean is the BMCL, 1 SD. So the point of departure is calculated at 709 milligrams per cubic meter. This was adjusted from the 8-hour exposure in the study to a 1-hour exposure. That gives us 1,417 milligrams per cubic meter. Then a human equivalent concentration adjustment was applied, and that accounts for differences in blood and air concentration in rats versus humans. And in this case, the regional gas dose ratio was used to derive the human equivalent concentration for systemic effects.

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MS. SULLIVAN: The interspecies uncertainty factor as a total of six. There was a toxicokinetic uncertainty factor of 2 and that's from the technical

support document for OEHHA when you're using a HEC adjustment. The toxicodynamic factor was square root of 10 and that was due to the lack of toxicodynamic data on the interspecies differences.

Next slide.

Whoops, we lost that.

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MS. SULLIVAN: Great. Next slide, please.

So the intraspecies uncertainty factor was a total of 100. The toxicokinetic uncertainty factor was 10, because there's no information on pharmacokinetic differences for TMBs among adults, infants, and children. And the toxicodynamic uncertainty factor is 10, because TMBs are neurotoxicants and children are potentially more sensitive than adults. So that's a cumulative uncertainty factor of 600. And the final value for the acute TMB REL is 2,400 micrograms per cubic meter, or 490 part per billion.

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MS. SULLIVAN: Okay. So moving on to chronic subchronic effects. There were no controlled -- human controlled chronic or subchronic studies or any child-specific toxicity data that was identified in the literature. No occupational exposure studies that had

exposure uniquely to TMBs. Occupational studies in workers that are exposed to paint thinners that can contain as much as 80 percent TMBs do report central nervous system effects including neuropsychological changes, memory deficits, reduced motor speed/coordination, as well as anemia and bronchitis. And in biomonitoring studies of factor workers exposed to solvents containing TMBs, vestibular disorders have also been reported.

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MS. SULLIVAN: So for the animal data, there are no lifetime chronic animal studies for any of the three TMBs isomers. Subchronic animal studies show largely respiratory and neurological effects. Subchronic inhalation studies in rodents also show organ effects in liver and kidney, hematological, and clinical chemistry effects. The most sensitive endpoint is neurotoxicity.

Thank you.

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MS. SULLIVAN: So the derivation for the chronic reference exposure level that use the Korsak and Rydzynski neurotoxic inhalation study, and the concentration -- this -- in the study, concentration-dependent disturbances and pain sensitivity in motor behaviors were seen in male

rats following a 6-hour per day, 5-day per day -- per week, 3-month exposure to 0, 25, 100, or 250 part per million TMBs. Significant effects on pain sensitivity were seen at equal to or greater than 25 part per million 1,2,3-, and greater than or equal to 100 part per million 1,2,4-TMB. Significant effects on rotarod performance, which measure neuromuscular function were also seen at greater than or equal to 100 part per million and at 250. Separately, 1,3,5-TMB has also been found to result in behavioral disturbances in a related study by the same authors.

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MS. SULLIVAN: Okay. So the chronic REL derivation, here it shows the data sets that we used to develop the REL. And you could see there's the 1,2,4- and the 1,2,3-TMB isomer, and that the animals were more sensitive to the 1,2,3- at 25 part per million than they were to the 1,2,4-.

Next slide, please.

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MS. SULLIVAN: And here's the graph showing the concentration on the X axis and the pain response, the paw-lick latency on the Y axis. And you can see the graphical output from the benchmark dose program.

Next slide, please.

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MS. SULLIVAN: The 1,2,3-TMB isomer yields the lowest point of departure. The benchmark concentration again is one standard deviation change from the control mean, which is 86 milligrams per cubic meter. The lower 95 percent confidence limit brings it down to 47 milligrams per cubic meter. So that's the point of departure. This 6-day -- hour per day, 5-day per week exposure was adjusted for a continuous 24-hour exposure, which gave an adjusted BMCL one standard deviation of 8. And then the human equivalent concentration was Calculated for systemic effects.

Next slide, please.

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MS. SULLIVAN: So the chronic REL is intended to protect over a lifetime including sensitive subpopulations. A subchronic uncertainty factor was added, which is the square root of 10, because the 13-week study is less than 12 percent of a rodent's lifetime. The interspecies uncertainty factor was 6. Again, because the HEC adjustment was used the toxicokinetic uncertainty factor was 2 and the toxicodynamic uncertainty factor was the square root of 10 for lack of toxicodynamic data.

Next slide.

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MS. SULLIVAN: The intraspecies uncertainty factor was 100, again 10 for toxicokinetic and 10 for toxicodynamic due to know information on pharmacokinetic differences and because TMBs again are neurotoxicants in children are potentially more sensitive. So the cumulative uncertainty factor in this case was 2,000 and that led to a chronic TMB REL of 4 micrograms per cubic meter.

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MS. SULLIVAN: The 8-hour REL derivation is based on the same animal study as the chronic REL. It uses the same point of departure, which is 47 milligrams per cubic meter of 1,2,3-TMB. And the only difference is the time adjustment. It's adjusted for an 8-hour workday and to represent the breathing rate of workers. All the uncertainty factors are the same as we found in the chronic REL. And the 8-hour TMB REL is 8 micrograms per cubic meter.

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MS. SULLIVAN: So, in summary, these are the values for the TMB reference exposure level, acute, chronic, and 8-hour, 2,400, 4 micrograms and 8.

Next slide, please.

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MS. SULLIVAN: There was a public comment period for six weeks from January 27th to March 13th. And public workshops were held both in Southern and Northern California, and we did not receive any public comments on the draft TMB REL document. And this concludes my presentation. Thank you for listening.

CHAIRPERSON ANASTASIO: Thank you very much, Moira. So we have two panel leads for this item. Joe Landolph and then Pam Lein. Unfortunately, Pam is sick today, so she won't be joining us, but Joe is here fortunately.

So Joe, we'd like to start with you, please.

PANEL MEMBER LANDOLPH: Yes. First off, I wanted to congratulate Moira for doing such a thorough job, and Lauren Zeise, and the reviewers Daryn Dodge and John Budroe. The document pretty polished and that's because you have talented and very experienced authors and reviewers contributing to this document.

And the preface was great. It was appropriately short at half a page and it covered everything OEHHA is required to use to develop the guidelines. The summaries summarized all the reference exposure levels for the three TMBs. And it indicates the uses of TMB. It has commercial usage for service coatings, paintings, printing

inks, cleaning fluids and hydraulic fracturing fluids. They're a component of petroleum refinery distillation fractions, such as gasoline, high flash points naphthas, and white spirit. They're also emitted by steel mining facilities and coal-fired power plants. And they're found as constituents of biogas, as Moira mentioned.

It's a great summary of the uses and occurrence of the TMB. The summary of the toxicology of the TMBs is also very good. Moira noted that exposure to TMBs causes adverse effects on the respiratory, hematologic, and CNS systems in animals and humans. This causes acute toxicity, including CNS effects and respiratory irritation.

The authors note that chronic effects include neuromuscular, pulmonary, hematologic, and other organ and tissue toxicity. And the author further noted that there were effects on the nervous system in acute animal studies and this forms the basis of the acute TMB RELs. It was a nice table on the physical properties, which I -- physical and chemical properties, which I always liked to see.

Occurrence and major uses. The author, Moira, covered these on these three TMBs very well in this section, and very concisely, which is appropriate, because it's a lot of data. The toxicokinetics was interesting, The 3 TMB isomers were metabolized in similar ways with

some differences. As they pointed -- Moira pointed out, we don't yet know the exact cytochrome P450 enzyme that does this. It's possible it's 2E1, which metabolizes benzene, but that's not been nailed down yet.

All three TMBs are metabolized by side-chain oxidation to alcohols and their aromatic carboxylic/mercapturic acid by hydroxylation that form phenols and are excreted glucuronides and sulfate esters. I'm going to skip some of this for time.

The toxicokinetic studies in humans were covered pretty thoroughly, by Moira. High respiratory uptake and accumulation of TMBs in adipose tissue is expected. The partition coefficients of blood and air -- water and air, and oil and air are -- were presented in Table 5. And a study of Japanese workers indicated that there was TLV of 25 parts per million. And I'm not going to spend too much time on that.

The toxicokinetic studies in animals were also done. They've been studied by inhalation and by oral routes. And the author notes that the TMBs cross the blood-brain barrier following inhalation exposure in rats. And this is probably why you're getting neurotoxic symptoms as well. And there are slight -- some marked differences, the author points out, and the kinetics noted between the isomers of TMB, but I'm not going to dwell on

that for time.

The acute toxicity of trimethylbenzene was covered. And the statement was that there was little or no toxicity in studies in human subjects. Acute toxicity to infants and children. No TMB toxicity studies were found specifically to infants and/or children. Acute toxicity in animals. Most of the acute TMB studies in animals are inhalation according to the author of the document. Also, a few oral studies, acute exposure TMB causes primarily respiratory and neurotoxic effects. Some effects in toxicity, some differences in toxicity among a the three TMB isomers, but they're not huge or anything like that.

Parameters affected in treated animals include creatinine kinase, increased blood urea nitrogen decreased, and albumin decreased in male rats. Treatment-related effects included increased white blood cell counts with increases in neutrophils and lymphocytes, statistically significant increases in relative and absolute liver weights, and relative adrenal weights.

Morality studies. The acute 4-hour inhalation LC50 values of 18,000 milligrams per cubic meter, which is 3,663 parts per million and 24,000 milligrams per cubic meter, which is 4,882 ppm were observed.

Chronic toxicity. There's not much information

on the chronic toxic effects of TMBs in humans overall. Neither human control studies nor child-specific toxicity data in the TMB scientific literature. Occupational studies, as Moira pointed out, suffer from lack of good exposure data and are confounded by exposure to multiple organic solvents. From German studies translated into English, CNS effects, including nervousness, anxiety, tension, anemia, and bronchitis were found in male workers exposed to several years to a paint thinner containing more than 50 percent 1,2,4-TMB, 30 percent 1,3,5-TMB, and a trace of 1,2,3-TMB.

Chronic effects of children. OEHHA couldn't locate any scientifically adequate subchronic or chronic TMB toxicities studies pertaining specifically to infants children.

Chronic toxicity to animals. No chronic animal toxicities were identified for any of the three TMB isomers. Table 13 provides -- nicely summarizes the adverse effects reported in subchronic TMB toxicity studies in animals.

Derivation of the reference exposure levels look straightforward. And these were done conscientiously and Intelligently by Moira and a check by the reviewers. And I agree with all calculations there. I didn't see anything I disagreed with.

And the trimethylbenzene chronic reference exposure levels. The same thing, I agree with the calculations there. They're laid out pretty clearly. And I don't have anything to argue with about those. I accept all three of the calculations that they made. They look pretty similar to me, pretty conventional.

So I would congratulate Moira and the reviewers, and Chief, Lauren Zeise, for all the hard work that went into this document, writing it by Moira and reviewing it by Daryn Dodge and John Budroe. And I think it's a very good document. I'm fairly happy with it. Ordinarily most things that cross my desk get some red on it. As a professor, that's kind of reflexive, but I didn't see too much to argue with about this one. I was pretty happy with the product.

Thank you.

CHAIRPERSON ANASTASIO: Great. Thank you very much, Joe.

Sorry, Moira, did you want to say anything?

MS. SULLIVAN: Thank you very kindly, Dr. Landolph.

PANEL MEMBER LANDOLPH: My pleasure. Good product.

CHAIRPERSON ANASTASIO: Yeah. So I'm going to just go around now to the panel members one by one in the

order on my screen for any comments that people have.

Beate, I'll start with you.

PANEL MEMBER RITZ: Sorry. I had to find the button. I actually don't really have anything to add, except that I really enjoyed reading this document and that it's a little worrisome that it seems the facilities over time have been increasing who are putting this out there into the air. And it is a little worrisome that so many consumer proximity substances are actually contaminated with it. So very well done. Thank you.

MS. SULLIVAN: Thank you kindly.

CHAIRPERSON ANASTASIO: Thank you, Beate.

Paul.

PANEL MEMBER BLANC: Well, my first question is really for you, Cort. Will the Panel be receiving the written comments of the other lead who is not here today?

CHAIRPERSON ANASTASIO: I've asked Pam to email me the comments and I can definitely send that out to the entire panel, sure.

PANEL MEMBER BLANC: Because I don't remember experiencing before a document discussed where the other lead was not available at all to provided their input --

CHAIRPERSON ANASTASIO: Right.

PANEL MEMBER BLANC: -- so we have to rely on the lead.

So now my next technical question is do we have the PDF of the document itself, in addition to the slides available for reference to questions that I or the other Panel members may have? Is there a technical support person who has easily available?

CHAIRPERSON ANASTASIO: Sorry, Paul. Are you asking if Arash has the PDF of the document?

PANEL MEMBER BLANC: Right, in a form that he can screen share as needed.

CHAIRPERSON ANASTASIO: Arash, do you have that available? If not, I do.

DR. MOHEGH: I do, but not available right now, so if you can share that, that would be great, Cort.

CHAIRPERSON ANASTASIO: Sure.

PANEL MEMBER BLANC: So, Moira, one question from -- and these are going to come from my memory as I'm going through it. But the diagram that showed diagrammatically the chemical structures of the isomers, I just want to be sure that you're -- that you're following convention, because it seems not to be consistent in terms of where the positions are starting with 1, 2, and 3 or 1, 3, and 4 or the symmetric. The symmetric makes sense to me. And -- oh, there was -- one of them was out of place in terms of the orientation of the figure, but I put -- there could be a convention that I don't understand.

MS. SULLIVAN: I will certainly check that. Thank you.

PANEL MEMBER BLANC: If you know what I mean.

MS. SULLIVAN: I do.

PANEL MEMBER BLANC: I mean, if you could show it to the group, it will be clear what I'm asking about.

MS. SULLIVAN: I do. It looks like it's on page -- it's 1 -- line 172, Table 1.

CHAIRPERSON ANASTASIO: 172, got it.

PANEL MEMBER BLANC: Can you show that, Cort?

CHAIRPERSON ANASTASIO: Yeah, give me a second here.

