CALIFORNIA ENVIRONMENTAL CONTAMINANT BIOMONITORING PROGRAM

(BIOMONITORING CALIFORNIA)

SCIENTIFIC GUIDANCE PANEL MEETING

CONVENED VIA WEBINAR BY: OFFICE OF ENVIRONMENTAL HEALTH

HAZARD ASSESSMENT

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE OF CALIFORNIA

FRIDAY, MARCH 25, 2022

1:00 P.M.

JAMES F. PETERS, CSR
CERTIFIED SHORTHAND REPORTER
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APPEARANCES

PANEL MEMBERS:

Carl Cranor, PhD, MSL

Lara Cushing, PhD, MPH

Oliver Fiehn, PhD

Eunha Hoh, PhD, MSES

Ulrike Luderer, MD, PhD

Thomas McKone, PhD

Penelope (Jenny) Quintana, PhD, MPH

José R. Suárez, MD, PhD, MPH

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT:

Dave Edwards, PhD, Chief Deputy Director

Cheryl Holzmeyer, PhD, Health Program Specialist, Safer Alternatives Assessment and Biomonitoring Section, Reproductive and Cancer Hazard Assessment Branch

Sara Hoover, MS, Chief, Safer Alternatives Assessment and Biomonitoring Section, Reproductive and Cancer Hazard Assessment Branch

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Kristi Morioka, JD, Senior Staff Counsel

APPEARANCES CONTINUED

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH:

Adam D'Amico, MPH,

Nerissa Wu, PhD, MPH, Chief, Exposure Assessment Section, Environmental Health Investigations Branch

ALSO PRESENT:

Stephen Brown, PhD, Sierra Club PFAS Grassroots Action Team

Nancy Buermeyer, Breast Cancer Prevention Partners

Jeff Esquivel

Avi Kar, Natural Resources Defense Council

Amy Kyle, PhD, University of California, Berkeley

Sharyle Patton, Commonweal

Renèe Sharp, Safer States

Ahimsa Porter Sumchai, MD, Hunters Point Biomonitoring Foundation

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PROCEEDINGS

DR. HOLZMEYER: And it's nearly 1:00 p.m., so I would like to introduce Dave Edwards, the Chief Deputy Director of OEHHA. Dave is stepping in for Vince Cogliano, OEHHA's Deputy Director for Scientific Programs who couldn't be here this afternoon.

DR. EDWARDS: Great. Thank you, Cheryl.

I would like to welcome everyone today, particularly the Panel and the audience to this meeting of the Scientific Guidance Panel for the California Environmental Bio -- Contaminant Biomonitoring Program, otherwise known as Biomonitoring California. Thank you all for participating and sharing your expertise.

Before we get into the summary of the November meeting, I'd like for you to join me in welcoming Lara Cushing, as the newest member of the SGP.

Great. Welcome, Lara.

Lara is an Assistant Professor of Environmental Health Sciences and the Fielding Presidential Chair in Health Equity at the University of California, Los Angeles. Her research focuses on patterns and health consequences of social inequities and exposures to environmental hazards in the United States. She's interested in analytical methods to characterize the joint effects of environmental and social stressors on health

that can inform efforts to reduce environmental health disparities.

Lara earned her MPH in epidemiology and PhD in energy and resources from the University of California, Berkeley.

Lara, now I'm going to administer the oath of office.

All right. I think if you would like, you can raise your right hand.

All right. I, Lara Cushing.

Oh, repeat that for me.

PANEL MEMBER CUSHING: I, Lara Cushing -- I had to unmute myself. There. I, Lara Cushing.

DR. EDWARDS: Do solemnly swear.

PANEL MEMBER CUSHING: Do solemnly swear.

DR. EDWARDS: That I will support and defend.

PANEL MEMBER CUSHING: That I will support and defend.

DR. EDWARDS: The Constitution of the United States and the Constitution of the State of California.

PANEL MEMBER CUSHING: The Constitution of the United States and the Constitution of the State of California.

DR. EDWARDS: Against all enemies foreign and domestic.

PANEL MEMBER CUSHING: Against all enemies foreign and domestic.

DR. EDWARDS: That I will bear true faith and allegiance.

PANEL MEMBER CUSHING: That I will bear true faith and allegiance.

DR. EDWARDS: To the Constitution of the United States and the Constitution of the State of California.

PANEL MEMBER CUSHING: To the Constitution of the United States and the Constitution of the State of California.

DR. EDWARDS: That I take this obligation freely.

PANEL MEMBER CUSHING: That I take this obligation freely.

DR. EDWARDS: Without any mental reservation or purpose of evasion.

PANEL MEMBER CUSHING: Without any mental reservation or purpose of evasion.

DR. EDWARDS: And that I will well and faithfully discharge.

PANEL MEMBER CUSHING: And that I will well and faithfully discharge.

PANEL MEMBER CUSHING: The duties upon which I am about to enter.

PANEL MEMBER CUSHING: The duties upon which I am

about to enter.

DR. EDWARDS: Great. Thank you. Congratulations and welcome to the --

PANEL MEMBER CUSHING: Thank you.

DR. EDWARDS: -- SGP panel.

All right. So now I'll jump to a recap from the November 8th meeting. So the meeting began with an update on the Program activities with the remainder of the meeting focused on perfluoroalkyl and polyfluoroalkyl substances, or PFASs, which included presentations from national and international experts. The afternoon discussion with the Panel, guest speakers, and the audience went deeper into PFAS biomonitoring to support exposure reduction efforts next steps. And discussion points on these topics included:

Identifying and evaluating determinants of PFAS exposures, such as diet, demographics, geography and other factors; the importance of determining the specific PFASs used in consumer products and other applications; looking at shifting market trends in PFASs driven by changes such as reformulation in consumer products or removal of PFASs from food contact materials, and then examining how that plays out in biomonitoring data; and then lastly, evaluating the impacts of regulatory and other efforts to reduce exposures by tracking trends of PFAS levels and

biological samples over relevant time periods.

The summary from this November meeting and the complete transcript have been posted on the November SGP meeting webpage on biomonitoring.ca.gov.

So since we are meeting virtually today, I would like to have the other SGP members introduce themselves. And so I will basically call everyone by name and then if they can just unmute themselves and introduce themselves to everyone else. So I'll start with Carl.

PANEL MEMBER CRANOR: Carl Cranor, distinguished professor of philosophy and faculty member in environmental toxicology at the University of California, Riverside.

DR. EDWARDS: Great, hi.

Oliver.

PANEL MEMBER FIEHN: Oliver Fiehn, not so distinguished, but full professor at UC Davis in the genome center. I'm doing mass spectrometry in environmental toxicology.

DR. EDWARDS: Great.

Eunha.

PANEL MEMBER HOH: Yes, I'm Eunha Hoh. I'm a professor of environmental health in the School of Public Health in San Diego State University.

DR. EDWARDS: Okay. Tom.

PANEL MEMBER McKONE: I'm Tom McKone. I'm a professor emeritus of environmental health sciences at the University of California, Berkeley. I'm also a retired affiliate at the Lawrence Berkeley National Laboratory.

DR. EDWARDS: Thank you.

And Jenny.

PANEL MEMBER QUINTANA: Hi. My name is Penelope Quintana or also known as Jenny. I'm a professor of public health at the School of Public Health at San Diego State University in environmental health.

Thank you.

DR. EDWARDS: All right. Thank you.

And José.

PANEL MEMBER SUÁREZ: Hi. José Suárez at the Herbert Wertheim School of Public Health at the University of California, San Diego. And welcome, Dr. Cushing, to the Scientific Guidance Panel.

DR. EDWARDS: All right. Thank you. And then lastly, Ulrike.

PANEL MEMBER LUDERER: Hi. I'm Ulrike Luderer. I'm a professor of environmental and occupational health at the University of California, Irvine.

DR. EDWARDS: Great. Well thank you, everyone. And thanks for joining us on this Friday afternoon. So now I'd -- I'll be handing it off to Ulrike who will

provide more details about today's meeting. Ulrike is stepping in for Meg Schwarzman, our -- the Chair of the SGP who could not be with us here this afternoon.

Ulrike.

PANEL MEMBER LUDERER: Thank you. Well, I'd also like to welcome Dr. Cushing to the Panel. And then --

(Phone ringing)

PANEL MEMBER LUDERER: I'm sorry. Sorry about that.

So the Panel goals for the meeting today are to first hear presentations with updates on Program activities, including AB 617 community biomonitoring studies and information to prompt a discussion of Program planning. And the primary goal of the meeting is to obtain the Panel's and the public's input on near-term and longer term Program priorities. We'll also hear a report back on the Buck et al. 2011 definition of perfluoroalkyl and polyfluoroalkyl substances or PFASs to follow up on our discussion at the November 2021 SGP meeting and to provide input on the next steps.

There will be time for Panel questions -- or questions from the Panel and the audience after each presentation. During the question periods after each talk speakers will remain unmuted with their webcams showing, so they can respond to questions from the Panel and

audience. And if SGP members wish to speak or ask a question, please raise your hand and I will call on you at the appropriate time and then you can unmute yourself to ask your question to provide -- or to provide your comments.

If webinar attendees have questions or comments during the question periods after each talk, you can submit -- submit them via the Q&A feature of Zoom webinar or by email to biomonitoring@oehha.ca.gov. We'll not be using the chat function during the meeting. Please keep your comments brief and focused on the items under discussion. Relevant comments will be read aloud and paraphrased when necessary. If webinar attendees wish to speak during the public comments period and discussion sessions, please use the raise hand feature in Zoom Webinar and I'll call on you at the appropriate time.

Now, I'd like to introduce Nerissa Wu. Nerissa Wu is Chief of the Exposure Assessment Section in the Environmental Health Investigations Branch at the California Department of Public Health, or CDPH, and the overall lead for Biomonitoring California. She will give an update on current Program activities and provide information related to future planning.

Nerissa.

(Thereupon a slide presentation.)

DR. WU: Good afternoon, everybody. Can you hear me?

(Heads nodding)

DR. WU: Everyone is okay. All right.

Let me get my slides up.

Alrighty. Well, good afternoon, everyone, and welcome to Dr. Cushing. Really looking forward to having your expertise on our Panel. I am going to be giving some administrative updates today and then I'll talk briefly about the CARE Study, giving you a status update, but I'm going to spend most of my time focusing on future Program directions what's coming for the Program.

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DR. WU: So this has been a transitional time for us in that we are growing. We're almost doubling our staff, thanks to the budget increase that we were provided starting in July 2021. So a lot our effort over the past months has gone into planning what that's going to look like and doing a lot of the administrative tasks necessary to manage this new budget and bring in new staff.

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DR. WU: And speaking of staff, we do have one staff update to report. Shoba, who has been such a big part of this Program - she's presented multiple times in this forum - will be leaving the Program in April.

Congratulations to Shoba for your new position and thank you for all of your hard work, but we will really miss you a lot at Biomonitoring California.

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DR. WU: So on the CARE front, this is the California Regional Exposures Study. We have been immersed in finalizing our report, which will provide detailed results, and demographic trends and comparisons between CARE-LA and Region 2. And we hope to have this report released in the coming months.

And as part of the work with CARE, we've been thinking a lot about the methodology and the feasibility of getting back into the field where we left off. But given the difficulties of conducting CARE and the limits to the design as implemented for Regions 1 through 3, we have come to the conclusion definitively that we will not be continuing CARE.

So part of the transition at this time period is to think a lot about what worked with CARE and what can and can't be learned from the CARE design, and then how to best design studies going forward to the future to meet our Program goals.

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DR. WU: So part of that has been thinking a lot about what are our Program priorities. And this slide

summarizes the discussion we had last July with this Panel about Program priorities. These are the top thing -- top items that came out of that discussion: mitigation of environmental health inequities, conducting intervention studies to identify impacts of public policy and mitigation strategies, evaluation of exposures associated with climate change, utilization of non-targeted screening to identify new exposures of concern, and conducting meaningful surveillance within Program resources.

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DR. WU: We've had input from other stakeholders as well, partly through our environmental justice listening sessions, but also through stakeholders who have attended these meetings and have communicated with us through other forums. And there are some similar themes between these and the last slide.

Environmental justice and equity work: conducting surveillance to identify inequities, building community capacity, designing studies that lead to policies that reduce exposures, as well as conducting community focused and community-based participatory studies, monitoring of temporal trends, and including more studies -- more chemicals in studies and thinking about the synergisms between chemicals.

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DR. WU: We also have our own Program values, and some of those are reflected in our founding legislation. So I've taken the inputs from all of these different sources and kind of categorized them into buckets as their themes are related.

There's surveillance, our evaluation of the presence of chemicals in a representative sample of Californians, which of course is one of our primary mandates. Looking at temporal trends as they relate both to the evaluation of policy and changes in our environment, which might be climate change - there are other changes to our environment which might be evaluated - identify highly exposed communities, evaluate strategies for exposure reduction, and expand the reach and sustainability of the program.

So we will come back to this list, but keep these goals in mind as we go through these two presentations.

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DR. WU: So one of the things we've been thinking about a lot and we have talked about it some here is how we, as a Program, can use our resources and our unique reach as a State program most efficiently. And in the past, our studies have mostly involved -- we've been involved at every stage, from study design to field work - actually going out and collecting samples - conducting the

field -- the laboratory analysis, running results return, doing statistical analysis, and then eventual release of findings through publications and presentations. And each one of these steps takes considerable effort. They're very resource intensive, which has meant, among other things, that we don't always get our data out as efficiently as we would like.

So one focus of the Program going forward is finding ways that we can partner with others to use that expertise and our status as a State program to maximize our effectiveness and our sustainability. So, for example, we've talked about utilizing previously collected samples as a way to be more efficient than conducting field work. We can collaborate with those others who might be in the field collecting samples already and add biomonitoring to those studies.

Our labs are already doing a great job of providing laboratory services on other studies. And as additional chemicals of concern are designated or as we expand chemical panels on a study, we should be working with State programs -- other State programs to see how we can share methodology and also State capacity.

We do provide a lot of technical support to other State programmers -- State programs and other researchers. And there has been a lot of discussion with CDC and the

National Biomonitoring Network about designing tools that all State programs can access, so things like participant management tools, and questionnaires. And I really hope this is an initiative that comes to fruition, because all State programs are really struggling with similar issues, how to run these very complex programs with limited resources.

And then there's also working with collaborators on data analysis to help us get our data out. And this is something that we talked a little bit about at our last meeting.

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DR. WU: So as follow up to that, we've put some thought, with the help of Dr. Suárez, into what information potential collaborators might want to have when considering taking on a project to look at Biomonitoring California data.

So as a starting point, we have assembled all the information from our studies, including when samples were collected, how many participants were in the studies, and the panel of analytes that were measured. And this is information that's already on our website, but we're organizing it in a way so that it's easier for somebody potentially looking for a project to see it all together.

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DR. WU: And we're working on a data package for each study that will include the kind of information that you might want to know when embarking on a study, things like study design, and how participants were recruited or selected, the total N per panel, which is not always the same as the N of the participants in the study, and then a summary of work that's already been done to date. Have we posted summary statistics? Have we looked at differences by demographics? Have we looked at the exposure questions? And then we have information on the questionnaires themselves, the overall topic areas, things like housing, or dietary habits, or occupation, the questions that we ask, and the distributions of responses.