MS. SULLIVAN: It's actually page 1 -- yeah. So I see what you're saying.

PANEL MEMBER BLANC: Yeah, it doesn't make sense to me.

MS. SULLIVAN: That the orientation isn't correct on the -- on the way it's put in to it?

PANEL MEMBER BLANC: On the -- yes, it has to be either the first or the second row. It doesn't make sense how that can be 1,2,3- and 1,2,4- because the two position is not the same.

MS. SULLIVAN: Got it.

PANEL MEMBER BLANC: Okay. And then on the -- I was also confused by the table that had the hot spot

releases, which had one listing for total trimethylbenzene and then for one of the isomers.

MS. SULLIVAN: Okay. And what specifically was confusing?

PANEL MEMBER BLANC: Confused me, is that the totals for the -- the values -- the weights for the total were less than the weights for the one isomer, for the 1,2,4- isomer.

MS. SULLIVAN: Right. So this has actually come up with our in-house reviewers as well. And we did reach out to the California Air Resources Board in regards to this, and --

PANEL MEMBER BLANC: And?

MS. SULLIVAN: Yeah. And it's not entirely clear. It's not a mistake. It just has to do something with the reporting.

PANEL MEMBER BLANC: Well, I would clarify that then --

MS. SULLIVAN: Sure.

PANEL MEMBER BLANC: -- because if your people were confused by this and I was confused by this, right?

MS. SULLIVAN: Yes. Let me make a note of this.

PANEL MEMBER BLANC: I actually maybe wonder if it's in thousands of pounds on one and just in pounds on the other, but --

MS. SULLIVAN: Right.

PANEL MEMBER BLANC: -- but it can't possibly be less, you know, for the total.

MS. SULLIVAN: And so let's just look at this. So are you on Table 3a or 3b? Which one are you --

PANEL MEMBER BLANC: Well, 3b shows values which are -- which are higher than 3a, unless I'm reading it wrong. Well, maybe -- no, maybe not. I don't know. Yeah, the net 55 -- like the last row is net 55,839 --

MS. SULLIVAN: Right.

PANEL MEMBER BLANC: -- for the isomer and only 1,41 for all combined.

MS. SULLIVAN: Yeah.

PANEL MEMBER BLANC: How is that possible?

MS. SULLIVAN: I think it's just the way it's reported. So they either report it as TMBs or they report the 1,2,4- isomer separately. And the aggregated TMBs are not exclusive to 1,2,4-, but they can include 1,2,4- or they cannot include 1,2,4-.

PANEL MEMBER BLANC: And then do they not report for the other three -- other two, I'm sorry?

MS. SULLIVAN: No, they do not. No. The program --

PANEL MEMBER BLANC: Well --

MS. SULLIVAN: -- only requires emissions

reporting either aggregated or for the 1,2,4- isomer specifically.

PANEL MEMBER BLANC: Then this is very, very misleading and I would either eliminate Table 3a and say you don't have good data for total, or, you know, reverse them in order and say these data are not reliable, because we don't know what they mean or -- or however you want to handle it, but I don't think --

MS. SULLIVAN: Okay.

PANEL MEMBER BLANC: -- I would leave it this way. That would be my recommendation, because your own people were confused. I was confused.

MS. SULLIVAN: Sure. Well, or I think it could at least -- it should come with a little bit more text and explanation.

PANEL MEMBER BLANC: Yeah. And then another thing that I think needs to be stated a little bit more explicitly is you allude to the fact that the test for trends were significant.

MS. SULLIVAN: Yes.

PANEL MEMBER BLANC: But like in the key table, that's part of the development of the acute exposure limit, where you have an asterisk for the one row, which is the pairwise comparison of the highest value to the control.

MS. SULLIVAN: Is this the derivation section?
PANEL MEMBER BLANC: Yeah.
MS. SULLIVAN: Okay.
PANEL MEMBER BLANC: Cort, can you go to that?
MS. SULLIVAN: Let me just get there.
CHAIRPERSON ANASTASIO: Yeah, can you give me a page or a line number?
MS. SULLIVAN: So that's going to be, it looks like, page 57. That's the acute reference exposure level. And the table is actually on six -- that's not the derivation section. Almost there.
PANEL MEMBER BLANC: Yeah, it just follows that, doesn't it, the following pages, where you talk about the benchmarking dose and all that?
MS. SULLIVAN: Yes, Table 15. Yes.
PANEL MEMBER BLANC: Beyond Table 15, it's got to be, because this is about the -- not about the development.
CHAIRPERSON ANASTASIO: Sixteen?
PANEL MEMBER BLANC: No, keep going. Yeah, I think --
MS. SULLIVAN: That -- I discuss a clear dose response trend in Table 17.
PANEL MEMBER BLANC: Right. What do the asterisks mean, less than 0.05 compared to --

MS. SULLIVAN: Control.

PANEL MEMBER BLANC: -- Control, is that right?

MS. SULLIVAN: Yes. Statistical significance.

PANEL MEMBER BLANC: Right, but isn't -- if you did the technical -- shouldn't there be a p-value for that?

MS. SULLIVAN: You're breaking up. It was hard for me to hear your question.

PANEL MEMBER BLANC: As a statistically significant test for trend, shouldn't that p-value be presented somehow?

MS. SULLIVAN: Well, we didn't do a trend test. We were just referring to that there was a clear dose response there.

PANEL MEMBER BLANC: Well, maybe Dr. Ritz would like to comment. I would have to say that from a statistical point of view, you can't say one as kind of a narrative, if you -- if you mean it, what's -- where's the statistics to back it up?

MS. SULLIVAN: Sure.

PANEL MEMBER MESSER: I might -- if I could just briefly interject, if you want to appropriately draw that distinction, you might say data sets are included, if they show a clear observed dose response trend, and that would indicate that you're not doing a formal test.

PANEL MEMBER BLANC: Well, why wouldn't you do a formal test? I mean, wouldn't that support your argument?

PANEL MEMBER MESSER: Yeah, you certainly could. If you don't have access to the underlying data, we could talk about how to do that from the summary statistics.

PANEL MEMBER BLANC: And then can I ask a question about something that occurred in an earlier table in the same study where it's referred to that there was four limb weakness at the 125 concentration.

MS. SULLIVAN: Yes.

PANEL MEMBER BLANC: That's never alluded to again.

MS. SULLIVAN: Right, because the authors of that study discounted that.

PANEL MEMBER BLANC: I thought they discounted the other thing which they saw at the pre-

MS. SULLIVAN: They -- well, that it gave them additional strength, yes. Okay. So that's line 982 on the McKee study, and there was that one finding. I think the finding was --

PANEL MEMBER BLANC: Forelimb something.

MS. SULLIVAN: It was observed in the low exposure group only after the 8-hour exposure period. The authors state the finding is not treatment related because there was no dose response observed.

PANEL MEMBER BLANC: Uh-huh, because they didn't have it after the second dose.

MS. SULLIVAN: Well, right, they didn't provide the data after the second exposure, but on the third, they don't see that effect. And so you see that a lot with solvents, where you'll see an effect at the lower doses and at the higher doses, but I think it's because it's induced metabolism and the elimination has increased, that sometimes you don't see the same effects at the higher doses. And that's pretty consistent with a lot of the studies that I looked at.

PANEL MEMBER BLANC: So you are arguing that you use that as your endpoint, but I do think you need to comment. Since you have to spend so much time in the reference development about the study, you should at least clarify that why you couldn't use that or didn't use that.

MS. SULLIVAN: Sure.

PANEL MEMBER BLANC: Because it kind of is in the first part, but not in the second part.

MS. SULLIVAN: Okay. Yeah. And I was concerned that we didn't have the data nor could we get it for the second day exposures, not that it's Relevant for the acute per se, but I -- it would have provided me with more information, so that --

PANEL MEMBER BLANC: I can --

MS. SULLIVAN: -- I could see what was happening, but I can't.

PANEL MEMBER BLANC: So I think it's fair game to comment on that, because somewhere else you talk about the data.

MS. SULLIVAN: Correct. Yeah, in the derivation section I allude to it again I think, yes.

PANEL MEMBER BLANC: And then can you just clarify why we're using an 8-hour study for the acute, but we're not using the 8-hour study to inform the 8-hour exposure? Is it because --

MS. SULLIVAN: Right, because the 8-hour exposure is a chronic exposure. It's not a one-time exposure that would be -- that they would be exposed to --

PANEL MEMBER BLANC: Okay.

MS. SULLIVAN: -- 40 hours a week for, you know, a lifetime. A working day is eight hours.

PANEL MEMBER BLANC: I see. Okay. Thanks. That's helpful.

The other thing -- and then a lot of these other things are not major. To me, the most major confusion was the thing about -- that we already talked about about the hot spots. And is relevant to Dr. Ritz's comment about the public health relevance of this group of chemicals, because they -- they're not trivial releases. I think it

would be helpful if in the narrative where you talk about what the sources of exposure are, that Dr. Landolph alluded to as well, that some of its exposures scenarios that you then talk about later in the text, which weren't really clear to me from that narrative at the beginning. The most obvious to me was the one good human case report with the scintillation fluid --

MS. SULLIVAN: Um-hmm.

PANEL MEMBER BLANC: -- exposure and you say scintillation fluids a typically a hundred percent trimethylbenzene.

MS. SULLIVAN: Right.

PANEL MEMBER BLANC: But that was never mentioned at the beginning, in terms of other specialties. So it's good to be --

MS. SULLIVAN: It's not mention -- I'm sorry, not mentioned in the beginning in terms of?

PANEL MEMBER BLANC: You talk about it's used in -- it appears here and it appears there, and these other applications, but then you have an application, which is so blatant that you refer to it in the body of the text. So I think it would be good just to be consistent, even if it's a little bit pedantic to include some of it, if -- that one and if there are any others. For example, there's mention of asphalt somewhere later as

its source.

MS. SULLIVAN: Okay. My only question is where a reference exposure level is intended for the public, the scintillation fluids is a occupational exposure, you know, for lab workers, so --

PANEL MEMBER BLANC: Well, generally -- you've generally been quite broad in saying where things are used and don't say, well, I'm not going to mention this, because it's only occupational. So I don't know. It's up to you, but I -- my -- I reacted when I saw certain places, and I said, well, gee, I didn't -- because one of the useful things about this group of chemicals about talking about it is it's kind of a sleeper. I mean, I don't know what the other panel members think about it, but I was like really? This is in all of those things. This is 50 percent of white spirits in some cases. You know, it just -- I was taken aback and it was useful, education. I don't -- maybe Dr. Ritz wants to comment.

MS. SULLIVAN: I'll go -- I'll go back and take a look at those examples.

PANEL MEMBER BLANC: Yeah. And then a final question in terms of the Canadian paper that's fairly recent, and you may even have alluded to it in different contexts, where they looked at trends over time in biomonitoring results for various chemicals,

MS. SULLIVAN: Um-hmm.

PANEL MEMBER BLANC: And one of the isomers had dropped considerably. I think it was the one -- the symmetric, the one -- is it the 1,3 -- what's the symmetric one, 1,3 --

MS. SULLIVAN: 1,3,5- is --

PANEL MEMBER BLANC: 1,3,5-.

MS. SULLIVAN: Yeah.

PANEL MEMBER BLANC: Whereas one of the other isomers was one of the few biomonitoring environmental chemicals that had actually increased over time at a sharp increase.

MS. SULLIVAN: Oh, we did --

PANEL MEMBER BLANC: Do you have that paper?

MS. SULLIVAN: Yeah, we did include the Canadian biomonitoring study. I don't know if it's the exact one that you're referring to and --

PANEL MEMBER BLANC: Well, it must be, right?

MS. SULLIVAN: I think so. And the reason they saw a drop was they related it to air pollution to gasoline.

PANEL MEMBER BLANC: Then why did they see the increase in the other?

MS. SULLIVAN: Yeah, that's interesting. I don't know if that has to do with the formulation, but --

PANEL MEMBER BLANC: I would comment on it, because if it's relevant to California, if the --

MS. SULLIVAN: Okay.

PANEL MEMBER BLANC: -- uses and applications are changing, it could have an implications. Since -- I just thought that was a really interesting observation. If you're already citing that paper, I would -- so those are -- that's my shtick.

MS. SULLIVAN: Thank you.

CHAIRPERSON ANASTASIO: Thank you, paul.

Joe, did you have a follow-up on something Paul just discussed?

PANEL MEMBER LANDOLPH: Peripherally, if you wanted to keep going with Paul's. It's --

CHAIRPERSON ANASTASIO: I think Paul is done, but

PANEL MEMBER BLANC: I'm done, Joe.

PANEL MEMBER LANDOLPH: Okay. Thank you. Moira, I a question. I would -- I would predict that, you know, when you add these compounds to animals or humans and they -- you get some damage, that it eventually goes away as to compounds get metabolized and come out in the urine. Is it a reversible neurotoxicity or does it persist, if you --

MS. SULLIVAN: It does in at least one of the studies. On the neuromuscular function, which is rotarod

test, it did persist when they retested the animals several weeks after the final exposure.

PANEL MEMBER LANDOLPH: And did it persist completely or was it decaying in its effect?

MS. SULLIVAN: They didn't give that level of specificity I think. They just said that -- but I can go back elucidate that if there's additional information. But I know in the vestibular disorders like in humans, that is not recovered. Now, that's not just unique exposure to TMBs, but TMBs make up a large percent of the formulation.

But in some of the tests, like in the McKee acute test, they did find that after the cessation of exposure that the animals did revert back to full functionality in -- for example on the latencies in the task reward paradigm analyses. But I did notice that they were persistent. And in the Saillenfait study, which is the only developmental study with unique exposure to TMBs, those animals were impacted in terms of fetal body weight. So there are persistent effects.

PANEL MEMBER LANDOLPH: Thank you very much. You might -- you might want to mention that somewhere. I'll make you a note for that in the written comments, but you might want to point that ought.

MS. SULLIVAN: Thank you, okay.

PANEL MEMBER LANDOLPH: Thank you.

PANEL MEMBER RITZ: Do we know anything about the age of the animals tested when they were tested, the ones that didn't revert?