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DR. WU: So this is an example from CARE-2, which had 359 participants overall and these are a few of the questions that we asked related to housing. How long have you lived in your current home? When was your house or apartment built? Is there a wall-to-wall carpeting in any room of your house? Are any of your carpets or rugs stain resistant or water resistant?

So we'll provide the number of participants who have provided information, so not including the don't knows or prefer not to answer responses, and you can see the distribution of responses. So, for example, if you're

thinking of looking at PFAS levels and whether somebody had carpets or rugs in their homes, you'd be able to look at this, and this will help potential collaborators determine if there is a study question that they might want to investigate using our data set.

So the preparation of these materials, first of all, will take a little time for us to get all this together, but it doesn't mean that we are stepping back from doing our own analyses. We have a really great team of epidemiologists and they will continue to do their own work and also work in partnership with external collaborators. But with everything we're trying to do and the amount of data that we've accumulated, we're just not going to get to this data ourselves. And it doesn't make sense for us to hold it back and not share it with others.

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DR. WU: So when we get to the discussion portion of this talk, there are two things I'd like your input on. If you were considering using this data for a project or you have a student or collaborator who might want to do so, what other information would you want to have included in this data package?

And second, I think it's really important to make this data resource broadly available to people beyond our normal collaborators and people who already know about the

program. So do you have suggestions about how to go make -- how to go about making this data more widely available and more visible to other researchers.

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DR. WU: For surveillance work, as mentioned, we have considered the limitations of study design, even given our larger budget, and we have decided not to return to the model of the California Regional Exposure Study, in large part, because it was so difficult getting a representative sample and because the pace at which we would have to cover regions in order to allow for temporal trend analysis or geographic comparisons was really just not feasible.

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DR. WU: So instead, we're planning to work with samples from the Genetic Disease Screening Program, or GDSP, to look at PFAS and other exposures in the population of pregnant women. And this will allow us to obtain samples at lower cost, but there's also a flexibility with these samples. For example, if there is another COVID surge, these are samples that we will still be able to access, which might not be the case with field work.

So the use of GDSP samples will allow us to really focus on the issue of time trends for PFAS and

other exposures. Our labs will be able to analyze about 500 samples per year for PFAS. And we do expect that a subset of the samples will also be available for additional analyses. So example -- for example, we have talked in our previous meetings about organic fluorine. We've talked about semi-targeted screening. And we might be able to use these samples to screen for classes of compounds or to think about chemicals of emerging concern.

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DR. WU: So just a reminder of what GDSP does, so you know what the sample pool represents. Prenatal screening is offered to all pregnant women in California, at their first prenatal visit and screening is a combination of blood draws, both in the first and second trimester and an ultrasound measurement. Currently, about 60 to 70 percent of pregnant women of California participate in the State program.

Newborn screening is also provided at the State. Almost all newborn babies are tested for metabolic disorders and other conditions using a dried blood spot, which is collected on filter paper by a heel stick that's implemented during the first couple days of life.

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DR. WU: Once prenatal screening is completed, the samples are generally discarded, but samples from

Fresno, Kern, Kings, Madera, Tulare, Orange, and San Diego counties, the Biobank counties, they are saved in the GDSP Biobank. So counties from these -- samples from these counties are split, one part, one aliquot, is reserved as an archive and the other is made available to researchers. So it's about 0.5 ml aliquot. Biobank samples have been archived over time, so we have the ability to go back in time as well as forward and look at a broad swath of the time trend.

We have also been able to obtain non-Biobank samples from GDSP in the past. So that gives us the ability to look beyond our seven counties, look across the State, and because they're not archived, we have a larger sample, or about 1 milliliter available to us. But because they're not archived, they're also not available from the past, and so that time trend work can only look into the future.

There are some samples that are not available. I think Kaiser patients are not part of the Biobank and samples linked to genetic disease cases are also not available, unless your research is specifically linked to that genetic disease.

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DR. WU: So thinking back to the goals of the program that we talked about earlier, the GDSP samples can

help us address a number of these goals. It is a population-based sample for a very specific population. And while there are some populations that are less represented in the State program, the GDSP program has very, very broad coverage, so it provides an opportunity to us to do sampling for surveillance.

Depending on how we decide to sample from the Biobank, we can really look at time trends in PFAS and other exposures, and we can address equity issues through comparison of biomarker levels by race, by Medi-Cal status, by zip code, or by distance from exposure sources. And, of course, these samples do offer us a unique opportunity to use semi-targeted screening.

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DR. WU: The drawback of Biobank samples are that it's only a serum sample and so we can't do urinary analytes or whole blood analytes. And for metals, there's the additional problem that the serum separator gel in the tubes has a trace level of metals that we can't correct for. So we are limited in a number of analytes we can run. We also don't have contact with the participants and so we don't have an opportunity to collect additional behavioral information or exposure information.

We can't conduct results return or interact with participants in the way the Program has traditionally

done. So I think one of the challenges, considering our primary goals, is to think about ways that we can address our goals by maybe changing the way we've always done things. So, for example, we can't do individual results return with these samples, but maybe there are ways that we can partner with health care providers and take what we learned from these studies to conduct outreach and education to prenatal clients or people thinking about starting a family.

And while we can't conduct community based participatory research with GDSP samples, there may be ways that we can sample in a particular way and use semi-targeted screening to assess overall exposures and compare communities.

The other opportunity that this may give us is that given that Biobank samples are relatively easy to obtain, we hope that it will enable us to conduct additional smaller studies that can be designed around meeting some of the goals that are not addressed by GDSP samples.

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DR. WU: So in the history of the Program, we have usually had multiple samples -- we -- multiple studies overlapping at different phases. And you can see from this table that I've sort of organized our studies by

the different goals that they address, that we've done a pretty good job of matching our studies to our Program goals.

This is true for the -- for the studies that we have in planning right now including Biobank, which is labeled here as Expanded MAMAS, and BiomSPHERE and the AB 617 projects that you'll hear about next. But we want to make sure that going forward, and particularly for these additional studies that we want to take on, that we -- that we select them in a way that will address our wide range of goals and we would like your input on how best to do this, whether it's to issue a Request for Information, or solicit input in some other way for types of new projects. And then there's a question of how we would evaluate new projects, how do we go about selecting new projects.

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DR. WU: So for the discussion we have three areas of input that we'd like to get from you.

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DR. WU: One is related to expanding collaborations for data analyses. Again, what other information would you want to have included in the data package and how can we broaden our collaborations and make this information more widely available?

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DR. WU: For the GDSP projects, we'd like to hear from you about how we should focus that sampling. Should we focus on the Biobank counties where the samples are only available from these seven counties, but we have the ability to look into the past as well as the future, and it is a smaller sample, or should we be focusing on the non-Biobank counties which allow us a broader look across California, a larger sample size, but the time trends only go forward?

Because we have limits to how many samples we can analyze for PFAS each year, we want to be thoughtful about how we design that sample. And I'm talking about this from a surveillance focus, but I do want to mention that last time we met, we did talk about PFAS in Orange County and it came up that Orange County had introduced new water treatment in 2020 to reduce PFAS in drinking water.

So as we're planning surveillance, there may be an opportunity for us to nest an intervention study at a community level, for example comparing the rate of decline of PFAS in Orange County to another county where they don't have a similar water treatment system.

Another thing to think about with our surveillance data collected is how that data might complement or be complemented by other efforts to capture

PFAS information in the state.

The U.C. Irvine study of PFAS in health, led by Scott Bartell and others, has started recruiting participants. So there will be another pool of PFAS exposure information coming from Orange County. And there might be ways that our surveillance work can -- can interact with that.

We also want to make sure our Biobank projects address Program goals. So one of the questions for this Panel was to ask your input on ways that we might be able to sample, or analyze data, or communicate results in ways that address our goals. And again, the examples I gave earlier are things like working with health care providers to communicate results out, since we won't have the ability to do individual results return, or working at a community comparison level by selecting samples in a way so that we can look at total exposures for communities.

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DR. WU: Finally, and these are questions that will be a topic for discussion for both this presentation as well as the upcoming presentation from Susan, as well as our overall discussion, if we do have capacity to take on additional projects, how are ways that we can identify potential collaborators across the state, how can we solicit input into what those projects might be, and which

program goals are most important for to us consider, how do we turn this into a rubric for evaluating potential projects.

And with that, I'll end and open it up for questions.

PANEL MEMBER LUDERER: Okay. Thank you very much, Nerissa. So now we have time allotted for Panel and audience questions. And please check -- I wanted to check with Cheryl if there have been any questions received via Zoom webinar Q&A or via email?

DR. HOLZMEYER: Yes. There's a question in the Q&A. I don't know if you can see it. It says, "Following up from last spring's meeting, do you believe these samples will be used to monitor quaternary ammonium compounds, QACs?"

DR. WU: We do not have currently -- oh, which samples? I'm sorry. Could you clarify if you're talking about Biobank samples or CARE samples? Is this with regard to Biobank?

DR. HOLZMEYER: This question came in during your talk, so I believe -- if the person who asked this question in Q&A could maybe -- Biobank.

DR. WU: Oh, Biobank. It's only a serum sample. And thus far, we have only run trials of QACs for urine -- oh, I'm sorry. I'm getting a chat that somebody else is

going to answer the question. Anyway, so the Biobank samples are only serum and we have only done trials in urine and fecal samples. So I don't think we are ready to run these with QACs. However, maybe June-Soo is on the line, I don't know if that's something that's possible through semi-targeted screening.

PANEL MEMBER LUDERER: It looks like maybe not.

MS. HOOVER: Yeah. Ulrike, I would suggest you take Panel -- Panel questions.

PANEL MEMBER LUDERER: Yeah, I will do that. All right.

MS. HOOVER: And just to clarify for everyone, the discussion questions Nerissa posed will be covered in the upcoming one-hour discussion session, so you can keep it to clarifying questions at this stage.

PANEL MEMBER LUDERER: Great. Thank you. I see that Tom has his hand raised.

Tom.

PANEL MEMBER McKONE: Yeah. This is kind of a quick clarifying question, and I think I have other issues, but I'll hold those to our broader discussion. But I was just -- in the CARE's project when you were looking at the survey and I think more broadly, one of the things I don't know if we've focused on about people's time activity budgets is how much time they spend in

transportation, particularly in automobiles and cars. And there's some emerging information about the chemicals that are used in automobiles, particularly flame retardants, the number of flame retardants apparently are showing up and have been in automobiles and without much fanfare or notice.

And, I mean, the other thing is that there are some very high roadway exposures to people actually in automobiles. I mean, we measure a lot of near roadway exposures to communities that are near highways, but the people on the roadways. So again, it may not be a big contributor, but it might be useful at some point either to go back and see if we have anything that relates to the amount of time people spend in transportation, particularly automobiles, or in the future maybe think about whether we want to collect more time activity data related to transportation.

DR. WU: Um-hmm. We did have -- so CARE had two surveys, one was sort of long term behavioral habits and one was collected right before -- one was filled out right before the sample was collected. And that second survey did have some information on it about time in vehicle. Let me see if Adam could respond to this question though, because he's most familiar with how it was asked.

Adam, can you -- can you chime in on this?

MR. D'AMICO: I'm going to have to pull up the survey in a minute to answer that question.

PANEL MEMBER LUDERER: Okay. Thank you. José, you have a question as well or a comment.

PANEL MEMBER SUÁREZ: Yeah, a comment. And I'll keep it brief and we can discuss more about it, but I wanted to congratulate you for the great job at updating the website to make it more easy -- easier to find all these different things. I really like the structure of this. I really enjoyed the tabs seeing there -- the projects tab within which you can see all the different structures within that. We can talk a little bit about -- like little tweaks here and there to make it even more visible. But overall, congratulations. I think it's very -- it makes it very easy. Once you get into what project, you can see which chemicals and -- are being measured, et cetera.

One thing, since you were asking one of the pieces that could also be of benefit here, is adding one specific icon on top that may be for researchers. A lot of times researchers want it -- you know, they have a limited amount of time. They want to make it very easy to see that. And if there's a tab just like we have there where it says projects, chemical, results, there's one that says for researchers, in which they could click on

that and they get -- they're able to download data, if you -- if you want to have some of that data available.

And that would be the next comment, whether you want to have -- what type of data you would like to have it downloadable versus which ones you would want researchers to request access to. Of course, it's always a barrier every time somebody has to request some -- something, it becomes a barrier, but at the same time, then you know a little bit more who's getting what. But it's something that, of course, you would need to discuss a little more internally, but I think that would also help with this interaction with other people.

DR. WU: Thanks. And the website is run by OEHHA, so all congratulations and suggestions go over to the OEHHA staff. And there is a lot of website work being done right now. And one of those conversations is how to make the data available once we -- once we complete working on these data packages how we can post them online.

PANEL MEMBER LUDERER: Thank you.

Carl, I see you have your hand raised as well.

PANEL MEMBER CRANOR: Just a quick question. I know the -- I see that the budget is up. Is that permanent money if -- to the extent money can be permanent? It does look like it's a better time for the

Biomonitoring Program. And the Governor is trumpeting that California has a lot of money now, so I'm just wondering how you see things.

DR. WU: Well, the budget is -- it is general fund, so not tied to a special fund, and it is in our budget as, you know, a permanent budget item. Nothing is ever really permanent in the budget, but as far as we can tell, it is long-term funding, which is wonderful. It allows us to do much more planning, assuming that we'll have this resource available to us.

PANEL MEMBER LUDERER: Thank you. That is great news. And I don't see any other hands raised at the moment. So I think --

MS. HOOVER: Ulrike this is Sara.

PANEL MEMBER LUDERER: Yeah. Yeah.

MS. HOOVER: There are hands raised. Lara and Carl both have their hands raised up.

PANEL MEMBER LUDERER: Oh. Oh, Carl, do you have -- well, I'm sorry, I did not see Lara. Lara.

MS. HOOVER: Oh, just -- Carl, is your hand up from before?

PANEL MEMBER LUDERER: And I think José also. If you have another --

MS. HOOVER: If you guys could lower your hands. Oh, no, José has another question.

Sorry, back to you.

PANEL MEMBER LUDERER: Okay. All right. Well, let's start with Lara.

DR. WU: All right. Could I -- could I respond to Tom's questions, first, because Adam has just sent me this.

PANEL MEMBER LUDERER: Oh. Oh, okay.

DR. WU: So we do ask in the past three days approximately how much time have you spent in a vehicle on a freeway. So it's very specific towards the 1-nitropyrene analyses that we were doing for CARE-2. And it's a reflection of a very short time period. It's not like they're overall habits. So depending on which analytes you are interested in, it would -- it would or would not be helpful.

PANEL MEMBER LUDERER: Thank you. Now, Lara, you have a comment.

PANEL MEMBER CUSHING: Yeah. Thank you. I had a quick question about the Biobank samples. It seems like a great resource and an exciting direction to go. And it looked like from your presentation that the type of information available is race, Medi-Cal status, maybe residential address or something like that.

Are -- is there -- so two questions. Is there -- is there anything else in those records about the person

who gave the sample and is there any ability to link to other administrative health data sets by Social Security number or something like that?

DR. WU: So within the prenatal screening, there is some limited demographic available -- demographic information available about the mom. There's her race, whether or not she has Medi-Cal for insurance, her gestational age, her last weight before the sample was taken. I'm trying to think of what else there is. And then we could get her residential address, but researchers do sometimes link prenatal to newborn records and then to outcomes databases like vital statistics. And in that way, we could get much more information on the sample. It is a more onerous process to get that information, but would open up this whole world of being able to do like birth outcomes and subsequent health assessments.

PANEL MEMBER LUDERER: Thank you.

José, you had another comment or question?

PANEL MEMBER SUÁREZ: Yeah. I have a few, but I'll just keep it short, since we're talking about the Biobank. GDSP, of course, is also within the California Department of Public Health, as are you, and so then you could -- I mean, I think it would be fantastic if people, participants, in general, who I guess will people who are getting screened would have the opportunity to opt in to

be part of different types of research. I know it's not in the part of -- it's not in mandate for the GDSP.

However, this would allow you -- us to obtain a lot of other information, especially the ones that you would have been able to collect with CARE. But now that that's starting to be phased out, you might be able to tap into that. Of course, this kind of involves having conversations at a higher level, but this might be something that could be of interesting to G -- to GDSP in a partnership with California Biomonitoring to start including the option of people being contacted to ask an additional set of questions, that otherwise you would have asked through the CARE, but now you're going to save yourself a lot of, you know, effort and funding by not having to do that with something that still could be very, very representative to some way, right?

Of course, we know that people that opt in to research tend to be a little bit different than those who don't even read the question or who don't want to be a part of that. So it sounds like Sara has a response.

MS. HOOVER: I'm just going to suggest that we move on, save this for the discussion, and finish up the question session.

PANEL MEMBER LUDERER: Okay. So then we will do that. So the next -- next, we're going to have a

presentation --

MS. HOOVER: Oh, sorry. Sorry, Ulrike.

PANEL MEMBER LUDERER: Yes.

MS. HOOVER: This is Sara again. I meant you can call for any last questions.

PANEL MEMBER LUDERER: Okay.

MS. HOOVER: I didn't mean to cut off that conversation. We actually are five minutes early --

PANEL MEMBER LUDERER: Okay.

MS. HOOVER: -- but I just wanted to clarify that we want to hold José's topic for later --

PANEL MEMBER LUDERER: Okay. All right.

MS. HOOVER: -- to get into those sorts of details rather than going too far.

PANEL MEMBER LUDERER: All right.

MS. HOOVER: But Nerissa, if you had a response or anything like that, if you wanted to say --

DR. WU: Sure.

MS. HOOVER: -- then go for it.

DR. WU: Sure. So participants actually don't opt in to having their -- their samples saved and biobanked. They have to opt out of it. And so I think changing that -- that administrative approach would be -- it's a huge lift from GDSP's perspective. I do think there are ways that we can partner with the Center for

Family Health, which is where GDSP sits. And one of the things that we've been talking about internally is maybe briefing that center and demonstrating the strong link between the work we do and their interest and their clients. And so I think that is a really -- a great direction to go in.

PANEL MEMBER SUÁREZ: Opting out is way better than opting in for these types of things so, yes. Great.

DR. WU: Yeah.

PANEL MEMBER LUDERER: All right. Any other questions before we go on to the next topic?

I don't see any in the Q&A or the chat. All right. Then I think we can go on to our next talk, which is going to be a talk by Susan Hurley. Susan is a Research Scientist in the Safer Alternatives Assessment and Biomonitoring Section of OEHHA. And Susan is going to provide us with an update on current community biomonitoring studies and information to help frame a discussion of upcoming priorities.

Susan.

(Thereupon a slide presentation.)

MS. HURLEY: All right. Thank you. Let me share my screen. Okay. So let me just start with letting you know what I'll be talking about today. I'll start with some brief updates, or maybe not so brief, updates on the

two projects that we are currently conducting to support the goals of AB 617. And then the second part of my presentation will focus on planning for future community biomonitoring studies, and laying out the foundation for the discussion we'd like to have afterwards.

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MS. HURLEY: So the first study that I'd like to talk about is the Stockton Air Pollution Exposure Project. This is -- the goals of this study are to learn more about air pollution exposures to school children in Stockton and to evaluate the effectiveness of school air filtration at reducing children's air pollution exposures.

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MS. HURLEY: So we completed the field work in December of last year for this study. We conducted it at All Saints Academy in Stockton, which is a small parochial school that is located in Stockton. You -- for those of you who have been to prior meetings and have heard our updates over the last year or so, as we've been struggling to develop it and figure out how to implement, while you know in the middle of the pandemic, you know, we've encountered a lot of challenges. At one point, we were actually worried it might not happen at all. But last November, our community partner at Little Manila Rising put us in contact with the Principal at All Saints Academy

who agreed to conduct the study at her school.

And All Saints Academy, although much smaller of a school than we had, you know, really planned for turned out to be a great community partner. The principal Noehmi Jauregui and -- was just super supportive of the study as were the families in the school and the staff. They really were super helpful at getting the study up and running quickly.

Ultimately, we enrolled 18 parent-child pairs. The child participants provided urine samples before and after school -- after one school day on two consecutive weeks in December. The parent participants helped the kids collect the urine and also completed two online surveys. Ultimately, we collected 75 urine samples that were sent to the lab for analyses, for metabolites of selected polycyclic aromatic hydrocarbons, PAHs, and volatile organic compounds, VOCs, as well as biomarkers of oxidative stress, and inflammation. We also are having cotinine measured as a indicator of tobacco exposures.

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MS. HURLEY: So in order to complement and help interpret the biomonitoring results from the urine samples, we also set up numerous air monitoring and sampling equipment throughout the school. These -- so we collected information on fine particulate matter, black

carbon, PAHs, VOCs, and we did some sampling for particle sources analysis. And these were set up in the classrooms as well as in two outdoor locations on the school grounds.

And all of this equipment -- you know, we set it up right before the sampling. We took it down when we were done with the sampling, with the exception of the PurpleAir monitors which measure PM2.5. Those are continuing. They are con -- they're still set up and are continuing to run, and will provide data on PM2.5.

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MS. HURLEY: We also set up stand-alone air filtration units in two of the classrooms during week one, so that half of the student participants for whom we had the complementary air data were in classrooms with the stand-alone filtration units and the other half were in classrooms without the stand-alone filtration units.

And then during the second week, we set up an -- the air filtration in an additional four classrooms. And these -- these IQAir filtration units, they're the IQAir Pro Plus. They're primarily designed to filter particles, but they do also filter for VOCs.

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MS. HURLEY: Now, I know this -- this -- this is a complicated slide. Don't worry about all the details. It's a schematic showing the location of the student

participants, the air filtration units, as well as the indoor air sampling and monitoring that we had set up during week 1. And I'm really only showing it just to give you a flavor for all the different devices that we set up, and really the richness of the air quality data that we collected, which will really help us in interpreting our biomonitoring results.

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MS. HURLEY: And so this is the sampling -- the set-up for the week two. It's essentially the same other than we set up some additional sampling for VOCs and set up those additional air filtration units.

So then the idea is we will compare the chemical levels in the urine samples collected both before and after school, and between the classrooms with and without the air filtration units. We'll also compare the air quality results inside the classrooms to the levels outside the classrooms, but on school grounds. And having all this data and looking at it in conjunction with the biomonitoring data will really help us interpret our results.

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MS. HURLEY: So as I said, all the recruitment and field collection is done. We've sent the samples, the air samples and the urine samples, off for analyses.

We're starting to get some results trickling, but we anticipate having all the data in hand by the end of April. So then we'll spend the spring and the summer conducting some of our initial biomonitoring data analysis and preparing the packets of individual results returns. And then in the fall we'll plan to give presentations to share the general findings of our study.

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MS. HURLEY: So then the next biomonitoring study that we are planning and hoping to initiate in May is called the -- is called BiomSPHERE, which is the Biomonitoring component of the San Joaquin Valley Pollution and Health Environmental Research Study. This is -- the BiomSPHERE is a -- it's a collaborative effort, as you can see, involving many different institutions and government entities, including partnerships with the Central California Asthma Collaborative, as well as Little Manila Rising, which are two community-based organizations that are very actively working on air pollution issues in the San Joaquin Valley.

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MS. HURLEY: So the plan is what BiomSPHERE is is really to add a biomonitoring component to an existing research project, which is SPHERE. So before I get into the specifics of BiomSPHERE, I just wanted to step back

and tell you a little bit about SPHERE. So this is a project funded by the California Air Resources Board. The PIs are Asa Bradman from UC Merced and Betsy Noth from UC Berkeley. And the overall objective of this study is to assess exposures to air pollutants and noise among families living in Fresno and Stockton, which are two communities heavily burdened by air pollution in the San Joaquin Valley.

It will involve 90 child-parent pairs and include household air monitoring and sampling for selected criteria air pollutants, as well as black carbon and VOCs. There will also -- for the adult participants, they will be collecting personal air sampling for the selected criteria air pollutants by wearing, I think they're going to be little backpacks that they wear throughout the day. And they'll also be collecting measurements of noise levels and using surveys to collect additional information on exposures.

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MS. HURLEY: So BiomSPHERE will then build on the -- all the resources that SPHERE is collecting by collecting up to 270 urine samples from the SPHERE participants, including some repeat samples in a subset of households. And then the urine samples will be analyzed for the same suite of biomarkers that we are looking at in

SAPEP. And then BiomSPHERE will also add some air sampling for measurements of PAHs and related compounds, again to help interpret the biomonitoring results.

So the goals of BiomSPHERE are to directly evaluate air pollution exposures to families living in these two highly burdened communities, to examine differences in exposures between individuals, as well as within individuals over time, and across the two communities, to better map hyperlocal air pollution exposures in the two communities, to provide comparative data, which will help us with the interpretation of the results from SAPEP -- BiomSPHERE is going to have quite a bit of a larger sample size, so that will be useful -- and to build community capacity in the San Joaquin Valley, so they can continue to work as partners in biomonitoring studies in the future.

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MS. HURLEY: So then -- so that's where we're at now and what we've been doing. But now moving towards how we want to plan for future community biomonitoring studies that can support the goals of AB 617. You know, right now, the proposed State budget for the upcoming fiscal year includes $350,000 a year for ongoing funding to conduct targeted biomonitoring studies in support of AB 617.

So the goals of these studies are to complement and validate ongoing air monitoring in communities heavily burdened by air pollution, to increase our understanding of local exposures and potential health risks faced by folks living in these communities, and to evaluate specific emission and exposure reduction measures.

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MS. HURLEY: This ongoing funding will allow us to serve communities that are diverse with respect to geography, with respect to the types of chemical exposures, and the sources of those exposures, as well as the demographic characteristics and socioeconomic stressors.

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MS. HURLEY: So to explore the diversity and identify key priorities for our targeted biomonitoring studies, we've been engaging with communities and other stakeholders for a number of years. This has included discussions at public forums, such as SGP meetings, as well as AB 617 community steering -- community steering committee meetings. We've also drawn on findings from the Program's listening sessions with community organizations across the state, as well as other reports, such as AB 617 community emission reduction plans. So putting all that together, I'll now be just showing a series of slides on

what we've learned so far.

So communities have identified key priorities for biomonitoring studies, which include a number of recommendations, including actively -- to actively engage with communities to design and implement biomonitoring studies, to provide education and resources to build community capacity for partnering in biomonitoring studies, to measure more chemicals, as well as address multiple chemical exposures and potential synergistic effects, and then, you know, I think a very strongly recurring theme is to produce practical results, so results that are actionable that can be linked to potential health outcomes and can be used to develop and evaluate policies and strategies to reduce chemical exposures.

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MS. HURLEY: So then here is a list of selected air pollution sources of concern that have been identified by many of the impacted communities across the state.

These include freeway and road traffic, truck idling, port and warehouse activities, backyard burning, which actually also includes in a lot of areas concerns about burning in -- you know, open burning in homeless encampments, residential wood burning, exposures around agricultural activities, exposures around -- related to

refineries and fracking, and metal processing facilities.

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MS. HURLEY: So then the air pollutants of concern related to those sources of exposure include criteria air pollutants, such as PM2.5, PAHs, VOCs, pesticides, and metals.

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MS. HURLEY: So then -- so in thinking about choosing and designing future community biomonitoring studies that can support the goals of AB 617 and address these community priorities, there are a number of factors to consider. So these include the nature of the air pollutant exposures. So can the chemicals of concern be biomonitored? You know, do we have a biomarker? Are there specific strategies for exposure reduction that could be evaluated, like for example the school air filtration that we evaluated in SAPEP? Are there types of exposures relevant to other communities beyond the community in which the study is being conducted?

And then it's also important to think about the characteristics of the community, so where is it, what are its demographics, its -- the socioeconomic stressors posed on the community, as well as, you know, are there other chemical exposures and other environmental hazards that are important in the community.

And then obviously -- or, you know, it's also important to think about the availability of both research and community partners that can help -- that can be collaborative -- collaborators in -- in conducting these studies.

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MS. HURLEY: So then, you know, how do we go about identifying and developing projects for community biomonitoring? You know, what should that process look like?

So, you know, clearly, we will continue to attend AB 617 CSC meetings and other relevant community meetings and proactively reach out to community leaders and organizations to look for opportunities. And this is what we did in developing SAPEP.

We also plan to -- you know, continue to engage with researchers to identify ongoing projects that could benefit from adding a biomonitoring component and could then help advance the goals of AB 617. So that's pretty much the approach we used in developing BiomSPHERE. We also -- and Nerissa mentioned this in her talk earlier, you know, we also want to think about creating a public and transparent process for communities, and researchers, and other stakeholders to propose project ideas, so issuing something like a Request for Information where

folks can go online and give us their ideas for projects.

And then another type of project we might think about pursuing is, you know, one that would -- ones that would help us identify and develop the capacity to measure additional biomarkers that are related to air pollution exposures. And so ways we might do that is, you know, seek assistance from other state biomonitoring programs that maybe have capacity that we don't currently have, as well as contracting with researchers to develop new methods.

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MS. HURLEY: Oh, I'm sorry. I don't know what happened there. Let me just go back.

Sorry about that. Let me just get back to where I was.

Okay. So almost to the end here. So I just wanted to finish up with listing some topics for discussion that we'd like to get input on from the Panel and the audience in the next discussion section that's going to -- session that will follow. And some of these overlap with some of the things that Nerissa laid out earlier. We definitely would like to hear about existing research projects for which a biomonitoring component could be added that would help further the goals of AB 617.

In particular, you know, if this -- the -- funding the anticipated funding comes through for these ongoing biomonitoring projects, you know, we're going to need to act quickly. And so for the near term, we'd especially be interested in projects that are currently working with a community partner that are enrolling participants over the next year in regions that we haven't conducted studies yet and that are collecting complementary exposure and health information.

We also would like to hear options for how we might collect those ideas and what factors we might want to consider in evaluating the project ideas. And then finally, just hear any ideas you all may have about how we might identify and develop laboratory capacity, specifically to measure additional biomarkers related to air pollution.

So I guess before we get to that discussion though, I think I have a few minutes to answer any questions that people may have.

PANEL MEMBER LUDERER: Okay. Thank you very much. That was a very interesting presentation. And I know we're going to have a great discussion about that. But for the moment, now we will, as you said, look for some clarifying questions from the Panel, as well as from the audience. Cheryl, I think there was a question

received via Zoom webinar?