MS. SULLIVAN: Yes. Those animals, I think they were five months on the past rats.

PANEL MEMBER RITZ: Yeah, because then you're getting -- when you're getting to older animals, you're getting into the possibility of neurodegenerative disorders, so you would worry about elderly being exposed.

MS. SULLIVAN: Definitely.

CHAIRPERSON ANASTASIO: Okay. Let's move on to Karen. Karen, comments?

PANEL MEMBER MESSER: No additional comments from me. I'm happy to help with any technical issues afterwards, if there are any.

CHAIRPERSON ANASTASIO: Excellent. Thank you. Yeah, Moira, if you want to look at statistics of trends, Karen is your person.

MS. SULLIVAN: Perfect, because that's not my super power, so...

PANEL MEMBER MESSER: Happy to just briefly chat any time.

MS. SULLIVAN: Thank you very much.

CHAIRPERSON ANASTASIO: Yeah. Great. Thank you,

Karen.

Okay. Next, Ahmad, comments?

PANEL MEMBER BESARATINIA: Yeah. This is a very nicely prepared report and I enjoyed reading it. I was -- personally, I was interested in learning about the half-life of these compounds, either the isomers or the aggregate form of these TMBs. And I went through the document and there were quite a bit of scattered information here and there, but I was wondering, Moira, perhaps you may comment on that if this lack of information about the half-life of this compound is because it hasn't been well studied or is it a particular reason, because both the half-life of these compounds in blood and CNS, especially in CNS, is very crucial since most of these animal studies have done assessment of neurobehavioral performance. So it's important to know how long these isomers, for example, stay and exist. And since some of these tests were done, perhaps hours after termination of the exposure, one would want to know what is the time frame of elimination of these compound, particularly from CNS. I believe for your derivation studies you have used the McKee study, which is an --

MS. SULLIVAN: Yes.

PANEL MEMBER BESARATINIA: -- 8-hour exposure. And I understand that the assessment was done like

often -- within one hour after determination of exposure, if I remember correctly. So is it consistent with the elimination half-life of this compound from CNS in that --

MS. SULLIVAN: That was one of the concerning aspects of the McKee study, because the half-life is one hour --

PANEL MEMBER BESARATINIA: Okay.

MS. SULLIVAN: -- on the acute exposures, and they waited an hour after cessation of exposure to test those animals. And so I called that out in the document just because, you know, that is troubling that those assessments were supposed to be conducted right after the exposure ceased. And this shouldn't have been a one-hour wait on that, but the -- yeah, so that was concerning especially when you're only looking at a one 8-hour exposure --

PANEL MEMBER BESARATINIA: Yeah.

MS. SULLIVAN: -- and we didn't have any data for the second day, not that we used two-day exposures for an acute, you know, study, because we're really looking -- we really don't want to look at an exposure over 24 hours for an acute value. But nonetheless, it would have provided, as you're saying, some critical information on toxicokinetics. And --

PANEL MEMBER BESARATINIA: Yeah. Yeah, thank you

for mentioning it. Yeah, and, of course, when you're doing large-scale animal studies, sometimes it's logistically not feasible to do all these measurements, you know, right away, but perhaps it will be helpful to kind of make a note of it when you're reporting your results so that that would be a potential limitation of the study.

And the other thing that I wanted to mention was with regard to table -- I think, Table 3a and b, I think Paul already indicated one of the points with regard to the total emissions. I think it's page four of the document. Here, what I see is the point source emission rate from different facility for both aggregate TMBs and the individual isomer 1,2,4-TMB. I was trying to make a sense of it once.

The first thing with regard to the total emission, which was a little bit confusing based on the numbers. And the second thing I was trying to see why there is so much fluctuation in the total amount emitted? Is it because of the not -- reporting in certain years or certain businesses being shut down, or perhaps you might know something about it, because there is hardly any correlation between the number of facilities that have reported and the total emission, or is there any other reason, for example, they have done certain -- you know,

there has been some technological advances by which this emission is reduced that I'm not aware of.

MS. SULLIVAN: So I'm wondering if that's a question for the California Air Resources Board, because I'm not, you know, an expert on facilities reporting. I just collect the data from them. I don't have that level of specificity of information, but if you feel that this should be fleshed out more. Certainly, I can make a note of that.

PANEL MEMBER BESARATINIA: Well, if it -- out of my curiosity I wanted just to get a better understanding of this -- you know, this table, but I leave it up to your best judgment, however you feel like it.

MS. SULLIVAN: Okay. And I'll write that down. Can I direct your attention to one thing that you alluded to, which -- and ask you if you think this is sufficient. On line 1859 of the document, I did list the limitations going back just to the McKee study. I did list that the authors state based on previous pharmacokinetic work with TMBs, the hydrocarbons have half-times in the CNS of approximately an hour, and that the visual discrimination performance testing was completed within an hour after termination. So is that -- is that sufficient to what you alluded to before where you said lack of information about half-life how long do the isomers stay or exist, what is

the time frame, or did you want me to see if I can tease out not necessarily from this study, but any of the other studies that looked at CNS effects?

PANEL MEMBER BESARATINIA: I think this is sufficient, but since you have major headings throughout the document, perhaps this information could be included under a subheading, so that it becomes more visible.

MS. SULLIVAN: Okay. Thank you. Thank you.

CHAIRPERSON ANASTASIO: Thank you, Ahmad.

Any other comments?

PANEL MEMBER BESARATINIA: No, that it is and congratulations. Great work.

MS. SULLIVAN: Thank you very kindly.

CHAIRPERSON ANASTASIO: Great. Thanks, Ahmad.

Kathy, any comments.

PANEL MEMBER HAMMOND: No. Thank you for the good work and the comments I had have been made already. Thank you.

MS. SULLIVAN: Thank you.

CHAIRPERSON ANASTASIO: Okay. Excellent. If I'm not mistaken, I believe all Panel members have had a turn, but if I'm --

PANEL MEMBER BLANC: Cort, I just have one other thing I forgot to ask about.

CHAIRPERSON ANASTASIO: Sure, go ahead, Paul.

PANEL MEMBER BLANC: Does the implication of a lack of any chronic data equate to there never having a cancer endpoint animal two-year studies?

MS. SULLIVAN: Right. So there is one study that was not well conducted that did evaluate carcinogenicity and had no positive findings. I was overruled on including that piece of information.

PANEL MEMBER BLANC: Okay. And when you say it had no issue, not just no cancer outcomes, but no adverse outcomes of any sort.

MS. SULLIVAN: Yeah, it was a very poorly done study, and I don't -- I can't recall if they alluded to whether there was any mortality or any other effects, because I was asked not to pursue that, so I don't -- I could go back and -- yeah.

PANEL MEMBER BLANC: You know --

MS. SULLIVAN: But there was nothing else in addition to that --

PANEL MEMBER BLANC: Right. Right.

MS. SULLIVAN: -- very poorly done study, no.

PANEL MEMBER BLANC: Well, that's pretty shocking for such -- I don't know if ubiquitous --

MS. SULLIVAN: Yes.

PANEL MEMBER BLANC: -- is the right word, but --

MS. SULLIVAN: Yes.

PANEL MEMBER BLANC: -- for a study of this nature, it's shocking to me.

MS. SULLIVAN: I agree. I think the lack of mode of action and the lack of knowing which isozyme, I, myself, was shocked that a chemical that is used to this degree does -- has not been characterized far better than it has.

PANEL MEMBER BLANC: And when you went to -- it's a slightly different question of the same genre. When you went to the TLV documentation -- American Conference of Industrial Hygienists TLV documentation series, have they ever talked about this chemical?

MS. SULLIVAN: Yeah, they have a 25-part per million I think is the ACGIH on the trimethylbenzenes, and I think it's to do with irritation.

PANEL MEMBER BLANC: And there was nothing in there that you hadn't -- you didn't capture yourself, because sometimes they have industry stuff. That's why I'm asking. That's not published data.

MS. SULLIVAN: I could take a deeper look at that.

PANEL MEMBER BLANC: You might want to. And I -- assuming that the higher-ups that said you can't talk about bad carcinogenicity study are part of this discussion, or what will be privy to it, I would agree

with you that it is worth at least saying there's been only one openly published cancer study that was not well done, and could not be used.

MS. SULLIVAN: Yes.

PANEL MEMBER BLANC: You know, it wasn't useful to us.

MS. SULLIVAN: Well, my concern was that you or the public would ask about it. And I just -- yeah, I think it's worth...

PANEL MEMBER BLANC: Yes, I would -- and maybe other panelists should comment, but I would -- and in particular, Joe I think -- I would support these saying it's out there, but not very -- not useful, because of its quality.

MS. SULLIVAN: Okay. Yeah. Okay.

CHAIRPERSON ANASTASIO: Karen.

PANEL MEMBER MESSER: Yeah, this is a slightly different comment, but I just want to note on the ubiquitousness of exposure to these compounds. So this seems like a potentially very useful report and also to note that the household surveys show potentially chronic exposure levels well above. For a certain proportion of the population show chronic exposure levels at least up in Canada well above this REL or chronic exposure, so I think this is a potentially very useful report.

MS. SULLIVAN: Thank you, yes. That' correct, The Canada study does show that. They are above our microgram per cubic meter RELs and associated with asthma, at least the solvent exposures are, of which TMB forms a proportion. And those were indoor values largely. So, of course, we're dealing with the Air Resources Board and stationary sources and emissions from stacks as opposed to measuring indoor air, but. And those indoor air values are largely the result of tailpipe emissions, cars, so...

CHAIRPERSON ANASTASIO: Okay. Yeah. That's a good point, Karen.

Beate.

PANEL MEMBER RITZ: Yeah. Exactly, that was also my reasoning for making that first comment, you know, that people are actually breathing this as -- at these kind of levels and indoors. But coming back to the neurotoxicity, I -- I'm a little -- I don't know, it may not belong here, but when I saw that our ROS and RNS, reactive nitrogen species, and Oxygen Species are increasing in the brain, and that also dopamine and neuroadrenaline and some serotonin derivatives are all increased, then, you know, my warning lights go on towards Parkinson's and neurodegeneration, because you find -- and other possibly Alzheimer's as well, because you find all these proteins nitrosated in -- that are aggregating in the brain for

these neurodegenerative diseases. I don't know how and where you would mention any of this, because this is just -- these are animal studies and they're only very few. But it's kind of worrying me that, you know, you're saying these kind of events that we know are part of what an older brain shows when they develop these disorders.

MS. SULLIVAN: Okay.

PANEL MEMBER RITZ: And I wonder whether that deserves any mention, maybe even just a sentence.

MS. SULLIVAN: Okay. And of course, we do account for sensitive subpopulations in our values. So on the toxicokinetic and dynamic uncertainty factors, they're larger because we're accounting for sensitive subpopulations. I don't know that I specifically -- I don't think I did allude to elderly adults.

PANEL MEMBER RITZ: Yeah, I get that, but, you know, sensitive subpopulations are taken into account, but they're never mentioned. We mention neurodevelopment, but we are not mentioning the other end of the spectrum. Maybe it's worth at least mentioning.

MS. SULLIVAN: Thank you.

CHAIRPERSON ANASTASIO: Thank you, Beate.

Moira, I thought it was also a very well done document, so thank you for that. I had just one -- well, I had a couple minor comments I'll email to you. And I

had one that's a -- it's also a minor comment, but I just want to point it out. In the beginning of the document, I think you were typically using ppm as your primary measure of exposure. And then you'd have milligrams per cubic meter in parentheses, and I got used to that. And then at some point, in the document you switched --

MS. SULLIVAN: Okay.

CHAIRPERSON ANASTASIO: -- and you had milligrams per cubic meter as your primary, and then ppm was in parentheses. And all of a sudden, I had to completely shift my world view. So it would be very helpful if you could just pick one, you know, either one of those, as your primary exposure measure.

MS. SULLIVAN: Okay.

CHAIRPERSON ANASTASIO: Put that first always, put that in graphs, you know, like your benchmark response graph, and pick one unit for the primary and then have the other one always as secondary in parentheses.

MS. SULLIVAN: Thank you.

CHAIRPERSON ANASTASIO: And Vincent, I can see you're raising your hand, but I have no way to have you speak. There's no way to allow you to speak, so I'm sorry.

DR. MOHEGH: We are not accepting oral comments on this item.

CHAIRPERSON ANASTASIO: Yeah, Vincent is actually and OEHHA guy, but since he's -- appears to be just general population, it's

DR. MOHEGH: Oh, I can allow.

CHAIRPERSON ANASTASIO: Oh, You can allow. Okay. Yeah, let's allow Vincent. Let's see what he wants to say.

DR. KRISHNAN: You send the invite.

DR. MOHEGH: Vincent, you can unmute yourself.

DR. COGLIANO: Hello, I'm sorry. I didn't really mean to raise my hand. I think the cursor just got caught on the button, and after a bit it raised it automatically. Sorry about that interruption

CHAIRPERSON ANASTASIO: No problem.

PANEL MEMBER BLANC: Paul Blanc here. I want to circle back to one other thing about -- to follow up on the vulnerable populations and the rationales. It's mentioned that -- in the uncertainty factors it mentioned that children would be vulnerable because of the neurological outcome.

MS. SULLIVAN: Yes.

PANEL MEMBER BLANC: But elsewhere you allude to asthma in a couple of different contexts. You just mentioned in terms of the Canadian study and then in the durable data things had, you know -- the authors positive

about they didn't look at the lung, but the lung cells might have had the same -- might have the same response. So typically, we have included respiratory -- asthma is also sort of triggering the childhood vulnerable population. So I don't know whether for consistency this is an OEHHA, you know --

MS. SULLIVAN: Right. So my thinking on that was that because those exposures where they saw an increase in asthma or persistent asthma, and it implicated -- you know, TMBs were part of the mixture, but it wasn't unique exposure, so one couldn't really have a causal type of assessment there, that I -- there is one animal study that deals with respiratory irritation. And so there's also occupational exposure. So in our technical support document for OEHHA, the sensitive subpopulations are if it is a neurotoxicant or a respiratory toxicant, then we include extra factors. So it is folded in, but are you suggesting that you would like me to actually just add that?

PANEL MEMBER BLANC: Well, parenthetically I'm saying, you know, predominantly -- we were adding this section predominantly for neuro reasons and/or -- so respiratory.

MS. SULLIVAN: Okay.

PANEL MEMBER BLANC: Not to mention what --

however you want to say it, because when you don't say it, it sounds -- it could be taken to imply that you're so discounting the respiratory, but you're -- you know, it doesn't exist, do something. But it really is -- I don't feel strongly about it, but I just -- it struck me -- I forgot to mention it earlier when I was reading in this stuff that, you know, there are respiratory, because you talk about it.

MS. SULLIVAN: Sure. I can certainly run that by EO and see if we can just add that, yeah. I think I had it in earlier iterations.

PANEL MEMBER MESSER: I think you do mention it at the very end when you talk about differential sensitivity of children, but it's kind of buried.

MS. SULLIVAN: Yes, I'm sure I make some reference to their higher breathing -- breathing rates and greater surface area. And I make some reference to --

PANEL MEMBER MESSER: On line 2114, you talk about it. I don't know if that's enough to address Paul's comment.

MS. SULLIVAN: Okay. Right. Starting at 2108. I do say at 2 -- line 2108, "Additionally, individuals with pre-existing respiratory conditions, such as asthma or allergies, may be more sensitive to the respiratory effects resulting from exposure to TMBs." And that's

under the section, "Evidence for Differential Sensitivity of Children". Does that -- is that sufficient, line 2108?

PANEL MEMBER BLANC: I would also put it in where you talk about the calculation, because that's where -- you know, that's what your justification for the additional fact is because of neurologic effects which would be relevant to children. So I think maybe it's overkill, but that's where I would have expected the asthma comment to be also.

MS. SULLIVAN: I think it's just because we didn't have any data, but sure.

PANEL MEMBER BLANC: I don't feel strongly.

CHAIRPERSON ANASTASIO: Okay. Great. Any final comments from the Panel?

If not, my reading of the document, as well as my understanding of everyone's comments is the comments are fairly minor, so I propose that Moira and other OEHHA people revise it, and then just send it to me and I'll read through it, and then give the final approval. If anyone else would like to take a look at the document that's revised before it gets approved, let me know and I'm happy to include you on that chain, but otherwise I'll just deal with it.

PANEL MEMBER BLANC: Cort, can you include in the minutes that you'll -- your review will also include the

written comments of the other lead?

CHAIRPERSON ANASTASIO: Yes, good point. I've -- yes, I will do that.

Okay. Okay. Great. Well, thank you very much, Moira. We appreciate your work on this.

MS. SULLIVAN: Thank you kindly.

CHAIRPERSON ANASTASIO: We are running about 10 minutes early, which is just how I like it, so we're going to take a 10-minute break now and we're going to reassemble at 11. So, Daryn, we'll be having your cobalt presentation at 11 instead of 11:10. So I'll see everyone in 10 minutes.

Thank you very much.

(Off record: 10:50 a.m.)

(Thereupon a recess was taken.)

(On record: 11:00 a.m.)

CHAIRPERSON ANASTASIO: Okay. Welcome back. Panel members, if you could turn on your cameras, so I know you're here so that we have a quorum, that would be very helpful.

Okay. I think we're set. Daryn, are you ready?

DR. DODGE: Yes, I'm ready.

CHAIRPERSON ANASTASIO: Okay. And Arash, are you ready?

DR. MOHEGH: I'm ready.

CHAIRPERSON ANASTASIO: Fantastic. Daryn, thank you for being here. So our next item is a review -- or an update rather to the inhalation unit risk for cobalt sulfate heptahydrate. So Daryn is going to present a draft document that corrects the cancer inhalation unit risk factors, or IURs, for cobalt sulfate heptahydrate and water soluble cobalt compounds. Cancer IURs are used to estimate lifetime cancer risks associated with inhalation exposure to a carcinogen. For the cobalt sulfate heptahydrate and water soluble cobalt compounds, OEHHA corrected and updated the conversion factor used to normalize for the constant of cobalt in cobalt sulfate heptahydrate, and corrected a separate error in the final derivation of the current IUR value that was published in 2020.

The draft of this update was posted on May 5th and that commenced the 30-day public review period, which included two public workshops. And Daryn perhaps, beginning your presentation, you could indicate whether we received any public comments or not. So with that, I'd like to introduce Dr. Daryn Dodge, Staff Toxicologist from OEHHA's Air and Toxicology Risk Assessment Section. Thank you, Daryn.

(Thereupon a slide presentation).

DR. DODGE: Thank you, Dr. Cort Anastasio.

Arash, could you go to the next slide?

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DR. DODGE: Okay. This update or correction to the IUR is for cobalt sulfate heptahydrate, as Cort said. And we have two corrections.

The first was the update in response to a correction made recently to the NTP report for cobalt sulfate heptahydrate. The second is a correction due to a calculation error on our part.

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DR. DODGE: Now, as some of you may recall, there was a cobalt and cobalt compounds cancer IUR factors document that came out in October of 2020. The SRP, I believe, reviewed this document in 2019, as Cort alluded to, at the beginning of today's SRP meeting. In this document, we derived an IUR, or inhalation unit risk, factor for cobalt metal and poorly soluble cobalt compounds. This IUR was 7.7 times 10 to the minus 3 per microgram per cubic meter. This can also -- the units can also be referred to as micrograms per cubic meter to the minus 1.

We also, in the same document, derived a IUR for cobalt sulfate heptahydrate and other water soluble cobalt compounds. This IUR is 8.6 times 10 to the minus 4 per

microgram per cubic meter. And this is the IUR that we are updating. We are not changing the one for cobalt, metal, and other poorly soluble compounds.

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DR. DODGE: In 2022, the NTP, or National Toxicology Program, published a correction in toxicological sciences. This is for technical report 471, which is specifically the two-year rodent study for cobalt sulfate heptahydrate. In it, they noted that the concentrations they were using in that report actually were expressed as the anhydrous salt of cobalt sulfate and not as cobalt sulfate heptahydrate or even the hexahydrate as they were -- as was referred to in the document. So this changes our IUR in and of itself.

Next slide, please.

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DR. DODGE: So to clarify here, there is a couple of things I want to point out for the cobalt sulfate exposures in the National Toxicology Program, or NTP, two-year rodent exposure study. The first point is that an aqueous solution of cobalt sulfate heptahydrate was aerosolized for the exposures of the rodents. That's why we refer to the exposure study as a cobalt sulfate heptahydrate exposure study throughout our document as

well as NTP's. However, in the Chamber -- exposure chambers themselves, the rodents were exposed primarily to the hexahydrate form. And so in the process of aerosolization, there was a loss of a water molecule. And then the exposure concentrations used in the NTP study of 0.3, 1, and 3.01 milligrams per cubic meter are expressed as the cobalt sulfate anhydrous salt, and not as the heptahydrate or the hexahydrate as stated in the NTP report.

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DR. DODGE: Now, because the cobalt ion is considered to be the primary factor for cancer risk, our calculated cancer slope factor, or CSF, was normalized to the content of cobalt in the IUR document from 2020. And this is done by taking the molecular weight of cobalt, which 58.9 divided by the molecular weight of what we thought at the time was the hexahydrate 263.1. And this gives a molecular weight fraction of cobalt of 0.22.

Now, because of the update or correction in the NTP study, we express it as the anhydrous salt. The actual molecular weight fraction should be 58.9 over 155. And this is a molecular fraction of 0.38. So ultimately, this would change the cancer potency of the IUR by 1.7X or 1.7 times.

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DR. DODGE: Now, this other correction we need to make was due to a calculation error on our part. In the final calculation of the cancer slope factor, the cobalt normalized CSF was corrected to show that the molecular weight fraction of cobalt in cobalt sulfate is divided into rather than multiplied by the cancer slope factor. So the correct way to express this cobalt normalized cancer slope factor is 13.41 per milligram kilogram day divided by 0.38, not multiplied by.

So this resulted in a updated cancer slope factor of 35 per milligram cobalt per kilogram day. Now, our previous cancer slope factor cobalt normalized was 3.0. So we're increasing the potency by over tenfold here.

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DR. DODGE: In the final calculation, we get to the inhalation unit risk, or IUR. And this is done by taken the cancer slope factor normalized to cobalt multiplied by the 20 cubic meters per day, which is a default factor for adult intake of air per day, divided by a average adult body weight of 70 kilograms, and including a conversion factor going from milligrams to micrograms. This gave us a final IUR value of 1.0 times 10 to the

minus 2 per microgram per cubic meter.

Now, we could get to this same cancer slope factor of 35, if we were to normalize the cobalt concentrations at the very beginning of our derivation from 3 -- 0.31 and 3 to 0.114, 0.38, and 1.14. If you start your derivation of the IUR with these cobalt normalized numbers, you arrive at the same value of 35 for the cancer slope factor.

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DR. DODGE: We include the changes to the document in a summary of changes document. This describes where in the cobalt and cobalt sulfate -- I'm sorry, cobalt and cobalt compounds IUR document where the changes occurred. Primarily, this is footnotes added to note that the cobalt sulfate concentration are expressed as the anhydrous salt. We also added a similar or same statement to table legends of the tumor incidence tables. And we modified the final calculation in the text to show the corrected cancer slope factor and IUR.

Next slide, please.

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DR. DODGE: Now, as Cort mentioned, we didn't receive any public comments on the draft cobalt IUR document during the public review period, which was from

May 5th to June 5th of this year. We held two public workshops as required in the Hot Spots Act. The first was in Southern California, Diamond Bar, in May 23rd, and then the one in Northern California was in Sacramento -- here in Sacramento where I am on May 31st and this was webcast.

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DR. DODGE: That concludes my presentation.

CHAIRPERSON ANASTASIO: Alright. Thank you very much, Daryn. Panel members, comments? Okay. While we're waiting for the other Panel members, let me have a -- I just have a couple minor comments. One is, yeah, it's very confusing, right, where you've got all these numbers without units, whether you divide by 0.38 or multiply by 0.38. If you actually keep your units on the numbers and put what compound the mass is for, it might help not to do that reverse. You know, if you know it's grams of cobalt per gram of cobalt sulfate, then you're not going to flip it around in the calculation, so just one suggestion.

I wonder too, given that this is a very easy mistake to make, have you guys gone back and checked other IURs for metal complexes to make sure that that error hasn't happened previously?

DR. DODGE: I have not looked at the previous documents with that much scrutiny, but we probably should.

CHAIRPERSON ANASTASIO: Yeah, there probably aren't a lot, so it seems like it would be helpful, given that it's an easy mistake to make.

And then my last comment was about the revised table. So, for example, Table 4, I think, the footnote A is good. You know, you're talking about concentrations are expressed as anhydrous cobalt sulfate, but it's still a little confusing, because the title of the table talks about exposure to the cobalt sulfate heptahydrate. So I'd suggest just a little bit more text on that Footnote A, something like, you know, the exposure was to the cobalt sulfate heptahydrate, but the exposure concentrations are listed as the anhydrous cobalt sulfate, just to very clearly spell it out so that future people aren't confused about what's going on.

DR. DODGE: Okay. Thank you, Cort. We'll do that.

CHAIRPERSON ANASTASIO: You're welcome.

Those are my only comments. Did anyone else have any other comments?

Karen.

PANEL MEMBER MESSER: Yeah, I'm also quite sympathetic to making this kind of calculation error. When you're doing a lot of very detailed calculations, my group at the cancer center, does a lot of those, and we

have a lot of people doing them. I'm sure your group has thought about developing templates for those routine computations, so just a page that you can all share that very carefully spells out the computation that you can just paste in these reports that can save a lot of time. And I'm sure you have such a thing. It may be more or less informal, so it might be worthwhile to just have a shared directory where you've got some of those common templates that people have carefully vetted and you can use them. That can save people time and help with accuracy. A common, common thing to manage with these big reports.

CHAIRPERSON ANASTASIO: Thank you, Karen. Good suggestion. Other comments from the Panel?

I never know when the panel is going to be very chatty or when the Panel is not going to have much to say. And apparently, right now, we don't have much to say.

PANEL MEMBER BLANC: Well, what can we say? It's a very technical -- and just a corrective --

CHAIRPERSON ANASTASIO: Right. Right. It seems very straightforward. I mean it's great that you guys caught the error, and that the NTP found the error in the concentration. But right, there's not a lot for discussion.

PANEL MEMBER MESSER: I also think it speaks

highly of the process that when an error was published in the literature, it was caught and the relevant documents were updated. That shows good --

CHAIRPERSON ANASTASIO: Yeah, that's impressive, right. Somebody is reading the literature and keeping track of what's been done in the past for, in this case, an IUR. Yeah.

All right. Well, thank you very much, Daryn. Appreciate the input and appreciate the correction.

In terms of next steps, you've laid out in your document all the changes, and they all look good. So I don't feel like I need to see the document again before it's approved. I think you can just go ahead and make the corrections that you've laid out and that we've all looked at.

DR. DODGE: Okay. Thank you. Yeah, I'll make the correction that you specified, Cort.

CHAIRPERSON ANASTASIO: Yeah, that's sound great.

DR. DODGE: Okay.

CHAIRPERSON ANASTASIO: All right. Great. Thank you very much, Daryn.

DR. DODGE: Thank you.

DR. KRISHNAN: Thank you.

CHAIRPERSON ANASTASIO: Okay. Our next item, number 4, is an information item from OEHHA on a topic

that we've discussed a few times in the past, the expedited development of health guidance values.

So as we've discussed previous, there is an opportunity to speak the development of health guidance values by leveraging the work of other OEHHA programs and authoritative agencies like EPA. So this is a follow-up to OEHHA's presentations to the SRP on July 9th and October 9th of 2020. And Heather Bolstad, who is a staff toxicologist from OEHHA's Air and Climate Epidemiology Section is going to give us an overview of a possible expedited process for developing health guidance values.

So, Heather, the floor is yours.

(Thereupon a slide presentation).