DR. HOLZMEYER: There was a question dropped into Q&A that has been answered in the Q&A by Nerissa. You might want to first see if there's questions from the Panel.

PANEL MEMBER LUDERER: Okay. Yes. Let me see if we have any raised hands here from the Panel. I see that Tom has his hand raised.

PANEL MEMBER McKONE: Yeah. This is kind of a quick but kind of deep dive technical question. I was really interested to see that you used IQAir filters for the Stockton schools, which is a great idea. I mean, they're great units. And having worked with different air cleaning units, they -- the question is how do you make sure they don't turn the fan speed down or maybe that's not something you know.

(Laughter.)

PANEL MEMBER McKONE: Because these units -- even though those are probably -- IQAir are probably the quietest ones -- or one of the quietest units out there, but I still think they run up to 60 decibels, which is, you know, louder than a refrigerator, can be annoying to people.

MS. HURLEY: Yeah.

PANEL MEMBER McKONE: And I'm sure the classroom

with all the other things going on is a great temptation to just turn that fan speed down to the lowest setting, assuming it won't make a difference. But, of course, the units, if they're sized for the room, are probably designed to be operating at one of the higher speeds. And I mean they might actually -- I think IQAir may have as much as like sometimes three or six speeds, so it's tempting to crank it down a little bit.

MS. HURLEY: Yeah, a great question. We did actually -- well, so one thing is we have no way of knowing if the teachers are fiddling with -- you know, fiddled with the settings during the study. So we don't know that. We did actually ask the principal, after the first day, if any of the teachers had complained about the noise. And she said one of them had, but she also said, you know, it was only -- it was -- you know, she encouraged them to just bear with it, because it was only -- really only four days, two days one week, two days the next week, where they had to keep running them, you know, for the purposes of the study. So she really gave the message to the teachers not to -- to mess with them. You know, whether or not -- you know, how that translated to reality, we don't know.

One of the things that one of the teachers did say to me though, when I was -- I asked her about the

noise, she said, oh, well, the kids are -- you know, classrooms are pretty noisy anyway, so -- you know, that -- so she wasn't bothered by it, but, yeah, we'll have to see how that -- yeah. I don't know what else to say about that.

PANEL MEMBER LUDERER: Thank you.

I'm looking to see if there are any other clarifying questions from any Panel members.

PANEL MEMBER SUÁREZ: I have a question.

PANEL MEMBER LUDERER: I have one. Okay. There you go. José, you have a question.

PANEL MEMBER SUÁREZ: Yes. Thank you for the presentation. The first one is just a comment. And I am -- I am so happy to hear that you -- a lot of or if not most of the work that you do is really centered around the community and all the efforts that you have been describing there to not just disseminate the findings, but open it up so the community can start engaging in developing their own -- potentially their own studies through these RF -- Requests for Information they have. So that's fantastic. I'm so happy to hear that.

I had just a general question. So since we were talking about the air filtration piece. So you mentioned that these -- these filters were on for just a total of four days, two days one week and two days another. Is

that how I understood it?

MS. HURLEY: Well, that's what we told them to do. They may have left them on in the interval between, because we did the study Monday and Tuesday of one week, Monday and Tuesday of the next week, whether or not they actually ran them, you know, the end of that -- the interval between week one and week two, we don't know. And actually since -- since the completion of the field work, we have been looking at some of the PurpleAir data inside and outside the classroom. And it looks like they're not running them anymore, even though we left them there, or just based on the fact that we're not seeing any gradient in the indoor/outdoor. We don't know, yeah.

PANEL MEMBER SUÁREZ: So with my -- my underlying question there is do you think you might be able to see with that short amount of time, I think it would be, what, like six hours each day that -- a challenge --

MS. HURLEY: A little bit more than that, yeah.

PANEL MEMBER SUÁREZ: -- six, six and a half, maybe seven. How -- do you think that's enough time for you to be seeing changes in the biomarkers?

MS. HURLEY: We do. The biomarkers are -- they have pretty short half-lives, so we feel confident.

PANEL MEMBER SUÁREZ: And then just my last question with that regard. Would you consider -- are

you -- so for this particular -- you have enrolled 18, is that -- that's your -- that's your total N, right --

MS. HURLEY: Yeah.

PANEL MEMBER SUÁREZ: -- that you're thinking about?

MS. HURLEY: Yeah.

PANEL MEMBER SUÁREZ: So this is -- you're thinking of this more as a pilot and are you thinking of taking this somewhere? What are you are plans here?

MS. HURLEY: Well, that's one of the things we're going -- we want to work through and talk about in the next session. I mean, yeah, it's -- it is, given our small sample size, it's going to be seen as -- or viewed as some preliminary data.

PANEL MEMBER SUÁREZ: Okay.

MS. HURLEY: And -- yeah, we'll have to kind of -- you know, the results from BiomSPHERE I think will build on this somewhat. Although, we won't have the -- the air filtration piece to really evaluate.

MS. HOOVER: Susan --

MS. HURLEY: Yes.

MS. HOOVER: -- can I just chime in here for a second? This is Sara.

So to clarify, José, you said you're thinking about 18? No, this is not the study design. This is the

study outcome. We were trying to get 60 participants. So we're still hopeful that we'll see something very useful, given how we designed the study, but it's not like we designed it to be small. Obviously, that was not the -- the case, as Susan explained. We were just excited that we had a study at all.

I'm going to pass it back to Ulrike. We only have a few more minutes for questions and we have a question in the chat -- our Q&A to address and someone wants to speak. So I don't know if there's other panel members, but just wanted to let you know that's happening.

PANEL MEMBER LUDERER: Okay. I don't, at the moment, see any raised hands from other Panel members, so we can go to the -- the question. Let's see, this was in the Q&A.

MS. HOOVER: Yes, but Stephanie is going to invite Dr. Sumchai who has her hand up to speak and provide her questions/comment verbally.

PANEL MEMBER LUDERER: Okay. Great.

MS. JARMUL: Yeah, so Dr. Sumchai, I'm going to unmute you now, so you can provide your comment.

MS. HOOVER: So if Dr. Sumchai is not ready to speak, Stephanie, why don't you go ahead and just read the two points that are in the Q&A right now, just read them aloud for people

MS. JARMUL: Okay. Dr. Sumchai stated, "I would add diesel particulates to the suite of TACs of major concern. Diesel contains about 20 carcinogens. CalEPA EnviroScreen measures diesel particulates as does the EPA EJScreen. The community we are working with in San Francisco with the AB 617 Marie Harrison Bayview Air Monitoring Network ranks in the 95th percentile for Diesel PM".

MS. HOOVER: And there is -- I'll just quickly chime in to say, yes, thank you very much. And certainly, when we talk about particulate matter, we're including diesel particulate matter in that umbrella.

And Stephanie, do you want to just go ahead and mention the other comment in the Q&A?

MS. JARMUL: Sure. We also received a comment Jeff - pardon my pronunciation - Esquivel regarding community concerns. "Metal shredding activities were noted. Perhaps other recycling shredding activities, paper and plastics, also may be beneficial".

PANEL MEMBER LUDERER: And I just thank you. I noticed that Dr. Sumchai has her hand raised still. Did she want to speak now?

MS. JARMUL: She's still unmuted. I don't --

PANEL MEMBER LUDERER: Okay.

MS. JARMUL: -- hear her. Dr. Sumchai, if -- you

can type again into the Q&A if you would like to chat still, speak.

MS. HOOVER: And we still have an hour. You know, we're moving on to the discussion session, so she can certainly speak and chime in during that hour. I think we should go ahead and move on to that, so you can put up the integrated discussion questions that we prepared for you.

PANEL MEMBER LUDERER: Okay. Are they going to be displayed?

MS. HOOVER: Yes.

PANEL MEMBER LUDERER: Okay. Great.

MS. HOOVER: Or we can do that for you, if you prefer, but it --

PANEL MEMBER LUDERER: Yes, that would be great, if you --

MS. HOOVER: Okay.

(Laughter.)

PANEL MEMBER LUDERER: How do -- because I'm not sure how I do it, so --

(Laughter.)

MS. HOOVER: Okay. Sorry. No problem. Let's see, Elizabeth, do you mind -- or did you want me to do that, Elizabeth? I can pull it up and share. I'll do that.

PANEL MEMBER LUDERER: Okay. In the meantime, I can just give -- introduce this. So we're going to have the next hour, as Sara just mentioned, to discuss the topics and questions that were presented in the first two talks. And the purpose of the discussion is to provide input to the Program to help inform planning for future studies, including community biomonitoring projects and to identify opportunities for other collaborations. And so we're going to start by going over the informal discussion questions.

MS. HOOVER: Okay. So it looks like -- I went to share and it said I can't share, because somebody else is sharing.

DR. MARDER: I popped them before your -- I popped them up first.

MS. HOOVER: Oh, okay. Fantastic. Thank you for being quicker. Go ahead.

PANEL MEMBER LUDERER: All right. Can we advance to the next slide?

PANEL MEMBER LUDERER: Thank you. So the first topic for discussion. I think -- I think we're going to go through all of them and then begin the discussion is my understanding.

So, first, we have the potential use of the Genetic Disease Screening Program, or GDSP samples for

statewide surveillance. And some of the questions to consider are what design considerations should we take into account when choosing GDSP samples for use in statewide surveillance, such as focusing on certain geographic regions, time periods, or demographics? Are there other factors that we would recommend?

And also since it is -- it will not be possible to directly interact with individual participants, do you have suggestions for how best to share these results with affected communities?

So then I think we're going through all of them. So can we move on to the next one, please?

--o0o--

PANEL MEMBER LUDERER: Okay. Next is potential additional program studies overseen by the California Department of Public Health, CDH. So if the program has the capacity to take on additional small projects beyond the current plans, such as statewide surveillance, do you have suggestions on promising collaborations to pursue or ways to identify promising collaborations, and which program goals are most important to consider as the program evaluates potential projects?

-o0o--

PANEL MEMBER LUDERER: Next set of questions and things to discuss is future studies related to advancing

AB 617 goals overseen by OEHHA, the Office of Environmental Health Hazard Assessment. And the specific questions are: can you recommend existing research projects that align with AB 617 goals and to which a biomonitoring component could be added? For near-term planning, the Program is especially interested in projects that are working with a community partner, enrolling participants over the next year, being conducted in geographic areas that have not yet been studied by the Program, collecting complementary exposure and health data. And the Program is planning to issue a Request for Information, or RFI, to help identify potential opportunities for future community biomonitoring studies. And what other types of approaches could we use to identify such opportunities for both the near and the long term? And which factors are most important to consider in evaluating these opportunities?

Okay. Let's see, I think -- next slide, please.

--o0o--

PANEL MEMBER LUDERER: So another topic for discussion is collaborations to analyze existing Program biomonitoring data. So there was a presentation -- the presentation earlier discussed the type of information that could be included in the data package and what other types, if any, should be included or could be included to

be shared with external researchers. Do you have ideas on specific partners to reach out to for these types of collaborations and what approaches would you recommend for publicizing this opportunity?

Okay. I think next slide, please.

--o0o--

PANEL MEMBER LUDERER: So finally, options for additional biomarkers related to air pollution exposures. Do you have specific suggestions on additional biomarkers for air pollutant exposures that would be worth pursuing? Do you have specific suggestions on academic laboratories in California that could be potential collaborators to develop methods to measure additional biomarkers?

Okay. Thank you for doing that. And I guess we can -- we don't have to do them in that order. We -- just please, if you -- I'm going to ask attendees who wish to speak to alert us by using the raise hand feature in the Zoom webinar, so that I can call on you. And so let me go ahead and start. It looks like we already have a raised hand. Tom.

MS. HOOVER: Yeah. Let me just say, Ulrike. I'm going to tell Elizabeth. Why don't you take that -- those discussion questions down. If people want to refer to them, they're posted on our website, on the meeting page, so you can flip through those. And I agree with you,

there's too many questions actually to cover in an hour for sure, so we put the first one -- the ones first that we really want to focus on --

PANEL MEMBER LUDERER: Okay.

MS. HOOVER: -- and then we can deal with other things later. So we can kind of check in over the hour and see where we're at. But please also -- people feel free to email us with your input on any of these things at any time. Okay. Back to you, Ulrike.

PANEL MEMBER LUDERER: All right. So, Tom, you have a question or a comment.

PANEL MEMBER McKONE: Yes. Thank you. So I think this question -- it occurred to me earlier on in the presentations and kind of reoccurred in a couple of places. And what it is is I particularly resonated with the discussion about the Biobank, and the non-Biobank, and the ability to do time trends. And I think time trends are very important for understanding. If you think back over many years of where we're looking at things that we find, you know, in biomarkers, the question is, is this something new? Is this something that's been there, we just never looked before? Is this something that's going up or going down?

I mean, the time trend is one of those fundamental questions. So having the capacity to -- to

track time trends I think is -- is very -- is very key. And so one of the thoughts I had -- you know, especially, I was looking at the Biobank. It's not complete, but you can do time trends with the material they had. But even if there's -- you know, what I think the Program needs to do is look at opportunities for continuity. So anything that exists that has a time trend as you're looking for new things, at least trying to match up enough, so that we don't lose the ability to cross over when we go to a new study, where things are a bit different and everything is collected. It would still be nice to figure out some mechanism to normalize our measurements or to make sure there's some continuity for things that we already have a rich time scale on or a time trend.

And again, I think that kind of relates to several questions here. But I do -- I did want to bring that up, because I think that's been one of the really powerful features we've had in biomonitoring is to watch what's happening in populations.

PANEL MEMBER LUDERER: Thank you, Tom.

I'm looking to see if there are any other raised hands at the moment.

Let's see. I'm not seeing any, but everyone has -- oh, Nerissa and José.

DR. WU: Well, thanks for your comment, Tom.

I agree the Biobank gives us this unique opportunity to look at a steady source of samples over an extended period of time. I guess the question is whether -- I mean, we have to choose one focus of sampling, so that we have sufficient power to really look at something like time trends. And so the question is are time trends more important than, for example, pulling samples from different geographic regions or, you know, what is -- is it more important to look, you know -- in comparing non-Biobank to biobanked things, is it more important to be able to go back to the past, back to the 90s or to the 2000s, or would we want to be able to look at some geographic diversity, for example, comparing, you know, inland to the coast or something like that?

So it's -- I mean, I agree that this is a really important -- I mean, they're all important, so we're looking for some clarity on what is the most important for to us sample towards.

PANEL MEMBER McKONE: Well, now -- and so I think the -- if I could respond, right? I don't have to wait to raise my hand again?

PANEL MEMBER LUDERER: Yeah.

PANEL MEMBER McKONE: Okay. No, that's a -- that's a great question. And the real challenge is like if you can't do both temporal detail and geographical

detail, I don't -- you know, I kind of defer to others. I think it -- if I had to put a little more weight on one or the other, I might put more weight on having time trends, just because there's so many things that -- where there are co-pollutants and other issues, that if we just had a lot of geography, and just a lot of snapshots -- you know, it's kind of like where do you want photographs and where do you want movies?

And might -- lots of photographs could be -- you know, tell you a lot, but you might want to -- if we lose the ability to see something that's happening in time. So I might weight them a little -- weight the -- you know, if the resources are limited, I wouldn't put it all into time, you know -- or in terms of preference, I wouldn't put it all on time trends, but maybe, you know, 40/60, 30/70. Like, if you have a priority, 30 percent -- or 40 percent priority to geographic and then 60 percent, if I had to -- you know, again, that's just -- I -- I would welcome anybody else's view on the alternate approach, which is maybe it's better to focus on geography, but that's kind of my own. And that's just -- I think from sitting on the Panel a long time, I think we've had impact where we've seen time trends, something rising or something falling.

MS. HOOVER: Okay. Thanks, Tom.

José, do you want to chime in?

PANEL MEMBER LUDERER: Yep, I was just going to call on him.

PANEL MEMBER SUÁREZ: Yeah. I'll -- since we're talking about that, I think -- I think it's an interesting piece that I -- that California Biomonitoring should start thinking about what to prioritize, because they're dif -- very different questions.

One question is asking how have these exposures changed over time? The other question is are there differences across populations right now? I think they're both answering very different questions. And I think they're both worthy of knowing, but I think this is more of the -- where is the Program headed towards?

And what I'm trying to get with that in addition is what types of partnerships you could start developing, right? So do you want to bring in, for example, cohort studies that have been sampling and collecting all these biospecimens for decades and measuring different compounds in that as one of those sources versus focusing more on newer studies that are recruiting participants versus doing something of your own.

And one of the examples, for instance, was Rancho Bernardo down here in San Diego County, there was this study published by Paul Mills a few years back just

looking at the temporal changes of glyphosate, that it had to have been measured over time. And this was -- this became, I think, a substantial contribution, because nobody had looked at glyphosate before you conducted the changes.

But I think this becomes maybe more of a deeper question with regards to what types of biomonitoring should be prioritized into what amount. And that would -- I think that would also shape your RFIs too, since you're -- you want to start collaborating with community, then you probably have been considering having two -- two different general sections of RFIs, one which would be -- we want to have more information about these particular topics, which are of most interest to you right now, as California Biomonitoring.

And then the other one, which is open to community, right, because there's this big movement to have the community also be involved in to designing some of these studies. So it might be something that it has to -- you have to have a balance, but it might be good to have these two different RFIs, one that's more guided what you want, and the one is more a community -- see what the community wants.

PANEL MEMBER LUDERER: One thought as I -- as I was hearing José and Carl and Tom's comments too was the

time trend versus geographic diversity. I mean, obviously, I think that that can be informed. Also, is there -- if there's a reason to believe that there's a -- an emerging contaminant or there is a -- there's been some sort of an intervention. For example, you know, when the flame retardant content law -- I'm blanking on the legislation, when that was changed, you know, to be able to track to see whether flame retardant levels declined over time, so that would be a situation where you might want to do a study looking at the time trends versus, you know, as José said, it really depends on the questions that are being asked. But there -- you know, if there's a reason to believe that there might be time trends, that might be one -- a situation where that would be what you would want to focus on for a study.

PANEL MEMBER SUÁREZ: A natural experiment, and TB 117.

PANEL MEMBER LUDERER: Exactly. Let's see. Is there any -- I'm looking for other hands raised.

José, you still have your hand up. Did you have another comment, or -- no okay.

All right. So some of these -- so that was really kind of talking about statewide surveillance, just to kind of refresh everyone. So we're also -- the next topic is potential additional Program studies overseen by

CDPH and then future studies related to advancing AB 617 goals overseen by OEHHA. So we could think about those.

I -- you know, one of the -- one I could maybe add some things, because the -- I have been thinking about an AB 617 -- as far as AB 617 studies go, so there's been a collaboration here in Orange County with the City of Santa Ana, the Madison Park Neighborhood Association is collaborating with researchers at UCI, including Jun Wu, and professors in the Department of Chemistry, Barbara Finlayson-Pitts. I also have been involved in the project. We're current -- the Madison Park Commun -- Neighborhood Association is concerned about air pollutants. It's a neighborhood that's predominantly Hispanic. They have not applied for AB 617 status, but the -- they do have multiple areas that come up as very high on the CalEnviroScreen tool.

So they have an ongoing collaboration, concerns about air pollution, as well as industries, because it's a heavily -- it's a neighborhood that's near a heavily industrialized area. So I just wanted to mention that as a possible collaboration with an ongoing study that's looking at air pollution, including PM, as well as contaminants from some of these industrial sources, a lot of metal processing facilities among other things.

So if other people have -- Tom, I see you have

another --

MS. HOOVER: Actually, Ulrike --

PANEL MEMBER LUDERER: Um-hmm.

MS. HOOVER: -- we have two comments in the chat.

PANEL MEMBER LUDERER: Okay.

MS. HOOVER: Apparently, Dr. Sumchai was having technical difficulties.

PANEL MEMBER LUDERER: Okay. So --

MS. HOOVER: So Cheryl is going to invite her and then we have another comment from Sharyle.

PANEL MEMBER LUDERER: Okay. Yep, I see.

MS. HOOVER: So let's start there and then we'll go back to Panel members.

PANEL MEMBER LUDERER: Yep. All right. Shall we start with Dr. Sumchai.

DR. HOLZMEYER: Yeah, so there's a comment from Dr. Sumchai. "I would like to contribute to the discussion topic on complementary exposure and health information from our experience at HP, or Hunters Point, biomonitoring. We are also looking at patterns of essential nutrient deficiencies and have embarked on a geospatial mapping of deficiencies in iron, calcium, selenium, zinc, and magnesium to triangulate with toxic metal detections".

Thank you for that -- that comment.

And could I move on to Sharyle's.

PANEL MEMBER LUDERER: Sure.

MS. HOOVER: Yeah, why don't you go ahead and cover Sharyle's comment. Thank you, Sharyle.

Go ahead, Cheryl.

DR. HOLZMEYER: Okay. Sharyle Patton commented, "NDAA authorized funds for states regarding PFAS clean-up and included funds for biomonitoring military personnel living on-site. It might be interesting, if possible, to include this population. It could be interesting comparison regarding time change and military population compared to non-military populations".

And then there's a second comment from her. "Firefighters are concerned with exposures to chemicals that adhere to particulate matter in smoke. Firefighters suggest that their exposures are no longer unique, given smoke plumes that may expose populations downwind from wildland urban interface exposures. The incidents and WUI fires is expected to increase, given increased heat and drought conditions throughout California".

Thank you for both.

PANEL MEMBER LUDERER: Yeah. Thank you very much for -- for both of those -- those comments, and thank you for reading them to us.

I see that, Jenny, you have your hand raised.

PANEL MEMBER QUINTANA: I think Tom was before me.

PANEL MEMBER LUDERER: Okay. Tom.

PANEL MEMBER McKONE: Yeah. Well, thanks. I do want to follow up. So there were two points that really fall into a theme that we should think about. And I think Dr. Luderer made the first one about, you know, CalEnviroScreen and kind of jumped over. And then, you know, I'm reading Dr. Sumchai's comment about looking at nutritional deficiencies, looking broader at factors in a community. And when I think -- what occurred to me actually before some of this, but got it reinforced, is that, you know, CalEnviroScreen and other things are tools for helping us drill down to find hotspots of stress.

And, you know, we tend to be focused maybe on just one thing, like chemicals or PM. But actually, I think, you know, we might want to consider that patterns of disease arrive from multiple interacting stressors, like lack of access to food, lack of access to health care, the stress that comes with poverty. And then you -- I think some of the things we're missing is how to measure these -- I mean, we can -- we can calculate it with CalEnviroScreen, but we might want to think about looking at other kinds of effect markers or even things that tell us more about the stress of the population, so we could

target some of our other biomonitoring to really focus on populations that are already heavily burdened with other factors.

And again, this is a bit ambitious, but I think it's a direction that a lot of research is starting to go to look at multiple stress factors overlapping and how they relate to disease burden at maybe the census tract or community scale.

PANEL MEMBER LUDERER: Thank you, Tom.

Jenny.

PANEL MEMBER QUINTANA: Hi. I start by talking about the AB 617 related questions. I'm very fortunate to be able to work with border communities, including the community of San Ysidro near where the Highway 5 goes into Tijuana, which is one of the busiest border crossings in the world and the community is very impacted by traffic.

And so thinking about how AB 617 can be really supported by California Biomonitoring, I think one of the key questions is what does biomonitoring add? Because if you have a question of how far does this pollution extend from the source, I think that air monitoring is very good at answering that question.

So I think what biomonitoring adds, as we all know, is exposure by all routes. It also incorporates activity level, so -- and body size. So you can imagine a

child is on a playground near the 5 and 805 where they come together in San Ysidro running around it's going to have very different body burden than the teacher maybe standing in the shade and watching the kids run around. And so I think that really helps communities understand where exposures are highest, including personal factors.

And so I really think we should always look at it through the lens of what biomonitoring adds to the question. And I think it can really show big disparities. A school that has an air conditioned gym versus a school that doesn't. So the other lens I'd like to shine on that with biomonitoring is the effect of disparities. And these could be structural like having an air conditioned gym to play versus playing outside near a freeway or it could be other disparities we've already talked about.

So that's kind of a broad comment. So I guess -- but that's my thought thinking of AB 617. And again, I think just given vehicle exposures as being a major source of pollution in California that continuing diesel biomarker work and also looking at markers of gasoline vehicle exposures, and looking at the disparities of body -- and exposures to vulnerable populations will be a focus.

And I could stop there, if you want. I have other comments, but I might as well stop and let someone

else talk, and then I can come back with a different question, if you want.

Thank you.

PANEL MEMBER LUDERER: Well, at -- at the moment, I'm not seeing any additional hands raised, so if you wanted to add some additional comments, please do.

PANEL MEMBER QUINTANA: This is to do with the mission of statewide surveillance and looking at exposures over time that -- we had that discussion that started this conversation. I think that in terms of the Biobank samples, it was my understanding that we could go forward on geographical diversity by requesting the samples, but they were only archived for a certain geographical area. Right. So if we look at time, it has to be based on that geographical area was how I interpreted the slides, so -- but I think perhaps to do both these things, we should request them in a larger area going forward, you know, so we can actually look at that time -- rather than looking back in time, look to try to collect, and request, and move forward with samples.

So one question has to me is over what time frame are you asking for advice? Is it what you should do the next year, or what should you plan for in the next five years, or 10 years? So it kind of changes my answer to that question.

DR. WU: Ulrike, could I respond to that?

PANEL MEMBER LUDERER: Yes, please do, Nerissa.

DR. WU: Okay. Well, I think we want to sample in a way -- like we don't want to go one way next year, then change direction the following year, because the whole part of the sam -- trying to think through the sampling plan is so that we have enough power to really answer a question, rather than having a few samples for one question, then a few samples for another question.

So we're really trying to get an idea of how this cumulative body of data will serve us. You are correct that for the biobanked counties, so for those seven counties, we can go back in time to -- I think it's like 1995, and then continue the time trend. So if you're trying to answer a question of how have PFASs changed over this longer period of time or, you know, are there other PFASs being introduced at certain time points, we would want to go back in time.

If the question is from now how -- are they continuing to decline or are there new PFASs being introduced starting from, you know, whenever we pick our first sample batch, then -- then we could go from any -- to any county and look at that decline. I think it really depends on -- on whether you're interested in looking at that past, and whether there are points -- relevant points

of new PFASs or other compounds being introduced that we would want to be able to look at.

PANEL MEMBER QUINTANA: I have a question I guess to you while you're answering these questions so nicely is my memory was that we were limited in the different analytes from some of these archived samples, because they were not collected in the right kind of tubes or stored in the right, you know, kind of buffer, or whatever. So I think it might be helpful to kind of remind us what we cannot measure in those samples, because that might be important too.

DR. WU: Right. So it's only a serum sample to start with. And the serum separator gel does have trace levels of metals, so we -- we did do some trials with metals and we just found that we couldn't -- we couldn't adequately correct for that -- for that contamination. So we can look at PFAS. We can look at POPs. But one of the limits for POPs is that the archive samples, we only have a 0.5 ml or -- more or less sample, so we don't have enough to send out for a lipid sample in addition for -- the POPs analyses. So we have done some POPs work by just picking the samples for which we have enough -- enough serum. So there are definitely limits to those Biobank samples and what we can do.

June-Soo might be able to talk a little bit more

about the volume of sample that's needed for PFAS as well as non-targeted screening, and if there are other novel analyses that he might want to run on serum samples.

PANEL MEMBER LUDERER: Thanks, Nerissa. Does June-Soo -- do you want to comment on that now and then I also see that we have a comment from Eunha.

MS. HOOVER: I would go ahead with Eunha.

PANEL MEMBER LUDERER: Okay. Eunha.

MS. HOOVER: We can get back on the volume issue.

PANEL MEMBER HOH: Yeah. I mean, it's a little bit extension to the previous conversation, but it's a little bit changing the subject, but I kind of wonder, you know, the -- it's always challenging to find or come up with new emerging chemicals in terms of the biomonitoring. So we are always limited by the volume of the samples, you know, if it's archived, if it's very small, what's the condition, and things like that. So I was wondering, I know that I'm serving the science committee for one of my colleagues in UCSD that Tina Chambers, I know she has run the breast milk basically biorepository for several years and she's continued doing it. So they have quite a bit of breast milk samples that could be so like in a small study, you know, to look for the -- what are the new emerging chemicals, you know, in terms of the exposure in Californians. I just wanted to bring it.

PANEL MEMBER LUDERER: Thank you.

Let's see, did we want to go back to the other question or do we have any -- let's see, I'm looking...

MS. HOOVER: Yeah, I think that would be great to review some of the other questions.

PANEL MEMBER LUDERER: Yeah.

MS. HOOVER: But I do have one question to follow up on with Jenny just to ask her. You mentioned biomarkers of gasoline-related pollution. I did a huge report on gasoline-related pollution. We had a workshop years ago to try to look for specific biomarkers. Are you thinking of anything in particular, I'm just curious, or were you just speaking more generally?

PANEL MEMBER QUINTANA: I was speaking more generally. I think in my mind I was thinking of VOCs like benzene, but I was not speaking from the level of expertise that you are -- could speak.

MS. HOOVER: Okay. I just want to make sure I -- there wasn't some new development that I -- that we should write down. But yeah, thank you for that.

PANEL MEMBER LUDERER: All right. Thank you. So let's see, some of the other -- the other questions in addition to those that we have been discussing are -- and I think some of this has been brought up a little bit already, collaborations to analyzing existing program

biomonitoring data, the types of information that should be included in the data package to be shared with external researchers and ideas on specific partners, and then options for additional biomarkers related to air pollution exposures. And do we have specific suggestions for additional biomarkers and also for academic laboratories in California that could be collaborators to develop additional methods?

MS. HOOVER: And I would also just highlight for those of you -- you know, your academic connections just the question that Susan had about whether you have ideas for specific projects. So we're, you know, faced -- because we have this ongoing funding that may arrive in July, we need to immediately jump on opportunities for building a biomonitoring study. So if anybody has suggestions of specific existing research projects that were alluded to, but any -- any details on that would be fantastic.

PANEL MEMBER LUDERER: Jenny.