DR. BOLSTAD: Great. Thank you. Good morning. My name is Heather Bolstad. I'm a toxicologist with the Office of Environmental Health Hazard Assessment or OEHHA. And today I'll be providing and update on our efforts to develop expedited health guidance values for hot spots compounds.

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DR. BOLSTAD: So just a little background on hot spots. The Assembly Bill 2588, Air Toxics Hot Spots Emission Inventory Criteria and Guidelines Regulations, which I'll refer to as Hot Spots, was first enacted in 1987 and has been amended several times since. It

requires stationary sources to report the types and quantities of certain compounds released into the air. And it's goals are to collect emission data, identify facilities having localized impacts, determine health risks, notify nearby residents of significant risks, and reduce significant risks to acceptable levels. It requires reporting of approximately 1,500 compounds.

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DR. BOLSTAD: So as you know, OEHHA develops public guidance values for us in Hot Spots, specifically the reference exposure levels, or RELs, for non-cancer effects, and the inhalation unit risks and slope factors for cancer effects. The SRP has reviewed many of these values and continues to do so as evidenced by today's agenda. Both types of values are used in Hot Spots Facility Prioritization and Risk Assessment and to provide greater impetus for reporting of emissions under Hot Spots. So they have important applications.

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DR. BOLSTAD: However, Hot Spots assessments to produce RELs and cancer potencies require significant time and resources. OEHHA conducts a comprehensive evaluation of the literature. And this process, along with internal peer review, is time-consuming. As result, draft assessments are submitted for public and SRP review at the

rate of about one to three compounds per year.

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DR. BOLSTAD: This pace is dwarfed by the number of compounds on the Hot Spots list that do not have OEHHA-derived Hot Spots values. Approximately, 700 compounds, or half of them, have neither an OEHHA Hot Spots value nor a value from some other agency as identified by CARB.

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DR. BOLSTAD: These 700 compounds span a diverse array of chemical classes as shown here, and include some familiar ones.

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DR. BOLSTAD: We are envisioning three possible approaches to expedite development of health guidance values for Hot Spots. One is by simply adopting and adapting recent health values from other OEHHA programs, such as the Public Health Goals for drinking water, also known as PHGs, or the Proposition 65 values for carcinogens. Hot Spots obviously concerns inhalation exposures, and thus the priority would be those values from other OEHHA programs that are based on inhalation studies which is often the case.

The second approach is to adopt or adapt values from other entities such as the U.S. EPA. We presented a

methodology for identification and evaluation of such values to the SRP in 2020, along with methods by which they can be adjusted as needed to serve the purposes of an inhalation risk assessment for the general population.

Third, computational toxicology and new approach methodology, or NAMs, may be used to derive values for data-poor compounds. OEHHA is in the process of building capacity in this area through collaborations with academic partners and creation of a new section within OEHHA who's aim is to further the development of NAMs based regulatory values. We will provide updates on these efforts at future SRP meetings.

All three of these approaches were used by OEHHA to develop values for the CARB-led Study of Neighborhood Air near Petroleum Sources, also known as SNAPS. Our initial focus is on the first approach and to specifically adopt cancer potency values based on inhalation studies from other OEHHA programs. We would start with values produced by OEHHA within the last 10 years.

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DR. BOLSTAD: Now, you may be wondering why we'd adopt a drinking water value for the Hot Spots Program, and I'd like to clarify that point. This is among the things that must be considered when adopting and adapting values from other OEHHA programs. I provide examples of

two OEHHA programs here. So the public health goals are drinking water concentrations that take into account drinking water intake rates. Thus, we would not adopt the public health goal itself, but rather the basis of the public health goal. Specifically for non-cancer effects, it would be the point of departure divided by uncertainty factors. While for cancer, it would be the potency.

For Proposition 65, we have two kinds of values, one for non-cancer effect and one for cancer. The non-cancer value is known as the maximal -- maximum allowable dose level, or MADL, for short. It is developed for reproductive and developmental toxicity endpoints. And it has a specific definition in that a level one thousand times greater than the MADL is expected to have no observable effect.

The cancer value is known as a no significant risk level, or NSRL, and also has a specific definition in that it is the dose in micrograms per day associated with a 10 to the minus 5th cancer risk. As for the public health goals, the basis of the proposition --

Excuse me?

As for the public health goals, the basis of the Proposition 65 values would be adopted, not the values themselves. For the MADL, the point of departure divided by uncertainty factors selected per OEHHA REL guidance

would be adopted. For the NSRL, the cancer potency would be adopted.

And for the non-cancer points of departure, I want to note that the nature of the critical study would determine whether it would serve as an acute or chronic value.

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DR. BOLSTAD: As I said, our initial focus is on adopting points of departure based on inhalation studies. At some point, we will also consider adopting values based on oral studies, which will require special consideration.

First, there can be endpoints from oral exposure that may not be relevant inhalation exposure, such as effects resulting from interference with nutrient absorption, or port of entry effects. The other is that there are endpoints by the inhalation route that may be more sensitive or unique to this route and would be overlooked by using a value from an oral study.

Example endpoints include irritation of the respiratory tract, eye, or membranes, as well as respiratory sensitization, and lung and nasal tumors. As a result of these issues, we will adopt the most scientifically justifiable health guidance value.

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DR. BOLSTAD: Prior to adoption, we need to

ensure that the literature published since the value was derived does not contain any potentially influential studies. A possible approach could look something like this. The literature search would begin where the previous assessment's literature search ended. New studies suitable for quantitative dose response analysis would be identified. These would consist of mammalian bioassays of sufficient duration that, in the case of cancer, provide tumor incidences, as well as epidemiology studies with quantitative estimates of both exposure and risk. If there was a high quality study that was more sensitive or more appropriate than the study used to derive the established value, we would consider updating the value. In the absence of such a study, we would adopt or adapt the established OEHHA value.

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DR. BOLSTAD: We've identified some first round candidates for adoption. These include the Proposition 65 cancer values for bromoethane, also known as ethyl bromide, trichloroethylene, and vinylidene chloride. Trichloroethylene actually has a Hot Spots potency, but the Proposition 65 value is newer and is base on epidemiology studies rather than animal studies.

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DR. BOLSTAD: In terms of our next steps, we will

start by developing expedited numbers through adoption of cancer potencies from other OEHHA programs with an initial focus on recent public health goals or Proposition 65 values. We will release the expedited values for public comment and bring them to the SRP for review.

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DR. BOLSTAD: In the future, we will also identify additional sources of health values to add to those identified by CARB. And finally, our New Toxicology Evaluation Section, or NTES within OEHHA will be using NAMS to derive regulatory health guidance values.

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DR. BOLSTAD: That concludes my presentation and I welcome any comments or questions you might have.

CHAIRPERSON ANASTASIO: Thank you very much, Heather.

Panel, comments, questions?

PANEL MEMBER MESSER: I guess I have a -- just a sort of calculation question, which is it seems that these numbers that are going to be adopted may already have some uncertainty -- some allowances for uncertainty built into them, like the one thousand times the exposure is still expected not to create any adverse effects. So I just wonder if that should be taken into account?

You know my understanding of the point of

departure is that then you make these uncertainty adjustments on top of a point of departure. So I wonder if there's -- if that's leading to some redundancy for if you've thought about that.

DR. BOLSTAD: That's a great point. We'll definitely keep that in mind, so there's no double counting of uncertainty factors.

PANEL MEMBER MESSER: Yeah. You know, I don't know how formally you can balance that, but you should at least think about it.

DR. BOLSTAD: Right. Thank you.

PANEL MEMBER MESSER: Yeah.

CHAIRPERSON ANASTASIO: Thank you, Karen.

Ahmad.

PANEL MEMBER BESARATINIA: Yeah. I think in view of what you are proposing to take advantage of already existing report from OEHHA, or other, you know, groups associated with EPA, it is important for all reports that are being produced to have a uniform section for identifying their search criteria, what kind of literature, what time frame was used to identify literature to be included or excluded in the report. As I recall, some of the more recent report do include this section, but many do not. So perhaps that is something that you might consider as a group and as an organization

for future reports or even going back, and retroactively like insert this section into existing reports.

DR. BOLSTAD: Okay. Thank you.

CHAIRPERSON ANASTASIO: Thank you, Ahmad.

Other Panel comments?

I have some questions, Heather. Can you go -- can you put your slides back up and can you show us the pie chart that showed of the Hot Spots compounds, which ones have health guidance values, which ones do not?

Okay. So you've got 1,500 compounds. Twenty percent of those have a health guidance values that's been approved. So -- okay. So OEHHA approved Hot Spots health values. That's not just RELs, but that's also things like the public health goals and the Prop 65 or is that -- are those in the --

DR. BOLSTAD: No, the 20 percent, thd 293, those are only Hot Spots values --

CHAIRPERSON ANASTASIO: Okay.

DR. BOLSTAD: -- so they don't include our other values.

CHAIRPERSON ANASTASIO: Those are official Hot Spots values.

DR. BOLSTAD: Yes.

CHAIRPERSON ANASTASIO: Okay. And then this blue color, does that include the public health goals and the

Prop 65, or no?

DR. BOLSTAD: I believe it does.

CHAIRPERSON ANASTASIO: It does.

DR. BOLSTAD: But it also includes like U.S. EPA, ATSDR, ACGIH, OSHA PELs.

CHAIRPERSON ANASTASIO: Gotcha. Okay. So some government health guidance value. Okay. So there's a lot of potential here then in terms of increasing the number of compounds that we have on the Hot Spots list, which we are all for. So that's great. So when Kannan presented to us -- I can't remember when it was now, maybe 2020, he was talking primarily about using literature reviews of other compound -- or of -- of a compound that had been assembled by say EPA and not have to repeat that, not have to go back and recreate that material. But what you're talking about now is going beyond that, right? You're talking about actually using some health guidance values for other programs, like Prop 65, and applying those to Hot Spots?

DR. BOLSTAD: Yes.

CHAIRPERSON ANASTASIO: Okay. That's great, in the sense that, you know, it really expands the scope of what's possible.

DR. BOLSTAD: Yes. And it is interesting that many of our public health goals are actually based on

long-term inhalation studies --

CHAIRPERSON ANASTASIO: Oh.

DR. BOLSTAD: -- particularly, you know, for the volatile compounds just based on the data availability.

CHAIRPERSON ANASTASIO: That was going to be my other question is, so you're saying a lot of these drinking water standards are actually based on inhalation studies?

DR. BOLSTAD: (Nods head).

CHAIRPERSON ANASTASIO: Wow. Okay. That's great.

PANEL MEMBER RITZ: So that was actually one of my questions too. I mean, some of -- some of these 703 that might be evaluated in water are probably because water is the main source, right, so for PFAS, for example. And it is a different route. Would you then not have to reevaluate what happens if it's in the air and inhaled, and gets kind of into the body, and into the brain, and wherever else in a slightly different way?

DR. BOLSTAD: We would definitely need to consider the pharmacokinetic differences between the routes, which I kind of alluded to in terms of portal of entry effects and like some metals interfere with nutrient absorption, which wouldn't necessarily be relevant via inhalation, that sort of thing. In terms of volatility,

we would also use the likelihood that a compound would be in the air and inhaled to try to prioritize these 703.

CHAIRPERSON ANASTASIO: Thank you, Beate.

Karen.

PANEL MEMBER MESSER: Yeah, I guess this last -- your last remark is what I was going to -- what I was thinking about was with such a long list of compounds, it seems like it would payoff to put some initial effort into prioritization, and that should be given some thought and structured, so that it's transparent and well understood how you'd be prioritizing these compounds. That seems like it would be well worth the effort, either on the basis of some kind of ballpark estimate of harm, you know, intensity in number of persons, or risk more like, before you've done the assessment. You may not understand the harms, but your understanding of the risk of major harm.

And then, I guess, the second thing would be when you're using these preexisting studies, it might be worthwhile to do a couple of pilot examples and see how much time you actually save, because the time savings may not be as much as you are hoping, if you still have to do a literature review and write a whole report. So that might help also to do some pilot studies and see how much time you save and then think critically is there a way to streamline that, be more efficient in the use of prior

information, just general suggestions.

DR. BOLSTAD: Okay. Thank you.

CHAIRPERSON ANASTASIO: On a related note, you know, so you go through the compounds that have inhalation studies, and that's very straightforward. But then you start to get to compounds where you have other routes of exposure. And my question is how do you know whether you're right? So let's say you have an oral inhal -- an oral exposure and you do some correction to adjust for that, are there compounds where you have both inhalation and oral exposures, where you can look at what you would get for the -- for a REL from the two routes and you can see, okay, yeah, if we use the oral, we get this. And I guess the question is how do you know if you're correct from a non-inhalation exposure?

DR. BOLSTAD: That is one thing we could do is look at those compounds that have both like a cancer bioassay by the oral route and the inhalation route. And I think our cancer potency guidance discusses this. And I believe that the oral potency is generally predictive of the inhalation potency. Inhalation may be a little more potent. I'd have to double check that, but that's something we can look at. And then the SRP actually brought this up when we presented in 2020 on this topic about, for example, missing respiratory sensitizers by

using an oral value.

And so how we've addressed that is by using the OECD toolbox, the QSAR toolbox to predict respiratory sensitizers based on the chemical structure to try to not miss any alerts. And this can also be assessed just based on chemical class, like isocyanates I'd expect to be respiratory sensitizers. So that sort of thing. So that's a good question, like definitely kind of ground truthing as we go. But one thing to keep in mind is that in the absence of a value, we're assuming zero risk, so there is benefit to having a value.

CHAIRPERSON ANASTASIO: Yeah. And I know we've talked on the panel before about provisional health guidance values, where it might be better to just get an order of magnitude number up there just so that you can start to assess risks from compounds that currently have assumed zero risk. And I think that's another potential approach for, you know, say oral exposure route compounds.

DR. BOLSTAD: (Nods head).

CHAIRPERSON ANASTASIO: Yeah. Well, I can speak on be of myself, and I think the rest of the Panel, we'd be very interested to see how this plays out and especially some of the ground truthing as you go along, you know, will help us feel more comfortable I think with the approach.