PANEL MEMBER QUINTANA: So I -- I don't know -- I assume you have approached already all the AB 617 selected communities or is that something that I might suggest could be done? Like, for example, our recently selected border community, just selected a few months ago, and they actually are going to have an ongoing project where they

have indoor and outdoor measurements of air quality near the U.S.-Mexico border. So I'm just -- so -- but that's only one of many communities. And I wasn't sure if you've already formally reached out to communities or that's some that I might recommend.

MS. HOOVER: I will just chime in and then Susan perhaps can add to what I say. So we -- you may recall or you may not recall that we actually visited all the AB 617 communities at that time, and we definitely are in connection with communities and we are in connection with ARB and air districts. However, this kind of information that you have is really useful, because there's so many communities. So knowing about a specific project that we might tag onto is really helpful. So thank you for that and please keep those suggestions coming.

I don't know, Susan, did you want to say anything else about community connections?

MS. HURLEY: No, I don't think so. You know, we've -- we've been trying to keep on top of what's going on in the AB 617 communities, but, you know, through attendance at meetings -- lots of times we can't attend them, but, you know, we've got the recordings and we're hearing through our CARB colleagues also what's going on. But, you know, we also are interested in doing studies beyond the officially designated AB 617 communities,

because there really are a lot of heavily impacted communities that, you know, aren't officially designated through the program.

But, yeah -- so -- so I wouldn't say that we -- yeah, so I don't know if I have much more to say on that. I do think we also have been reaching out to researchers. You know, I've just been reaching out to former colleagues that I've worked with to find out, hey, are you doing, you know, any studies right now, or you're enrolling folks, then, you know, what other kind of data are you collecting.

And so, you know, if anyone has any, you know, ideas on people. I know Ulrike you mentioned the thing in Santa Ana. I'd like to follow up with you on that, you know, later.

PANEL MEMBER LUDERER: Okay.

MS. HURLEY: If anyone else has ideas like that, we'd certainly love to hear them.

PANEL MEMBER QUINTANA: So is there some place that we have a record -- or that I could know who you've talked to? And I'm thinking, for example, in Imperial Valley, which has a long-running project. I mean, have you -- they're very interested in pesticide exposures. Have you had specific discussions about that with them or -- I mean, I guess --

MS. HOOVER: Let me -- let me just --

PANEL MEMBER QUINTANA: -- I'm asking two things. How do you know --

MS. HOOVER: Yeah.

PANEL MEMBER QUINTANA: I'm asking how to know and how to facilitate.

MS. HURLEY: Yeah.

PANEL MEMBER QUINTANA: I'm asking those two separate things, I guess.

MS. HOOVER: We have had -- we've had contact with many communities over the years, direct contact, contact through the SGP, consultations through listening sessions. But I -- regardless, I would encourage you to share whatever idea that you have. I also want to just split it into near term and long term, because to build a -- you know, a truly community-based participatory research project, that's going to be an effort over time. So we're also interested in studies where we could add a biomonitoring component to a study that's already up and running.

So we have -- we're facing that. So it's two different things. So we welcome the long-term ideas. We're -- obviously that's in our mind too about building projects with communities across the state in areas that we haven't visited yet. That's all part of our reason for

asking for ongoing funding, but we're also very eager to hear, particularly in Southern California, if there are studies that would be -- that are kind of already in that stage of having a community partner, having a good design, where we could add on a biomonitoring component by, you know, amending the IRB, something like that would be fantastic to hear about.

PANEL MEMBER SUÁREZ: And I -- coming from SoCal, I do have a couple of ideas in that regard, so I'll probably follow up with -- with you about this. I think there's some very good opportunities, if you're looking more for Southern California.

MS. HOOVER: Great. And if they're short, you could name them here for everyone to hear, unless they're -- unless you don't want to do that. But if you have ideas that you can share publicly, that would be fantastic. Otherwise, yeah, you can email the biomonitoring email or us directly.

PANEL MEMBER SUÁREZ: Very good. Sorry, I didn't mean to interrupt. Lara was next.

PANEL MEMBER LUDERER: I was just going to say, Lara, you have your hand raised.

PANEL MEMBER CUSHING: Yeah. Thank you. I was going to mention that in LA, there's a lot of interest on the part of community groups in understanding exposures

related to oil and gas drilling, given all the oil and gas operations in LA. And there's a couple of ongoing projects that I think might kind of fit the bill of what you're looking for. So I might follow up with you about that, one that I'm involved with, and then others that I know about that I'm not involved with, but that are recruiting participants that live near urban drilling sites, and are concerned about, you know, VOCs and PAHs, and things like that.

MS. HURLEY: That would be great.

PANEL MEMBER LUDERER: Thank you.

Let's see. Any other suggestions while we're on that topic of specific studies that people know of that may be of interest?

Jenny, you have your hand up.

PANEL MEMBER QUINTANA: I did. I just want to -- following along on the methods development I think was a point in one of the questions. In terms of getting a really -- a comprehensive California-wide sample, it seems like the infant blood spots would be at least a very large source. And I'm just wondering if further methods to be able to utilize those samples might be an area to at least get at the statewide surveillance issue.

PANEL MEMBER LUDERER: Nerissa, did you have a comment on that?

DR. WU: Sure. Yeah, I mean, it certainly is very thorough coverage. It's over 90 percent, I think, of newborn babies and all of those are biobanked. It's not just from particular counties. I think there has been a review really recently from Dana Barr, in I think it's 2021, where they did look at the state of the science of newborn bloodspots, particularly for PFAS and POPs. And there are still a lot of kind of method issues to work out, but there was also I think some work done for metals, particularly lead and mercury coming from a different group. That was kind of looking at how predictive the XRF of a newborn spot was like a -- an ICAP method on whole blood. And it looked pretty good.

So I think -- (coughing) -- excuse me -- those would be areas, like just -- this is like the long term where method development and validation would be really something we might want to look into to get at this -- to get at this question of surveillance and also a broader set of analytes that we could look at.

PANEL MEMBER LUDERER: Can you remind us which analytes have already been looked at by the Program in those blood spots? I recall, was it -- were there some POPs, if I'm remembering it right?

DR. WU: For the newborn blood spots, I think --

PANEL MEMBER LUDERER: Yeah.

DR. WU: -- I think Jianwen has done some work with PBDEs. And I think cotinine, but I -- the Program -- which is not part of the Biomonitoring Program --

PANEL MEMBER LUDERER: Um-hmm.

DR. WU: -- but I don't know that there's any other work that's been done by the Program. And I should clarify the McGill work on metals was not newborn blood spots. It was blood spots deliberately created for -- for this metal assessment.

PANEL MEMBER LUDERER: Thank you. Okay.

Other comments?

José?

PANEL MEMBER SUÁREZ: Yeah. This is more of a brainstorm than a comment. You know, we're in the middle of a pandemic with COVID being screened for a good amount. Are there any groups that are collecting a lot of samples from all over the state? That could be another partnership. That could be a benefit. And I don't know. It was just a brainstorm.

DR. WU: There is sero prevalence work being done at the State. I think we maybe talked about this last time. I think it would be complicated to try to get our consent work -- you know, get the appropriate consent on those samples. And obviously, the COVID work is running fast and it's like -- it's a complicated group to get

involved with, because they're already dealing with so much. But certainly, as we -- I see these kind of public health efforts, and COVID turning into something that we monitor over the long term, getting involved with other surveillance type projects, it is something I think we should keep an eye on.

PANEL MEMBER LUDERER: I have a question related to the air pollutant biomarkers. Can you remind us whether the nitropyrene measurements whether that's something that the Program currently has capacity to do, because I recall that there was a partnership with the University of Washington on that.

MS. HOOVER: That's right. And no the Program lab has not developed that capacity.

PANEL MEMBER LUDERER: Um-hmm.

MS. HOOVER: I will just say that it's a very tricky method for certain reasons. And, you know, the outside-of-State contracting is also potentially tricky. It's definitely obviously an important thing to pursue and it's on our list as a priority to figure out how to address. So I'll reassure both you Jenny about that. We're very aware of how important that is. And that's something we can report back on in the future. And we'll also be keeping an eye on the science in terms of the ability to measure that biomarker.

PANEL MEMBER LUDERER: Okay. Thank you for that update. Other questions, comments?

José.

PANEL MEMBER SUÁREZ: Yeah. I don't know if we can talk about this, just kind of jumping back to one of the presentations, talking about the Stockton air pollution. Well, unless -- I know this is not one of the questions you had, so I can defer this later on unless somebody has some question or answer specifically to the topics they want to discuss.

MS. HOOVER: Go ahead, José.

PANEL MEMBER LUDERER: Go ahead.

MS. HOOVER: Yeah.

PANEL MEMBER SUÁREZ: Okay. I think trying to find solutions to problems and doing research and that's great. And so I guess coming back to the discussion that we had earlier in this regard, what are your thoughts right now, now that you've done the intervention here with these 18 parent-child pairs. And one more question underlying that too. We're also -- I see the parents were involved. Did they also provide samples or is it just the students?

MS. HURLEY: Yeah. The parents did not provide samples. Although on the BiomSPHERE study, we will have matched parent-child pairs of urine. So we will be able

to see, you know, differences between adults and kids.

In terms of, you know, where we go next on, you know, air filtration, I mean, we haven't seen our results yet. I kind of want to see how things, you know, shake out. There are still many communities that are using air filtration in schools and other ways to reduce exposures. That's definitely a research question of real interest. And it's -- so we're keeping it on our radar screen, but don't -- you know, we don't -- you know, we don't have any specific plans for following up on it right at this moment.

PANEL MEMBER SUÁREZ: Yeah. I mean, just because there may be some statistics -- statistical limitations that you may hit -- you may hit --

MS. HURLEY: Oh, yeah.

PANEL MEMBER SUAREZ: -- you may hit, given the small sample size --

MS. HURLEY: Yeah.

PANEL MEMBER SUÁREZ: -- and whether you see something or whether you don't see something -- yeah, I mean, it's something to start thinking about in a way in advance, right? What if you don't see any signal, but you see a little bit -- maybe a trend, is that enough for you to say maybe we should do a slightly bigger study to make sure that this is right, which a lot of times with very

small studies it tends to be the case, right? You don't see anything significant just because you don't have the power to detect that difference necessarily, but maybe you can see a little trend going in a certain direction.

MS. HURLEY: Right.

PANEL MEMBER SUÁREZ: So something to think about in that piece. And, of course, the other piece is the methodology. And I think that's one of the questions that Tom had about compliance, right? How sure are we that there was compliance during those four days? And the other side of the equation is you're not sure if they had it on the whole week and what does that do to the whole piece, right?

I mean, it would only strengthen any differences if that's something that does work. However, there's some questions with the methodology, right, that, you know, are a little bit challenging and need to be disentangled.

And then -- and then the underlying thing, of course, is the lack of a control group, now pre-/post- in this case, given that it's a short amount of time maybe is alright. But in the ideal world, we would have a control group that did not have anything that we can compare with for that, right?

MS. HOOVER: I'll just say two things. Yes, acknowledged about the small study size. And we certainly

plan and hope to do a larger study. I'll also say that there's a lot of other work going on to test the efficacy of air filtration in schools. And CARB is working on developing a study like that in schools. Hopefully, that will come to fruition. So we're quite aware of that -- we're limited by our study design and that could be an issue, so just acknowledging that.

I'll also say, just to make sure everyone is clear, this wasn't a classic quote intervention study exactly. You know, we had certain classrooms with the filtration and certain classrooms without. So it's the before and after school that we're looking at. So it's embedded like in each student really, that like before they come to school, after they leave school do we see differences, and then between classrooms with and without.

So as Susan shows our -- showed our schematic, we have all this complicated, you know, comparison to do. And you're right, we won't have power, you know, to look at it all. But I think we might see some interesting patterns and we'll definitely be reporting back on that at a future meeting.

PANEL MEMBER LUDERER: I actually had kind of a related comment. And Susan, I think you mentioned that you left the air filtration -- filters there, but that as far as -- but you don't know or you think that they're not

using them. I mean, I would think that would be really potentially very useful information certainly for designing a future study to know, you know, if they're not continuing to use them, why not? You know, is there anything that could be done to improve usage of them, especially if you find that they're beneficial.

MS. HURLEY: Yes, definitely. And it's actually -- we just recently -- you know, we're looking at just the PurpleAir monitoring that's been done, you know, since the study was over. And we have a student looking at that. And she made note of that. And we actually -- I have an appointment to speak to the principal next week about a number of things -- following up on a number of things on the projects and that's one of the issues I wanted to bring up.

MS. HOOVER: I'll also just --

PANEL MEMBER LUDERER: That's great.

MS. HOOVER: Yeah. I'll also just chime in to say that I don't know Susan if you touched on this, but the reason that we used IQAir is because we were dealing with a school that didn't have embedded air filtration in their system. So we wanted to look at the effectiveness of air filtration that's similar.

However, we now are -- as part of our project, we wanted to also help the school by purchasing MERV 13

filters. So that would go straight in their HVAC system. So that's in process too. Now, we won't -- we won't be doing biomonitoring before and after, but we could look at like what's Susan is saying, the PurpleAir results before and after installing the MERV 13. So that's another little extra add-on for the study that we're currently planning.

PANEL MEMBER LUDERER: Yeah. That's great. Thank you. And Jenny, you've had your hand raised for a while.

PANEL MEMBER QUINTANA: Hi. Thank you. Since José opened the door to stuff that would be great to do, I think that it is really important to communities to find solutions. And so expanding filtration or other solutions, I think we should think about partnering with State geographers and looking at tree cover and other issues, greenness issues, with biomonitoring might be a very powerful way to -- to look at that as a solution, whether it's just general greenness, or tree cover, or, you know, even barriers where they have freeways with trees along them, and then freeways where they don't.

I just think that would be a solution of interest to the communities as well. And even though it's -- it's not helpful in terms of climate change to really promote air conditioning, it really is better to exercise in a

clean environment like an air conditioned gym or building near a freeway than it would be to run around and breathe direct exhaust.

And so I think also perhaps documenting benefits of those kind of clean air exercise environments, because -- for children especially, because they have, you know, such huge uptake relative to their body size. It might be an area where we could demonstrate a solution to communities. I think that's very powerful, as well as, of course, we already mentioned before looking at changes in policy, looking at what has California done with clean diesel, and even after that has arrived, what disparities could still exist, you know, near the border in San Diego, for example, where we have a lot of older vehicles or vehicles from Mexico, or whatever. Where would the disparities still linger also in Imperial County as well?

We thought that with flame retardants that the benefits reached more affluent people quicker than they did people of less means. So anyway, so just kind of looking at those issues. Thank you. Again, kind of a future direction.

Thank you.

PANEL MEMBER LUDERER: Thank you.

MS. HOOVER: Susan, did you want to comment on that you are, in fact, attending a meeting on barriers?

So that -- that's on the radar screen for communities and we're staying in touch about that sort of mitigation strategy. I don't know if there's more to say than that, but --

MS. HURLEY: Yeah, probably not yet, but it's certainly a strategy that is -- there's a lot of growing interest around that. And, you know, whether or not biomonitoring can add something to that or not, you know, we're going to look into it, and, yeah, see.

MS. HOOVER: I'm wondering -- I don't know of there are more hands raised, but maybe this would be a good time, Cheryl, to chime in with Dr. Sumchai's latest comment. And I would say just paraphrase pieces of it, since it's rather long. It's in the Q&A.

DR. HOLZMEYER: Right.

MS. HOOVER: We'll capture it in full.

DR. HOLZMEYER: Okay. And I just saw José raise his hand. I know there's other.

PANEL MEMBER LUDERER: Yes.

DR. HOLZMEYER: There's a comment from Dr. Sumchai. "Thank you. Hunters Point biomonitoring will be meeting with Dr. Terry Hamilton who leads the Marshall Islands Plutonium Biomonitoring Program for Lawrence-Livermore Laboratories next month. We have historical and environmental survey work that supports our

belief we have a plutonium exposed population at the Hunters Point Naval Shipyard federal superfund system, where up to 90 Operation Crossroads ships were docked. The Navy has detected Plutonium 238 and 239 in concentrations 44 times higher than background. I raise this point for two reasons. Given world events, we should be looking at biomarkers of radiation exposure. And I also want you to look at the very sensitive and specific mass spec capabilities at Lawrence-Livermore and Los Alamos UC facilities".

And I read the whole thing, because I didn't know how best to paraphrase that, but thank you for your comment.

PANEL MEMBER LUDERER: Yeah. Thank you very much, and thank you for reading that.

José.

PANEL MEMBER SUÁREZ: Yeah, I mean, that's a very interesting population similar to the firefighters too with unique exposures.

I had -- I had some comments made about the website, if you want to talk a little bit about that, if that's -- if that's of any use.

MS. HOOVER: Sure. And actually, I did want to -- I thank you for your praise earlier, but the website has not changed. Everything you saw has been in the

existing website for a long time, so I'm glad you found your way around it. That's --

PANEL MEMBER SUÁREZ: No, no, no. There were -- there were some changes though within the studies that I found it a little bit easier to navigate. And this is --

MS. HOOVER: There's been no structural changes in the website. It might just be how we posted things particularly. Anyway, it doesn't matter. We don't need to quibble. Thank you for the praise. Glad you're following it. However, I will just clarify something Nerissa said, which is we're working on the website. We actually have to undergo Drupal 9 conversion, so we have to update our Drupal, that we're using, which is the platform that we use for the website.

Our IT has -- is now working with contractors. So this actually is an opportunity for more extensive changes, including to the results database. So I would like to just -- we didn't put that as one of our discussion questions, but certainly, José, if you have thoughts, we'd love to hear them. And if others have ideas, you can email us at the Biomonitoring California email.

PANEL MEMBER SUÁREZ: Yeah, maybe -- could I share my screen then?

MS. HOOVER: I think so. Elizabeth, can you --

PANEL MEMBER SUÁREZ: All right. I'll give it a shot there.

MS. HOOVER: -- him --

DR. MARDER: Jose, has the authority to share. There you go.

PANEL MEMBER SUÁREZ: So hopefully I'm sharing the --

DR. MARDER: You are.

PANEL MEMBER SUÁREZ: -- Biomonitoring website.

Great.

So -- so this part right here, I really like this page that I'm going to open as a separate tab here. And then, of course, you can click on all of these different studies that are very well laid out. And then now we can see all the different chemicals we filled in each one of the studies. That page is so good that I feel like this little link here is a little too small to make justice.

MS. HOOVER: Yeah, I'll just say that's already being addressed. So don't it -- don't pay attention to landing pages. That particular page has bothered both Dan Sultana and I for a long time.

PANEL MEMBER SUÁREZ: All right.

MS. HOOVER: That will be addressed. In fact, all of the buttons at the top, if you hover over those buttons, José, the buttons, if you hover, you get that

menu. If you click you get a landing page. The landing page function will be gone. So we're going to be looking at which landing pages we want to capture. They'll be part of the menu. And we will definitely be revamping. So agreed on that. I don't actually know how that strange link got in there, but we agree it's non-functional.

PANEL MEMBER SUÁREZ: Oh, okay. Okay. And the other piece that I was mentioning that would be nice would be to have a tab for researchers. So that's -- that's what I was trying to get at with the visual piece. So we have the projects, results, resources in one tab specifically for researchers, so that they can click on that. I don't know if they -- the closest thing would be resources, but maybe not.

MS. HOOVER: I think we have -- if you hover over results, we have a tab -- we have a page for researchers -- information for researchers,

PANEL MEMBER SUÁREZ: Okay. Got it.

MS. HOOVER: Yeah.

PANEL MEMBER SUÁREZ: With results.

MS. HOOVER: Now, that's an old page, so this is something that Nerissa was alluding to in terms of updating it and adding information like the data package. I will tell you, José, that I appreciate your suggestion for a specific tab, but those are limited. So we have to

choose -- we have to be judicious about what we make a main tab. We can't add more main tabs, so if we add a tab, we have to take away a tab.

PANEL MEMBER SUÁREZ: Yeah. I mean, yeah, it depends on how much of a priority do you want the collaboration. So the more attention you bring onto it, a bit easier you make it for the researchers to access, the more they're going to do that. So I think that's one of those things, you know, worth pondering how much attention or make it so that maybe you can call it re -- you know, well results is good, but in a way so researchers can very quickly get to that point and then the next stages. Of course, what data you want is freely available that people can download or investigators can download, or which not, which like -- the counterpart would be like NHANES, right? They try to put us everything pretty much out there and you can download it from the different signs of things.

So, I mean, that's something, I think, for you to decide what kind of information you want to be able -- easily available, and having the least amount of barriers for people to download.

MS. HOOVER: Sure. And we'll take that into account and Nerissa will definitely be thinking about that. That's something, like I said, we're thinking about the redesign of the results database, so if you have

suggestions. I'm just noting we have only three minutes left. So Ulrike, I think this is probably a good time to wrap up.

PANEL MEMBER LUDERER: Yes. So do -- does anyone have anything else that they wanted to comment on related to these discussion questions, now is the time?

All right. Not seeing any additional hands or questions in the chat.

José, your hand is up. Is it -- do you have a new comment.

PANEL MEMBER SUÁREZ: (Shakes head).

PANEL MEMBER LUDERER: No. Okay. All right. Then I think we can move on to the next topic.

So I don't think Sara needs any introduction, but I'd like to introduce Sara. She is the Chief of the Safer Alternatives Assessment and Biomonitoring Section of OEHHA. And she's going to report back on the Buck et al. 2011 definition of PFASs following up on a discussion that we had at our previous Scientific Guidance Panel meeting. So, Sara.

MS. HOOVER: Thank you.

(Thereupon a slide presentation.)

MS. HOOVER: Okay. So I'll first ask if people can now see that?

PANEL MEMBER LUDERER: Yes.

MS. HOOVER: Fantastic. Okay. And actually, sorry, this was -- we were testing this earlier, so it's further down in the -- the talk. Okay. So as Ulrike just said, I'm reporting back on the Buck et al. definition. And the first thing I'd like to do is I'd like to acknowledge Kathy Durkin, who is Director of the Molecular Graphics and Computation Facility at UC Berkeley. She did some really helpful background research for us on this topic. And we had a number of discussions to help us sort some of these more complicated issues out. And I'd also like to thank Simona Balan and Tom Bruton of DTSC's Safer Consumer Products Program for their input as well.

And the first thing I want to do is remind everyone that this is an informational item only. It's not a voting item, so we're not going to be making any decisions on changes to the definition today.

We've only just begun delving in to the extensive literature on defining PFASs and other fluorinated compounds. So really today we just want to illustrate what we found so far in terms of Buck et al., suggest possible next steps, and receive input from the Panel and public on directions we might take.

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MS. HOOVER: So in terms of some background, just to bring everybody up to speed of where we are, we do rely

on the Buck et al. 2011 definition for PFASs. PFASs as an entire class were recommended by the SGP for addition to the list of designated chemicals in March 2015 and the list of priority chemicals in November 2015.

And then as was mentioned at the last meeting, we had -- we had a focus on PFASs and we were asked to take a look at the Buck et al. definition in terms of PFASs that may be missed. So I'm now going to walk you through some excerpts of Buck just to illustrate some of the things -- interesting things we identified.

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MS. HOOVER: So this first excerpt is sort of their first overarching definition which many people, including us, have cited. I've highlighted some key elements. So PFASs are defined as aliphatic. That's a significant restriction. It -- in which one or more carbon atoms have all of the hydrogens substituted with fluorine atoms in such a manner that they contain the perfluoroalkyl moiety shown, which is the -- a part of the chemical that has this formula, CnF2n+1.

So, next slide.

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MS. HOOVER: But Buck et al. go on to say, "More explicitly, we recommend that the family of compounds denoted by PFAS should encompass: perfluoroalkyl

substances..." -- in this case, you have all of the hydrogen atoms attached to carbon atoms replaced with fluorine, except if it were to affect the functional groups. So hydrogens on functional groups obviously are not replaced.

Interestingly, you will see that this bullet on perfluoroalkyl substances does not mention the moiety, so that's an interesting point to note. Polyfluoroalkyl substances are similar substances, but in this case, it's just at least one, but not all carbon atoms have been replaced -- have the hydrogen atoms replaced by fluorines. And here they do emphasize the moiety for polyfluoroalkyl. And the reason it emphasizes moiety, if you read down this complicated text, is because they want grouped fluorines in polyfluoroalkyl substances and not fluorines scattered across the molecule. So that seems to be a key function of that moiety in Buck et al.

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MS. HOOVER: Next, I'm just showing you this figure. Buck et al., which is actually a very helpful figure, we've retyped it for clarity. And I'm going to just point a couple things in here. It's called the classification hierarchy of environmentally relevant PFASs. And there's some things to note here.

First of all, again, they don't talk about the

moiety. They just pull the main definition of the per and poly substances. I want to draw your attention to this line. Aliphatic PFCs, that's a very broad term that has a particular meaning. I'll be showing you on the next slide an example. It may or may not have the moiety in aliphatic perfluorocarbon. And then fluoropolymers is also of interest, carbon-only polymer backbone with fluorines directly attached.

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MS. HOOVER: So here are just some example chemicals to try to give you a picture of what we're talking about here. Here, we have PFOS, which is clearly a PFAS. It has the perfluoroalkyl moiety. You see the C8F17, which meets the criterion and it's attached to a functional group.

Here, we have an example of an aliphatic PFC. So according to the table I just showed you, it should be considered a PFAS. It doesn't have the moiety. So most people would interpret Buck et al. as excluding this, not everybody. So there's -- you know, you could read Buck in different ways. If you don't apply the moiety as a completely restrictive criterion, this would be included as a PFAS.

So coming to the polymers, this is actually a very interesting topic. We had a question come in about

is PTFE a PFAS? And I immediately looked at the structure and said, hmm, you know, by convention, polymers do not have the terminal lines listed, and therefore you can't actually apply the moiety test, because you don't know how it terminates. I did a lot of research on this topic. PTFE indeed does often terminate in CF3, but not always, so you can't actually apply the moiety test.

I'll also note polyvinyl fluoride is include by -- included by Buck -- polyvinyl fluoride, as a PFAS, I will emphasize. This does not even have a single fully fluorinated carbon, but it meets their definition of fluoropolymer and therefore they're indicating that fluoropolymers are PFASs. So that's also a little interesting point.

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MS. HOOVER: Here are some more examples. Here, I've shown two examples of aromatic chemicals. We consider these excluded, because it's very clear that Buck et al. requires them to be aliphatic substances, so aromatics are not included. Here's another somewhat interesting example. Again, most people would say this is out, because it doesn't have the moiety. However, it meets the definition of a perfluoroalkyl substance in every way. It has the hydrogens replaced by fluorines except on the functional groups.

So again, the problem we're now -- this -- hopefully, in this very brief talk, I've illustrated some of the problems with using Buck and the definition, even summarizing the definition and making sure that we're not too restrictive in understanding what's in and what's out.

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MS. HOOVER: So that brings us to our first interim step that we want to implement, and that is to clarify the current PFAS footnote. Here, you can read on your own the current language on both our designated and priority listed is here. Over the years, we've actually altered this definition for clarity. This is very clear, but now that we know the moiety is not necessarily a strict criterion, we think this is too restrictive. So we're proposing simplifying it for now just to refer to Buck et al. for the description of PFASs and example members of the class.

Obviously, that's not a solution that's going to be viable going forward, so we want to do more. And that is, we'd like to evaluate definitions of PFASs from other groups. OECD is commonly cited. There's a lot of literature where people have proposed different things. We also got some interesting public comments that Ulrike will paraphrase shortly and we'll be looking at those.

We could consider adapting some very simple

language that are being used in bills, one example is shown here. And something that I've been heading towards, and I've talked with Kathy Durkin about, is could we develop a definition that really addresses our Program needs and priorities. For example, we could keep a reference to Buck et al. to make sure we retain all currently listed PFASs, including specified polymers in Buck et al., and then add a phrase to expand the definition to ensure that we capture all the relevant fluorinated chemicals that are not currently included by relying on Buck et al.

And so this is not necessarily an easy path either, but it's something that would be great for you all to think about and provide us suggestions on, both the Panel and the public about what would be the things we'd like to capture. Obviously, we would think aromatics would be important to capture. There are other things that are missing by relying on Buck. And as we've all talked about in the past, our class approach has been to be inclusive, to try to be inclusive, to allow us the broadest flexibility in what we measure, because we are not a regulatory program. We are an exposure-based program, and the list of designated chemicals is really a lab list you can measure. That's why we favor being more inclusive instead of less inclusive.

Now, I also just wanted to note that Veena Singla has raised the idea of include -- considering functional descriptors, if there are concerns about being overly broad and including things that maybe people don't think should be included. So that's an option that we could consider.

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MS. HOOVER: So today, all we really want to hear about is any input on the simplification - that's just the interim step - as well as suggestions on what directions you'd like us to go in terms of our further research.

And now, I can take some questions, if people have them.

PANEL MEMBER LUDERER: Thank you, Sara.

Looking to see if we have any raised hands.

MS. HOOVER: Oliver, was that a raised hand? It came down.

PANEL MEMBER FIEHN: Yes. Yes.

PANEL MEMBER LUDERER: Okay. Oliver, yes.

PANEL MEMBER FIEHN: Yeah. I wonder a little bit about the -- you know, I do understand the idea of class definition. And the PFAS alkyl -- alkylated PFAS are already defined as a class. If we now use partially fluorinated aromatics and add them to it, I wonder if possible biological mechanisms or hazard potentials are

even related. So at this point, I am a little -- I would like to see a little more data to say, yeah, you know, the fluorine -- because the fluorine -- the fluorine atom itself is not -- I don't think it's actually the problem, right, unless somebody shows me the data, right?

So if something has an aromatic with a fluorinated methyl group on it, I'd say yeah, you know, I think it's still different to an alkylated polyfluorinated alkylated compound. So that's -- unless, I -- unless there's clear data that says exposures and, you know, hazard potentials are some of it.

MS. HOOVER: So I want to just say, yeah, thank you. I acknowledge what you're saying Oliver and I -- I did want to clarify that if we were to bring back a proposed change, that would be a voting item. And there would have to be a document written to justify that change, so, yeah, you're right. It would have to still meet the criteria and the Panel could decide. Now, again, we don't have to meet every criterion for designated chemicals, because it doesn't necessarily have to be shown to be toxic. It could just be an exposure concern. So we have some flexibility in our law, because it's not regulatory, so just keep that in mind.