I'm also very interested, and I can't remember what the acronym stood for, but the NAMS, right, the toxicologic, so the computational approaches to toxicology, because animal and human studies are so expensive and time-consuming that I'm very hopeful that the computational work is going to start to bear fruit. Otherwise we're never going to get to, you know, the majority of these 1,500 compounds. It's going to take something faster even than what you're suggesting right now, yeah.

DR. BOLSTAD: Right.

CHAIRPERSON ANASTASIO: But we -- yeah, I'm very encouraging of approaches that can speed up the development of health guidance values, and this is a nice step in that. Yeah.

Any other comments from the Panel.

Karen.

PANEL MEMBER MESSER: Yeah, just following on the tiered approach. I think there's a lot of promise there, especially with computational approaches. Those could be a rapid first pass and then those could be used to prioritize compounds for a deeper dive and validation. That could work very nicely.

CHAIRPERSON ANASTASIO: Yeah, good point.

DR. BOLSTAD: (Nods head).

CHAIRPERSON ANASTASIO: Okay. Seeing no other comments, thank you very much, Heather. We look forward to getting an update.

DR. BOLSTAD: Great. Thank you so much.

CHAIRPERSON ANASTASIO: This is a very, very encouraging route. Yeah.

Let's see we're at 11:41. We were planning for lunch next, but instead, if Kannan is ready, I suggest we move to the ethylene oxide informational item and then we'll take lunch after that. Kannan, are you prepared to start with that?

DR. KRISHNAN: Yeah.

CHAIRPERSON ANASTASIO: Fantastic. Okay. So the next item then, Item number 5, is information item from OEHHA on the recent release of draft updated cancer inhalation unit risk factor for ethylene oxide. OEHHA recently released this draft for public review. And the updated IUR ethylene oxide is based on current evidence, including human epidemiological studies. The current value is based on animal studies and was developed in 1987 when OEHHA was part of the California Department of Health Services.

The current draft, the new draft, was posted on April 7th, 2023 for public comments and included workshops in both Southern and Northern California in May, and OEHHA

staff are going to give a preview to the panel on the IUR update. So this is not a formal review for ethylene oxide IUR, but it's a little informational item.

So Dr. Kannan Krishnan, Chair of Air and Site Assessment and Climate Indicators Branch of OEHHA will be giving the presentation. Thank you, Kannan.

(Thereupon a slide presentation).

DR. KRISHNAN: Thank you. And good morning, everyone. Let me pull up my slides.

Are you seeing -- able to see the slide full screen?

CHAIRPERSON ANASTASIO: (Thumb up).

DR. KRISHNAN: Thank you for the introduction. This is an information item on the recent release of the draft updated cancer inhalation unit risk factor for ethylene oxide. It's more of a status report. And I just wanted to follow up on the previous presentation I made to the Panel on 12th of May last year.

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DR. KRISHNAN: Maybe just by way of a very quick introduction. Ethylene oxide is mainly used -- predominantly used as a chemical intermediate in producing other chemicals, particularly ethylene glycol and antifreeze. And in California, as in other places elsewhere, it is used as a sterilizer for medical and

laboratory equipment and supplies. It's also used as a fumigant for agricultural products, particularly when the materials are damaged by heat or other methods of sterilization are ineffective.

Ethylene oxide is identified as a carcinogen under Proposition 65 and the U.S. Environmental Protection Agency has classified it as a -- as carcinogenic to humans or a Group 1 Carcinogen, carcinogenic to humans. And IARC designated it as a Group 1 carcinogen, or carcinogenic to humans, based on limited evidence in humans, sufficient evidence in animals, supported by strong mechanistic evidence or evidence of genotoxicity. The National Toxicology Program as well concluded that it is known to be a human carcinogen.

And OEHHA agrees with these conclusions as we presented in the draft submitted for public review. We agree with these conclusions regarding the ethylene oxide carcinogenicity.

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DR. KRISHNAN: The inhalation unit risk factor for ethylene oxide, or IUR, was developed initially in 1987 when OEHHA was part of the California Department of Health Services, or CDHS, and was based on animal cancer studies. Since then, the knowledge base has grown and new relevant human epidemiological studies have become

available. And that has been used by U.S. Environmental Protection Agency to update its IUR for ethylene oxide in 2016 after a comprehensive evaluation.

In its assessment, EPA used a human epidemiological study for 17,530 workers in sterilization facilities in the U.S. And their assessment review received public comments and was peer-reviewed by this cancer panel.

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DR. KRISHNAN: As the Chair pointed out moments ago, I made a presentation last year about the possibility of leveraging work from other health agencies. There are two things when we are expediting the process as Heather alluded to. And in this case, leveraging work could potentially also help expedite, but, you know, where feasible and appropriate. And we wanted to build upon the authoritative review conducted by other agencies and following evaluation. And also, we proposed, last time when I made the presentation, that we would combine the effort with other OEHHA initiatives, because the ethylene oxide was also reviewed Proposition 65 program at the same time as Hot Spots Program, because both programs developed the estimates using the animal studies during 1987-88.

So now, we put our efforts together satisfying the requirements of both programs effectively, you know,

producing a single work group and then essentially a single analysis of the data. So the starting point then was the -- as I presented last time, our starting point for the analysis for ethylene oxide was the U.S. EPA 216[SIC] assessment document. That was the primary source of studies or descriptions of studies published prior to our IUR development, and also all the studies published until 2016.

So our literature search then focused essentially since 2016 or since the EPA assessment. So our review focused on the period of January 2016 to January 2023 to identify the more recent studies for developing the IUR. But you will see that when we get to the review of the draft.

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DR. KRISHNAN: Just to give you an update of what happened. We released the document on the 7th of April, the draft, for public review, both the Hot Spots cancer IUR updated draft value as well as the proposed updated Proposition 65 NSRL, or no significant risk level, for ethylene oxide as well. So both of these values are based on the cancer potency derived from EPA's exposure response modeling, and calculated from the occupational epidemiological studies that I referred to moments ago.

So more -- what does it say that the revised

draft value -- what does it say and how does it compare to the previous ones?

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DR. KRISHNAN: So the more recent human data, as reviewed both by us as well as EPA, indicate that ethylene oxide is a more potent carcinogen than indicated by earlier animal data. And the updated draft cancer potency for ethylene oxide, based on human data, is about 38 times greater compared to the current IUR, which was derived in 1987 based on animal data.

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DR. KRISHNAN: I put the next three slides just to refer to some of the elements in the draft with no intention of getting into any of the details. The draft addresses and recognizes the endogenous production of ethylene oxide, because it is produced endogenously in individual and species. It contributes to the hemoglobin adduct levels as background level. And it summarizes the ethylene oxide genotoxicity. Once again, instead of reviewing the entire literature and presenting all of the individual studies, we refer to the reviews by the other agencies, in particular EPA and IARC, and then we have included descriptions of only the addition studies that have appeared since 2016, which are also consistent with the overall evidence or which asked to the overall

evidence. And our update is based on the EPA's exposure-response modeling or the analysis.

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DR. KRISHNAN: So instead of adopting the work conducted by EPA directly, we evaluated several other options as well in terms of modeling the data. And none of the other models would result in a better fit than the model selected and used by EPA, so -- and there's no new scientific information since 2016 that necessitated a change that -- the modeling or the derivation by U.S. EPA. So we concluded that EPA's exposure response model is the most appropriate one for estimating the cancer risks for ethylene oxide.

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DR. KRISHNAN: So in the draft, we present the adult exposure based ethylene oxide IUR as a review of 3.3 times 10 to the minus 3 for -- microgram per meter cubed. And it is for a combining the lymphoid cancer in males and females, as well as breast cancer in females for the two types. And the cancer slope factor or the inhalation unit risk, IUR, describes the excess cancer risk, that is the risk over and above the background risk associated with ethylene oxide. And the background risk would also include endogenous exposures. So the IUR that's derived is to estimate the excess cancer risk that will be over

and above the background risk, including the endogenous.

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DR. KRISHNAN: The public review draft was released on 7th of April, and the comment period ended on the 14th of June, day before yesterday. During this period, we conducted two public workshops, one in Northern California and one in Southern California. And we had one commenter in person in Sacramento and two in-person attendance in Diamond Bar. And since then, we have received written comments at the close of the public comment period on 14th of June. I received four written comments by email and OEHHA received, via our website, 11 written comments. There may be some overlap of submissions, but we're yet to have the information on it.

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DR. KRISHNAN: So in terms of next steps, we'll be -- we have -- we'll be reviewing the public comments, and we will develop a response to comments, and make appropriate changes to the draft document, and then bring the document -- the revised draft to the SRP for review. So hopefully at the next meeting that will be our expectation.

So that concludes my status update on ethylene oxide on the process of developing the document that I alluded to last time at the SRP.

Thank you.

CHAIRPERSON ANASTASIO: Great. Thank you Kannan.

So, Panel, any comments, mindful of the fact that we're going to see the full document at a future meeting, but are there any interim comments before we get to that point?

PANEL MEMBER MESSER: I guess I just have general, somewhat naive, question to help me understand how the -- these documents are used, given that my understanding Kannan is that there's an EPA standard that's already developed, is that right?

DR. KRISHNAN: Yes, a cancer slope factor yes.

PANEL MEMBER MESSER: How do -- how do our CARB standards relate to those EPA standards? Are they -- are they a California-specific standard that's independent or...

DR. KRISHNAN: Under the Hot Spots Program, we have the guidelines -- methodological guidelines of developing the values, both for cancer and non-cancer. There are some methodological differences in terms of what specific factors have applied. Like when you look at the non-cancer development, there's a sensitivity factor to protect children, for example, that can be up to a factor of 10 separately, as you saw earlier, in the TMB presentation, on trimethylbenzene this morning. So we use

our methodological approach and an independent analysis to be consistent with our guidelines.

PANEL MEMBER MESSER: And does that result that California guidelines are generally more stringent than EPA guidelines, is that a fair thing, or is it -- does it vary? Just -- it's just a general question to help me get the big -- the context here.

DR. KRISHNAN: Yeah. Maybe I would invite Vince to have a word on it.

DR. COGLIANO: Thank you very much. They do differ sometimes. Sometimes California and U.S. EPA standards differ because we've looked at the database at different times. The guidelines though that we have, though they're very consistent with each other, sometimes have some slight differences. Like on noncancer, this doesn't apply to ethylene oxide, our default inter -- intrahuman variability factor is 30, rather than 10, but the guidelines are generally very similar.

Now, in this case, there are some California programs that would give preference to an OEHHA value over a U.S. EPA value. And in this case, the OEHHA value was developed in the 1980s before these NIOSH studies became available about up -- eight to ten years ago. And it's really not a matter that we think that the value from the 1980s is better, so we did look at the U.S. EPA value very

carefully. We did a few sensitivity analyses and we determined that it certainly is a better value than the value on -- based on animal studies from the 1980s, and we don't want there to be any confusion that where OEHHA is insisting on 30- to 40-year old animal studies instead. So that's why we're proposing this update to the OEHHA value.

PANEL MEMBER MESSER: Thank you. That's very helpful context. So it's a case where there's an existing value, which has been superseded by a more stringent value at U.S. EPA, and it's -- it seems prudent to update the OEHHA value. That's my understanding.

DR. COGLIANO: It's been superseded, but I wouldn't say it's because it's more stringent.

PANEL MEMBER MESSER: Okay.

DR. COGLIANO: It's based on newer information and it's based on epidemiological studies, rather than laboratory animal studies. So that's the reason that we're -- we feel that it needs to be updated not necessarily because it's more stringent, though it is.

PANEL MEMBER MESSER: Thank you. Thank you that -- for that clarification. I guess a better way to put it is there is an appreciable difference.

DR. COGLIANO: Appreciable difference and a better basis for estimating human risks.

PANEL MEMBER MESSER: Thank you.

DR. KRISHNAN: And also maybe on the technical front, in terms of the cancer inhalation unit risk, there's a slight difference the way they are developed and usees between the EPA and OEHHA. Here, the age adjustment or the age sensitivity adjustment is done during risk characterization, whereas EPA does those adjustment up front. It may sound a bit technical, but -- so it's not the same. California-specific use is not the same as -- the way it's applied is a bit different.

PANEL MEMBER MESSER: So just one comment. Maybe this very detailed study can use as a test case or a model for the earlier project we were talking about for considering, you know, adoption or update of OEHHA values based on existing literature, since by doing this comparison, you'll have a very detailed understanding of the methodological differences. Maybe out of this could come a recommendation for interim values that might be adopted from EPA in the case when there aren't any OEHHA values. Just suggesting you might take this as a test case for the project we heard about prior to this of trying to find ways to provide a more rapid process for at least interim values. I don't know how clear I'm being.

DR. KRISHNAN: Um-hmm.

DR. COGLIANO: I think that's clear. And I think

this is actually an example of adapting a value by another health agency, in this case U.S. EPA, rather than doing all the work from scratch looking the epidemiology and developing numbers. U.S. EPA used models and we started with looking at those models and we did some sensitivity analysis on them, and determined that they were, we think, a good way to go for ethylene oxide.

So I think it would have taken us a lot longer if we were -- if there were no U.S. EPA value. If we were trying to use the NIOSH studies, that definitely would have taken us longer to develop in-house.

PANEL MEMBER MESSER: One last comment. I apologize for sort of going down this rabbit hole, but that sounds great. And maybe there could be a kind of meta-report documenting the time savings and helping establish a template for future studies or future adoptions, since this is being done with such care and such thought.

DR. COGLIANO: And that's a good comment. I think we will -- we'll look into doing that, and -- as a way of demonstrating that this expedited process of looking at other values in OEHHA, and other values by other health agencies can save us time instead of developing new values from scratch.

CHAIRPERSON ANASTASIO: Great. Thank you, Karen.

Any other Panel comments?

Okay. It doesn't appear that we have any more.

So we are at a crossroads. We have two options at this point. We can take our scheduled lunch break, which was going to be 45 minutes or we can power through and probably be done in about 30 minutes. So yes, Beate, do have a question or comment about that?

PANEL MEMBER RITZ: I have a comment, because I'm in Europe nine hours ahead. If you take a break, I don't think I can make it --

CHAIRPERSON ANASTASIO: You can't may it back.

PANEL MEMBER RITZ: -- because it's getting late.

CHAIRPERSON ANASTASIO: Yeah. Okay. So let me take a vote then of the panel. My motion is that we power forward and we try to get everything done continuously, and then your lunch is delayed, but then your afternoon is yours. If you're in favor, yeah, give me a thumbs up or raise your hand.

(Thumbs up).

(Hands raised).

CHAIRPERSON ANASTASIO: And okay, I also -- okay. So everybody wants to do that. I agree. And I just need to make sure though that our presenter is prepared. Brian, does that work for you?

Sorry, Brian. You're not muted, but I can't hear

you.

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE: Oh, you know what, my mic off. Sure. Now, I'm ready to go. Yeah.

CHAIRPERSON ANASTASIO: Okay. Fantastic. Okay. Then I am very happy to present or introduce rather our last item, number 6. So this is an update on the Community Air Protection Program. So you will remember that CARB staff from the Office of Community Air Protection, OCAP, they're going to update us on current activities focusing on this year's annual update to the Board and the update process for the statewide strategy, also known as the Program Blueprint.

In response to Assembly Bill, AB 617, CARB established a Community Air Protection Program, CAPP, or Program. The Program's focus is to reduce exposure in communities most impacted by air pollution. Communities around the state are working together to develop and implement new strategies to measure air pollution and reduce health impacts.

The Panel is one of several groups being consulted about the implementation of the program. And if you want more information about the Community Air Protection Program, you can go to their website. And for this item, the Panel will be accepting both oral and

written public comments.

So, Arash -- actually, Brian, before we get to your presentation, Arash is going to show an instruction slide about how to make a public oral comment.

Arash, are you with us?

There we are. Arash, can you explain this?

DR. MOHEGH: Sure. Sorry.

CHAIRPERSON ANASTASIO: That's okay.

DR. MOHEGH: So if you want to submit your oral comments, we are accepting oral comments on this item after Brian's presentation. So please kindly raise your hand. You can do it either using the reaction button on the menu that you see on the bottom of your Zoom application. There might be a raise hand, lower hand button directly there, so you don't have to go to the reaction button. And for those of us -- for those of you who are joining by dialing the number in via phone, you can dial star nine to raise your hand and we will -- after Brian's presentation, we'll activate your mic and you can provide your comments. The comment time for this item is about 10 minutes and we will adjust the number of time based on the number of commenters.

Thank you.

CHAIRPERSON ANASTASIO: Great. Thank you, Arash. So without further ado then, I'd like to introduce Dr.

Brian Moore, who is the Supervisor of Community Planning Section from CARB OCAP.

(Thereupon a slide presentation).

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

Thank you. And it's great to see you all again and I appreciate the chance to update you on our program.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

So this program update I'll just split it into two parts. The first will be on our annual program update, kind of looking backwards on what has been accomplished over the last year. And then the second half is going to be on our statewide strategy revision process. So we call that guidance document the Blueprint and we are developing draft versions of our second blueprint, Blueprint 2.0 right now.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

To give you a little idea of where are in the program. Oh, and again I should state I think I forwarded the links to Arash, but we have an annual report out that you all can take a look at and I can get it to you again, if you'd like to see it that is detailed information on progress over the past year.

But just from a high level, right now we have 19

communities that have been selected by the Program to develop emissions reduction programs or community air monitoring plans. And of those 19, 18, so almost all of them, are developing emission reduction programs. And then we have one that is just doing air monitoring.

As you can see from the list, they're located throughout the state. The right side of this figure shows where these communities -- these 18 communities that are developing these emissions reduction programs are in the process. So you can see that we have -- the big takeaway is we have seven that are entering their last year, their fourth year of implementation before they hit that five-year milestone, where we're going to really take a close look at how those programs are doing.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

From an incentive side of things, so our Program does get a sizable incentive budget to see this Program implemented, and get early emissions and exposure reductions. So the left side there shows money spent through November 2022 by sector in the Community Air Protection Program. So you can see, you know, on the on-road locomotive, marine vessels, there's some big investments, as well as off-road ag.

The one thing I did want to call attention to was

that top five million, it's labeled as community identified projects. These are actually incentive projects that were developed by the air districts partnering with community steering committee members, so community members in these communities came up with projects to address specific community concerns. And that's what that five million is there for community identified projects.

The right side of the slide looks at those incentive projects and it's estimating emissions due to that -- those expenditures. So you can see the way they're split up, we have the green or the teal color kind of showing the kind -- the emissions that we've seen or estimating to be reduced inside these 19 selected communities and the gray are emissions estimated to occur outside of these kind of officially selected communities for emissions reduction programs, but in other disadvantaged communities throughout the air districts.

So we average like around 35 percent of reductions are happening within the AB 617 communities. But part of these incentives, the point was to see early reductions throughout the state. So that's why we are also seeing those reductions in the gray bar -- in the gray section of those circles.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

So on the flip side to seeing emissions reductions, we also have a really robust variety of exposure reduction projects that have been implemented in these communities. And many of these have been -- taken advantage of that five million in community-identified project design. So an example would be like a school notification systems, either enhancing them, upgrading them, or making sure they continue. Residential and school air filtration projects have been really popular. And so these are -- these are types of projects that don't -- aren't captured in the emissions reduction estimates, right, because we're not really reducing emissions, but we are definitely reducing exposure, especially to sensitive populations, like school children.

Actually, in some of these, we do see emissions reductions like paving projects, you know, that retain dust -- road dust. We actually can estimate reductions with those types of projects as well.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

So now, I'm going to kind of shift gears. And this next section is about looking forward to how we're going to revise our statewide guidance. So on this slide, on left side, we have the three bills that are now in law

that kind of guide the Program, so that would be 617, which was the initial one. And actually AB 197 kind of calls back to Moira's presentation where that actually led to enhancing CARB's emissions inventories and what we're required to report from facilities on their emissions. So that data is rolling in as well and should help a lot with estimating exposure.

And then 1749, actually two main things. It happened extend if the air district, and community, and CARB will agree, the time required to create the emissions reduction ram. That was a big concern is that these community members and air districts had one year to meet up and develop an emissions reduction program, a CERP. And that just seemed to be too short. You know, you're meeting once a month. That's 12 meetings at the most. So the Legislature gave us an additional year if all parties agree. So that's 1749.

On all -- an action also for the larger air districts requires them to post their permitting for facilities, which has also been a data source that many community members have wanted and is very helpful. So that kind of helps on the transparency side that we'll see those permits posed.

And then this kind of indicates that, you know, we take those laws, and then our statewide strategy is

just implementation guidance. So CARB's attempt with air district and community partners to take these laws and make sure they happen. And we wrote the first guidance in September of 2018. And this September five years later, we're looking to revise that guidance.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

And we are doing that because the statute actually requires us to revise guidance every five years. So that would be this September. And a big part of that is just taking all the direction we've gotten over the last five years to try to improve the current components of the program as well as add some new components to help us reach more communities in a more resource efficient way. So this wheel here just shows in the dark blue the requirements and guidelines we've written for -- in our first 2018 guidance document blueprint. The light blue shows new sections that we have added, and those highlighted and kind of gold are three mechanisms or pathways that we are suggesting to leverage CARB resources to get benefits to more communities across the state that are in need, rather than this kind of official, you know, selecting communities, you know, one off, one, or two, or three every year. We want to be faster with rolling out benefits across the state.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

And this is just kind of a high level look at our funding. This is one of -- one of the drivers of trying to be more resource efficient and nimble with getting out emissions reduction strategies is that if you can see there the implementation funds that we get from the Legislature have been pretty flat since the inception of the Program. There was a bump that was very welcomed last year, where we got an extra 10 million from the Legislature to really get a couple communities up and running on their development process, but that was not continued. So we've been kind of flat funding and we're trying to reach more communities, so that's why we're trying to be a little more creative with how we're using our resources.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

So when we look in the revising our new draft guidance document, we really focusing on like these three points. One, we want to make sure that we recommit and finish off and improve the current process, which is just kind of selecting communities for a CERP and air monitoring development. You know, kind of our historical pathway. And we also want to affirm our commitment to

non-discrimination. Like we're required by federal and State law, right, to follow civil rights directions. So that's a part in this new Blueprint that is implicit in the first, but not explicitly written. So we thought that was extremely important, and we're told it was recent -- really important by our community members.

And we also want to also State CARB's commitment to equity in the way we rollout our regs and incentive programs. And then the final one there is to provide multiple pathways to get emissions reductions outside of the traditional CERP and CAMP pathways. That's that third point.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

The way we've structured this draft version of our -- our new version of our Blueprint, it's in two parts. And part one is actually available for public comment now. And if any of you are interested, I can pass it on as well. So that teal part outlines part one, which is basically a five-year strategic plan, so looking -- you know, what's our vision of how this program is going to change over the next five years, what's the mission of the Program, and how are we going to actually implement that vision.

Part two in the blue is more nuts and bolts

implementation. And we're kind of breaking that into two parts, the kind of conventional CERP and CAMP pathway, you know, how are we going to improve that process, and then also on the right side, we get into some of -- about three main new alternatives for communities to bring resources to clean up the air in their communities through new pathways, which I'll get into in a second.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE: And this slide kind of just breaks down those two -- those two blue goals from the one before on part two. So the top lighter blue one is the idea we really want to ensure that the CERPs that are out there and being developed are completed, right? And we're trying to rewrite guidance to make sure that we're getting valuable information from those CERPs and we're helping the air districts and the community -- and all actually State and local partners complete all the actions in those plans. So that's kind of our -- the top part of that figure.

And the bottom is this new pathways idea, where we really want to focus on other communities. We've had over 65 communities routinely apply for the Program and be nominated by air districts that we just have hot been able to bring into the kind of historical CERP and CAMP pathway. So we really want to focus ways we can bring

resources to these 65 communities, and a large part of the new Blueprint kind of details some ideas we have about that.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE: So when we look at that alternative pathway, we want to focus on those five -- those 65 communities. You can see them here. So the yellow dots are current, you know, CERP and CAMP communities and the blue dots represent these 65 consistently nominated communities around the state. So we really want to focus our resources on engagement with community members, looking at other new pathways to bring resources. And what we see, we see them right here, one is we wanted to look at pathways that CARB actually has some discretion over where we have some legislative authority.

So one is community air grants, which we can actually use to do a lot of work in these communities. Another is community-focused enforcement. We've been really successful or it looks like we are going to be in Del Amo down south and also in West Oakland. Our Enforcement Division is actually partnering with community members to develop community-focused enforcement plans. So that's something that we at CARB can do now.

And we also want to really partner with other

State agencies to help bring more resources when like there's concerns that maybe sit a little outside air pollution, whether it's land use or water, things like that. So that's one idea. And we are also looking to expand those CAPP incentives guidelines, so that they can be used more creatively by communities. So that's another thing we're doing right now is revising those CAPP incentive guidelines. So through the CAPP incentive guidelines, our community air grant program and through community-focused enforcement, those are three main, I guess you'd say, levers we're going to use to try to reach out to these 65 communities over the next five years.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE: And a timeline development for the Blueprint 2.0, so we're starting at the top there, June. This is where we're at now. We're going to release a draft version of the document and allow comment -- public comment on it before we even get to the final draft. So we're adding kind of a pre-step with receiving comment. And part one is that overall vision of Blueprint 2.0, the draft, is released, and ready, and we're receiving comment now.

We've opened up a public comment period, and starting in July, we're going to have a -- we're doing a lot of targeted outreach as well as workshops. So we have

three workshops planned over July. One will be actually delivered in Spanish, or Spanish -- monolingual Spanish speaking community members and that will go all through July. Then in August, we'll take all that feedback and direction from our public outreach, develop the final craft, and that will also be released again for comment in August with a public docket. And then in September, that is when we are planned -- late September around the 27th or 28th, that is when our CARB Board will meet to consider this new Blueprint 2.0, sorry, our updated guidance document. And there will also be space for public comment period at that Board meeting.

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OCAP COMMUNITY PLANNING SECTION MANAGER MOORE: And I think that is -- that's all I have, if there are any questions.

CHAIRPERSON ANASTASIO: Great. Thank you very much, Brian. Yeah, let's start with Panel questions and comments and then we'll get to public oral comments.

Panel members, any comments?

Ahmad, go ahead.

PANEL MEMBER BESARATINIA: Thank you, Cort. Thank you, Brian, for this overview. Very helpful. I have two questions. One is with regard to the community nomination. Can you let us know a little bit about the

process how we ensure that all communities get a fair share to be nominated and what are the determining factors there.

And the second thing with regard to school notification program. I was wondering what does it entail? What is the coverage of that program? Can you be a little bit more specific about that?

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

Sure. Sure. So the first part. The current nomination system is that CARB, we do a statewide assessment looking at communities throughout the state, using a bunch of resources, like the Healthy Places Index, CalEnviroScreen, the emissions data we have, so just look at the overall burden throughout the state. Also, communities and community-based organizations themselves will self-nominate for the Program. So they'll notify us and their local air district, as well as the local air district will also put forward communities they feel that are in need. So through a kind of quantitative assessment, emission burden, and then as well as more qualitative -- you know, do they have community groups that have the infrastructure and are ready to go to work with the air districts, does that air district have resources to implement the Program, things likes that. We develop a list of recommendations for communities.

And that -- and that process has been difficult and there's a competitive nature to it that is definite ideal, so that's why our plan over this next five years is to look a those 65 communities that have been consistently nominated for the Program and really focus on bringing resources to them. And that list isn't going to be static. As we get more communities interested in the program through outreach, we'll be adding to that list. And so that is -- that is -- that is the idea. We want to get away from this process of only nominating or being able to select, you know, two or three communities a year for this official development of these CERPs and CAMPs.

And about -- well, the second question was about the school flags program. I think that one specifically was happening down south. I can get you more information, but I think it detailed improving on the real-time data they were receiving for the flag program. And it's about like putting a notification, whether it's like LED boards around the school or using more traditional colored flags up a flag poll to let all students and faculty know when it's safe to be outside for physical activity and when kids should maybe be brought in for PE.

You know, so that -- that's the idea with those school flag programs. And there was funding before kind of inconsistently, but one community -- I don't want to

misspeak, but it was one in Southern California actually put together a flag project to make sure that their schools all had it up and running in a more current notification system.

PANEL MEMBER BESARATINIA: Thank you. It's very helpful. Just a quick note, is there any mechanism in place to reward communities who participate in this program successfully and excel at the end of this period, whatever year is required for this program, to reward them, kind of give them some incentives?

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

I'm not sure -- we haven't thought about anything at the end, but the hope is that when these communities come into the program, we're able to bring resources through incentives and enforcement mechanisms to them achieve their goals. And really the Air District should be partnering as well, so -- and that -- well, and that's one thing about our current incentive program, only communities that have been selected for a CERP are allowed to develop those specialized projects, the community-identified projects. One of our thoughts with revising our CAPP incentive guidelines is to allow more communities to take advantage of those types of projects, so we can see projects more tailored to the needs of the community.

Now, initially, the Program to get early benefits, we're like, hey, you have a program up and running, like heavy-duty truck replacement, you know, at the air strict, go ahead and use this money on those current programs, so we can get some really early emissions reductions. And now we're kind of tilting it back to the idea like, hey, what kind of community identified projects have we seen that are effective. Let's let more communities take advantage of those. So that's -- ad again, I want -- I want to emphasize, this is all -- these are all draft concepts. So over the next, you know, month and a half of public workshops, and interact with all our stakeholders, you know, we may see new ideas or tweaks to a lot of this, but that was definitely one place we at CARB thought we have -- we have the power to revise our incentive guidelines, so we're going to try to make them a little more open.

PANEL MEMBER BESARATINIA: Thanks very much. Very helpful.

CHAIRPERSON ANASTASIO: Great. Thank you, Ahmad, and Brian.

Joe.

Joe, you're muted.

PANEL MEMBER LANDOLPH: Yeah. Brian, it's a very nice program. It sounds like it's going very well. I

have two quick questions. One is are the communities getting good scientific input from toxicologists or cancer researchers as to what compounds should be gotten rid of, and if so, who can give this to -- who gives this to them? So why don't you deal with that one first. That's an easy one.

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

I'd say they'e getting alright advice. You know, it's just been Heather Bolstad that's been helping us out.

No, I'm kidding.

OEHHA is very involved with a lot of our communities, not only Heather's team, but we also have researchers like Lily Wu. And so OEHHA has been doing a lot of work with us to get that type of information in community members' hands. And we have tried to give really detailed -- it's a mix -- well, I want to keep this -- we have a lot of community members that are very well versed, right? And so that's, I guess, one of the challenges of the program, that know a lot of this stuff, and have been following the Air Toxics Program for a long time and would probably be great staff and management at CARB, right? And we have others that are -- that are new to it.

So through work with OEHHA and our Research Division at CARB, we try to create simple enough tools --

and the thing -- you may have all experienced this, you know, we make a simple tool, but they're like look at this outline case, or this kind of -- we end up caveating a lot of our tools to death sometimes, you know, but we have tried to develop toxic-weighted emissions tools that are available online to give an idea of a way to prioritize toxics. We try to get really community-focused and specific inventories, so they can see the major sources in their area. So there is that educational component at the beginning of the Program that air districts also participate in. And actually many -- I think it might be Stockton and some others have actually developed technical advisory committee, you know, so they've reached out to academics, and local experts, and maybe included toxicologists from air districts, and emission modelers to help advise the committee through a subcommittee -- a committee subcommittee.

PANEL MEMBER LANDOLPH: Okay. Thank you. And then the second one is do you have a list or can you refer off the top of your head to any compounds or substances that have come out and have been significantly reduced in the communities that you're proud of so far?

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

Well, from the criteria's perspective, we have seen some pretty appreciable PM reductions, you know, as

far as health impacts. And we've seen them on a range through these incentive programs. Especially if you don't count the exposure reduction ones, we see a pretty good return on investment on PM reductions. We also I wish I was better versed. I work mainly with Central Valley and Bay Area communities.

But I know in the south, they're really looking at a lot of metals with a lot of their strategies. Like the ethylene oxide, they'll be very interested in. You know, so that's something that's come up, but I can point you to -- we have a lot of tools that break down strategy by strategy the type of emission reductions we're getting. So I can forward this on to Arash to share with the group and you can look where we're at so far.

PANEL MEMBER LANDOLPH: Okay. Thank you very much.

CHAIRPERSON ANASTASIO: Great. Thank very much, Joe.

Any other Panel comments or questions?

I had a question for you, Brian, and it's related to something you said in your last comment. And the question is how do assess success?

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

So our plan -- well, this is the original plan. One of the ways we're streamlining and reporting is that

initially we did give guidance about how you would track -- you would track progress, right? And we want to really leave it really open so communities could really track things the way they wanted to. And air districts, and they all have very different sources of concern and different geography, which worked well. But then as looking at the Program as a whole was difficult to compare. Like we mentioned -- you mentioned early, like they had different units, they had different time spans, you know, five-year goals, lifetime reductions.

So it was very hard to take that kind holistic approach of how the Program was doing. So one of the big changes we're suggesting for this new round is that we're eliminating a lot of the reporting, but we want to report more on what's valuable. So we're -- we are suggesting strongly that every action that's taken in a CERP has its own target, you know, for their five-year milestone, and there's a unit of measure, so this is a measurable target, so that we can report on percent progress. So we can -- so the idea is that maybe we can't, you know, add up PM2.5 reductions for all the communities, because they're measuring differently, but we can at least say now we have at least a percent completion, right?

So then we will know that, hey, you have that target. You didn't hit it at five years. Well, now

you've hit that mark, now we're going to come up with a specific plan to how we're going to finish that, right? And a lot of these are living documents. Sometimes a community. A good example is a lot of communities have school air filtration measures and they put a lot of money to that and a lot of effort. But then with COVID relief and wildfire relief, a lot of these schools are getting new HVAC systems. So you'll see where these communities redirected that money to very popular like residential indoor air filtration, or lawn and garden trade-out programs.

So every year, in the end report, these communities with the air districts get to adjust. You know, the inform us on like where they're at then what changes they've made to their original plan. But our idea is that very simple, you have -- you have a target. It's measurable. You know, where are you in that?

So the idea is that by the end of the Program, whether it goes a little beyond five years, that you will -- there will be -- there will be rationale that the air district and community agree upon why action was not completed or there's a plan drawn out to get that action to completion is the plan.

So hopefully we'll be able to at least report back on like percent completed for every action and every

plan. And some plans 70, 80 actions. You know, we want to really be able to track them at an individual level. So I just -- last thing, our idea is that like if you have a plan, like you need to be able to know if you finish it, right? So if you -- if you -- if you develop an action, you should have a target and a way to track it or maybe that action hasn't been well developed enough, you know, to be -- to be included in the plan.

CHAIRPERSON ANASTASIO: Yeah, thank you. Any thoughts about health-based measures of outcome or changes, you know, hospital admissions, school absences?

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

So, yeah, I think there has been in -- we've seen the Bay Area take that route. I mean, I wouldn't argue, but just my work, I would say there's so much information linking like PM exposure to premature mortality, that that is a health-based measure, if we can reduce PM. You know, that's something we can measure, right, to -- and that's just my personal opinion. But also -- and then also, something like -- there has been, something like hospital based emissions to me isn't a health outcome. It's like kind of a health care utilization method. And so there's a lot of things that go into whether somebody goes to the ER for asthma, you know, and not related to asthma severity.

And so with things like that, we can track, but you've really got to do -- you would need to -- and if a community wants to do this, we've seen it, put money and resources into having a well controlled study that takes into account all the variables. You know, we had to -- we saw changes in asthma ED visits when the Affordable Care Act came out, because now more people were seeing primary care physicians and treating their asthma, you know, rather than having to go to the emergency room.

So we -- the community is very interested in health metrics. And the Bay Area is actually looking at -- one of their goals is to reduce cancer risk, so -- and that's more a mathematical process, right? So they are going -- they are looking at emissions and then atmospheric modeling, you know, and exposure to then estimate the reductions in cancer risk. But there is -- there is a ton of interest in better, more granular health care and health care utilization like data for sure. And actually, our Research Division has some research projects looking at that.

CHAIRPERSON ANASTASIO: Gotcha. That's great. Thank you.

Any other Panel comments?

All right. Seeing no more Panel comments, we're going to open it now to public oral comments. And I'm

going to rely on Arash here to tell me.

DR. MOHEGH: Yeah, I don't see any hand raised. We just checked it and it was working, so I don't think we have any comments.

CHAIRPERSON ANASTASIO: Okay.

DR. MOHEGH: I'm just going to put in the chat the link to --

CHAIRPERSON ANASTASIO: Oh, we do now have one, yes.

DR. MOHEGH: Okay. Let me turn on the clock. I'm going to set it for three minutes, since we have the one.

CHAIRPERSON ANASTASIO: Sure, that sounds good.

DR. MOHEGH: Um-hmm.

CHAIRPERSON ANASTASIO: And can you unmute --

DR. MOHEGH: Yeah.

CHAIRPERSON ANASTASIO: -- or allow -- yeah. And then Linus, you can unmute now and provide your comment.

LINUS FARIAS: Okay. Great. Thank you. I hope you can hear me. I'm Linus Farias. I am actually speaking on behalf of CCEEB, which is the California Council on Environmental and Economic Balance. We're a group that's worked on the AB 617 program for many years. And, you know, involved with a lot of the industries that are associated within -- some of them in AB 617

communities. And so I appreciate this presentation.

I had a couple of quick questions for Brian. One is in the slide you have statewide emissions reductions, you have masses in terms of tons of reduction of PM, NOx, and ROG. I wanted to find out if those numbers are total numbers, over what time, and what percentage of those -- does that represent the percentage reduction in these 617 communities or is it kind of a percentage of like is that a gross number there? That's one of my questions.

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

Got it. So, yeah, I should have explained that slide better. So those are estimated lifetime emission reductions of the projects funded with incentive funds from 2017 to November of 2022. And if you look at that slide -- I don't know if you have the PDF. I can't share my screen right now.

LINUS FARIAS: Yeah, I'm looking at it, yeah.

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE:

Okay. Yes, so those are lifetime emissions from those projects that are shown on the left side where we split up the money by source. And the percentages show that of those emissions, 30 -- like -- let's say like if we look at tons of PM, 36 percent of those emissions are happening within those 18 communities that so far have been selected through our traditional pathway in the

Program, and 64 percent are happening in that -- in the air districts and in other disadvantaged communities, but not officially selected ones. So it kind of gives you an idea of where that benefit is happening throughout the air districts.

LINUS FARIAS: Okay. So this is filtered by the actual just disadvantaged communities, that's the numbers for those, the reductions in all communities that occur?

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE: Right. Right. So it's all like -- and that's by the California State definition. So you're talking like SB 535, you know, and CalEnviroScreen definition of a disadvantaged community, you know, based on census tracts.

And if you want to, Linus, I think that Arash put it in there. It's the annual report link. It has more detailed information about the progress of the emission reductions over the last year. I think we break it out by air district in that -- in that report, so -- or you can email me too. Like I should drop my email -- I don't know if I can.

LINUS FARIAS: Yeah, it's in -- it's in the slide deck there. So that's great. I'll shoot you a message.

And quick thing in the 25 seconds here left, when do you anticipate the part two of the Blueprint document to be released?

OCAP COMMUNITY PLANNING SECTION MANAGER MOORE: I'm hoping really soon. It's under EO review. Our executive office has it, and what's this, the 16th? Hopefully in the next week. And I've already submitted the Spanish -- the version for Spanish translation. So we're happening to -- hoping to have both of those really soon. Probably the English version in a week and hopefully the Spanish version within 20 days.

LINUS FARIAS: Excellent. Thank you.

CHAIRPERSON ANASTASIO: Great. Thank you, Linus for your question. I'm looking. I don't see any other questions. So any members of the public, if you have any items, if there are any questions, please raised your hand.

DR. MOHEGH: I don't see any other and hand raised.

CHAIRPERSON ANASTASIO: Okay.

DR. MOHEGH: I'm just going to remind everyone that you can submit your written comments in the links that we provided earlier. I just reposted them in chat. You can find it in our website and also in the chat. And the portal is open until July 1st.

CHAIRPERSON ANASTASIO: Great. Thank you, Arash.

Alright, seeing no additional oral comments, we'll conclude that section, which bring us to our final

item, consideration of administrative matters. Any thoughts from the Panel? Anything that you didn't get a chance to say that you'd like to say now?

No. Okay. Great. Second, we do not yet have a next meeting planned, but we will be working on that hopefully soon to get that going.

Third, I'd like to thank James, our intrepid court reporter for all of his work behind the scenes.

And fourth, I'd like to thank Arash for really organizing all of this and running the meeting through Zoom. I appreciate all the work that you've done.

DR. MOHEGH: Thank you, Cort.

CHAIRPERSON ANASTASIO: And with that, I'm looking for a motion to adjourn.

I see none. Okay. Well, we'll go for another hour then.

(Laughter).

PANEL MEMBER BESARATINIA: Everybody is waiting for another one.

CHAIRPERSON ANASTASIO: Yeah.

PANEL MEMBER BLANC: I move to adjourn.

CHAIRPERSON ANASTASIO: Alright, let's vote. ALl in favor?

(Hands raised).

CHAIRPERSON ANASTASIO: Fantastic. The motion

passes. We will adjourn. Thank you very much panelists for all of your work. Beate, have a good night.

PANEL MEMBER RITZ: Thank you.

CHAIRPERSON ANASTASIO: And thanks to everyone for participating today.

(Thereupon the California Air Resources Board, Scientific Review Panel adjourned at 12:41 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing California Air Resources Board, Scientific Review Panel meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California;

That the said proceedings was taken before me, in shorthand writing, and was thereafter transcribed, under my direction, by computer-assisted transcription.

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 8th day of July, 2022.

JAMES F. PETERS, CSR
Certified Shorthand Reporter
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