PANEL MEMBER LUDERER: Carl.

PANEL MEMBER CRANOR: A quick question. It's

a -- in a way, it's a follow-up to Oliver's. Does anybody yet have enough information about the things in this class to push them toward more toxic, which would be more worrisome, and less toxic, and so forth, or is it all so new that you can't say much about it.

MS. HOOVER: It's definitely not --

PANEL MEMBER CRANOR: There's been --

MS. HOOVER: It's definitely not all so new. There's legacy PFASs, which obviously are of great concern.

PANEL MEMBER CRANOR: Yes.

MS. HOOVER: You know, I don't really have more comments than that. There's definitely a lot of PFASs that have not been studied, maybe not even the structure characterized fully, that sort of thing. So there's a -- there's a -- it's a huge class of compounds, but others -- Eunha, I see you're showing your camera. If others want to comment on that, please -- please feel free.

PANEL MEMBER LUDERER: Eunha, do you have a comment?

PANEL MEMBER HOH: Yeah. I think Carl was the first, I think.

PANEL MEMBER LUDERER: I think that was -- was that your comment, Carl?

MS. HOOVER: That was Carl's comment. So we're

asking you if you want to respond to his question about toxicity. Is that why you showed your camera? If not --

PANEL MEMBER HOH: Yeah. I mean, it's more like a -- it's more like a broad question, you know, that the -- it's such a -- I mean, because now we're finding more and more fluorinated organic chemicals, because of the events among the -- of the analytical methods. And then the toxicity data is not necessarily following up, you know, the catching up, the finding of the new fluorinated chemicals. You know, so I'm -- I'm just wondering if June-Soo isn't really an expert in -- in the non-targeted also targeted way of fluorinated analysis. I kind of wonder if he -- if he's here, he can be kind of -- I'd like to hear what -- his thoughts about it.

MS. HOOVER: Well, we've -- we've conferred with DTSC, Sabrina, June-Soo, and Safer Consumer Products. Certainly allowing for a broad screen is one argument in favor of a broad class, right? So if we do un -- non-targeted screening, you're going to be capturing a whole bunch of fluorinated chemicals as you say beyond what we're even aware is out there. And I think that was commented on in the November meeting about some -- you know, there's a big chunk of organofluorine that we don't even necessarily know what it is. So that's really what I was speaking to.

But I just did want to make sure, Carl, did we chop you off before you finished your comments or was that your main question?

PANEL MEMBER CRANOR: I mean that helps. I guess I was concerned -- there's a -- there's broad scale screening because there's concern about what these things can do when people are exposed to them. But if the screening is too broad, does it waste time, or waste resources, or mislead you, as to what needs to be done.

MS. HOOVER: Well, I mean, I guess I'm going to answer that in two ways. One is if we have a broad listing, we don't have to measure everything on the list. So concerns about oh, but, if you do a broad listing, and then you get pharmaceutical and you get all these things that are irrelevant, not to say that pharmaceuticals are necessarily rele -- irrelevant, because they're also an environmental hazard of concern that we've talked about at past SGP meetings, but just having something on the list doesn't make us have to measure it. It just allows us to be broad. So I think that's an important thing to keep in mind.

I think that to me screening is always useful. It doesn't necessarily give you answers, but I think it's fascinating to do a broad screening, you get a chunk that you don't know what it is. That's an important piece of

information in and of itself to me.

Anyone else on this topic?

PANEL MEMBER CRANOR: Thank you.

PANEL MEMBER LUDERER: I mean, I would just, I mean, put in a -- also a word for, you know, I think having a broad classification is useful, because we don't -- as you said, there's so many -- we don't even know what they are. We don't know what the toxicity is and that provides flexibility, you know, as more information becomes available. So I would be in favor of that.

Any other comments?

Tom.

PANEL MEMBER McKONE: Well, I just -- I mean, I want to speak in concurrence with that position that -- I mean, there's -- there probably could be nothing more troubling that could happen is if we restricted the definition in some way, and then another compound comes along, which might have been in the class, but we were restricted, and it's toxic, and it's ubiquitous, but the State and others can't deal with it, because it's not included in a list. You know, I mean, I think it makes sense to keep it broad and not restrict.

I mean, I think we should be working -- and again, the point is is that -- and people misinterpret

this, when we put out a class of chemicals, we're not saying they're toxic or harmful. What we're saying is that this is a class of chemicals in which there are issues of concern where the exposures are going up, some members of the class have been demonstrated to be toxic, so it gives -- so putting the class out gives, you know, everybody involved the opportunity to have a broad list of chemicals to work with and they don't have to measure all of them. Just it's a reverse -- it's much more problematic.

MS. HOOVER: I'm thinking, Ulrike, this might be a good time to read the paraphrased public comments in the Chair's agenda, and then we have a few attendees that want to speak, so we can bring them into it.

PANEL MEMBER LUDERER: Okay. I do see that Carl had raised his hand. Carl, did --

MS. HOOVER: Sure. Carl, if you have a quick thing and add on to this.

PANEL MEMBER CRANOR: Yeah, quick thing. In favor of -- of a -- of a broad definition. If you pick up something that's suddenly on the increase that you hadn't anticipated, you might -- that might be a reason for looking -- looking into it by the agencies or people that worry more about the toxicity.

MS. HOOVER: Exactly. And that was -- I think

Tom said it really well. There's multiple criteria for putting something on our list. They don't all have to be met. You may remember we always say those criteria are not joined by and --

PANEL MEMBER CRANOR: Right.

MS. HOOVER: -- so that's an important consideration.

PANEL MEMBER CRANOR: Right.

MS. HOOVER: Okay. Back to you, Ulrike.

PANEL MEMBER LUDERER: All right. Thank you, Sara. So the -- what I'm going to do is that we received two public comments on this topic before the meeting, and so now I'm going to just paraphrase those public comments.

So the first one was from Stephen Brown a PhD chemist leading the Sierra Club's PFAS Grassroots Action Team, who submitted a comment as a private individual on the topic of, and this is a quote, "Defining PFAS as a chemical class, which is necessary for regulations to protect public health, given the impossibility of adequately testing let alone measuring all the PFAS compounds released into the environment for decades," closed quote.

He provided recent online summary of this issue prepared by the European FluoroCarbons Technical Committee. And the link to that is available on the March

SGP meeting page.

Stephen also stated that quote, "I would opt for the definition provided by Denmark, Germany, the Netherlands, Norway, and Sweden in the PFAS Registry of Intentions, ROL, which is mostly -- most restrictive, but which may not be accepted ultimately by OECD. Manufacturers will prefer consistency worldwide, so the OECD definition would be acceptable, if it isn't revised per the ROL proposal. The California SB 1044 definition would lead to ambiguity," closed quote.

The second comment is from Amy Kyle, Associate Adjunct Professor at UC Berkeley, who recommended that OEHHA ensure the PFAS definition reflects the evolving understanding of this diverse and ubiquitous class, write up an analysis of the strengths and weaknesses of various approaches for defining the class, consider the PFAS definition used in SB 1044 as it is increasingly being used in California legislation and elsewhere and consider which definitions would be most functional for addressing compounds that are not fully characterized. So --

MS. HOOVER: And before we move on, I just want to correct. It's not ROL, it's ROI, so --

PANEL MEMBER LUDERER: Oh, Ro -- oh, yes, Intentions. Got it. Sorry.

MS. HOOVER: Just -- just for the --

PANEL MEMBER LUDERER: I was like why is it ROL. Sorry.

MS. HOOVER: You can't tell with that font. Sorry about that.

PANEL MEMBER LUDERER: All right. Thank you.

MS. HOOVER: Okay. And now I'm going to suggest -- oh, I see Carl has his -- do you have a hand up regarding those comments, Carl?

PANEL MEMBER CRANOR: (Shakes head.)

MS. HOOVER: Okay. So why don't we go ahead and proceed to the other comment. I think, Cheryl, you got one and you also have attendees to call on. So please -- please take over.

DR. HOLZMEYER: Yeah, there's two comments in the Q&A. Stephanie, did either of these commenters want to speak themselves?

MS. JARMUL: Sure. I can go ahead and start with the attendees who have their hands raised. And we can start with Amy Kyle. I'm going to unmute you and so you should be able to then unmute yourself and speak. And next, we will we go to Avi Kar.

DR. KYLE: Thank you. I didn't realize, I had actually figured out how to raise my hand, so this is extra special.

It's nice to see you all here and I am so glad

that this great group is thinking about this issue. And you read my comment that I sent in yesterday, so I won't repeat that, but just maybe emphasize the special needs of compounds like this that are really, I think, so important, because they're everywhere and they're toxic, some of them, at very low levels. And yet, we don't know what all of them are, and we can expect the mix of them will continue to change.

And so how can we define that, you know, that it's kind of a rolling situation that we want to be able to understand as much of it as we can as we go along, even though what was true last year won't be true next year.

So -- so it's -- it's an unusual kind of problem I think. And a lot of us -- I've talked to some other people working on this issue who are delighted that OEHHA is thinking about this and the Science Panel.

The other thing I wanted to say is there's also the components of the persistence and mobility of these compounds that are related to why there's such a concern. So it's partly the health effects, but also because some of them may never break down. And so I don't know if that needs to factor into the definition, but I think it needs to factor in how we think about them, and how we decide whether they're important or not, because that -- you know, this stuff is showing up in water and it's showing

up in people. And if it's as persistent as some people think they -- that it is, it will only continue to get larger overall, though the exact compounds may change as the industry changes what it uses. So there are some unique challenges here.

And I thank you and Sara for taking this on. Thank you.

PANEL MEMBER LUDERER: Thank you, Amy. Did the other two Q&A folks -- oh, they want --

MS. HOOVER: Yeah, I think we have -- right, we have both Q&A. So I was clarifying that with Stephanie. I think there's maybe other attendees who have raised their hands, so...

MS. JARMUL: Yeah. We have an Avi Kar, if you'd like to speak.

MR. KAR: Yes. Thank you and thank you for this discussion, for the opportunity to comment. My name is Avi Kar. I'm an attorney with the Natural Resources Defense Council. And I worked on SB 1044, which is one of the definitions under discussion here and I wanted offer a policy perspective for this discussion to the extent that it's helpful.

We urge the Panel to consider consistency with existing definitions, because the 1044 definition is used at -- it's in use in multiple California laws and it's

also in use in more than 10 different states that same definition. And the other one that we think is in widespread use is the OECD definition that's been referenced.

And to avoid confusion, we think it's helpful to have a consistent definition or a consistent set of definitions that are in use. And to the extent that Biomonitoring California is seeking to specify the PFAS that it monitors for, as the discussion has indicated, that can be done separately from the definition. And so we're urging -- keeping that in mind, especially because of some of the considerations that have been outlined earlier, which is about regrettable substitution and regulating a limited set of PFAS, if their definition isn't quite consistent with what's out there in the broader usage, the potential for other kinds of PFAS to come into play.

So I hope you take it in the spirit of the policy perspective. I obviously am not a scientist and can't offer a scientific perspective on it. So thank you for the time and thank you for your attention to the issue.

MS. HOOVER: So Avi, and others, and Amy, I want to emphasize that although it appears that the 1044 definition is very broad, that's what I was trying to highlight in my talk. There's chemicals listed in Buck

that would not meet that definition. So that's what we're looking at. We're looking at wanting to retain what we're -- what is already listed and then broaden from that.

If we -- so -- and there is -- there actually -- there's so much confusion and difficulty when you start to -- everybody has a different opinion about how to deal with this. If we keep Buck and broaden Buck, I think we're going to be broader than anybody truthfully. Like, that's where I'm leaning towards. I might be wrong. I haven't delved into it. But you've got to remember that you're going to lose fluoropolymers, if you go with your fully fluorinated carbon definition, at least the way that Buck defines polymer.

So that's just something to remember. We're not trying to keep our definition restrictive. We're actually trying to look at the most practical way to broaden it. I'll say that and pass it back to Stephanie and Cheryl for other commenters.

MS. JARMUL: Okay. Yes. We received two comments in the Q&A, but both commenters now have their hands raised, so I'm going to first call on Nancy. You should be able to unmute yourself. Nancy Buermeyer.

MS. BUERMEYER: Hi. Thanks very much. Appreciate the opportunity and it's always good to see the

Panel at work. Been obviously a long-time supporter and fan of all the things that the California Biomonitoring Program does.

I just wanted to reiterate what I said in the chat -- or in the Q&A, which is that broad is really important. Certainly, I, you know, work with Avi a lot and we have used that definition. And the consistency is one piece of it, but the list that you guys defined is also used in other ways in California Legislature, specifically in a couple of the disclosure bills around cleaning products and fragrance. And that some -- those lists sometimes get replicated in states -- in other states, or at least the potential is out there.

So the broader you define it, the more disclosure we get, and that's super important. And it is really important to us that the polymers be included. Like PTFE has to be included in these bills, because so much of the products that we're concerned about use PTFE. Particularly like the cookware bill that we did last year, which it was a bill that banned PFAS in food packaging, but disclosed it in cookware.

So those are super important things to keep in mind. I also don't understand the science, so that -- that part I leave to you all.

MS. HOOVER: Let me tell you, it's complicated.

So I'm just saying that. But I also will point out that PTFE does have a fully fluorinated carbon, so it would be captured under that definition. I was referring to the other example that I showed --

MS. BUERMEYER: That is excellent news.

MS. HOOVER: -- which would be lost. But this is exactly the kind of thing that we're going to look at. Like if we go this option, what do we gain, what do we lose, et cetera. And definitely, as you know, you know, we were pioneers in the class approach, and we're definitely in favor of being inclusive.

Go ahead, Stephanie.

MS. JARMUL: Okay. Next, we have Renée Sharp.

MS. SHARP: Okay. Can you hear me?

MS. JARMUL: Yes.

MS. SHARP: Great. Thank you all for having this discussion today and for allowing us to provide public comment. My name is Renée Sharp and I am a scientist with an NGO called Safer States, however I'm not a chemist, so -- and sometimes I think that when you come to these really wonky questions, I'm wishing I was a chemist.

But my -- my comment is consistent -- consistency really is very helpful. And, you know, echoing the comments of some other earlier commenters, you know, using the definition that's used in the California bills or

laws, and also used in other states, or using that more recent OECD definition can be very helpful.

That said, we are also very interested and feel that it's very important to have the definition be broad as possible for all the reasons why several of the Panel members mentioned, making sure that if something comes up, that you're not hamstrung kind of by accident or by intention to being able to actually take action to monitor for that compound or otherwise address it.

So given that, if -- if you think that, you know, either the definition in the California legislation or the OECD definition is not broad enough, I would encourage you to take one of those and start there and broaden it, rather than using Buck, because at this point, that Buck definition it's -- you know, it's 10 years old. And in the spirit of consistency, it would be better to kind of take an existing updated definition and kind of go from there, rather than kind of feeling like -- it kind of feels like you're kind of like taking an older one and then trying to improve upon it. And I think that would be -- it would just kind of be helpful for consistency and perhaps moving the field forward.

So thank you again. Very grateful that you all are considering these questions and appreciate your efforts.

MS. HOOVER: So, Renée, I will say I hear you. I acknowledge this point. However, actually, there's so much inconsistency even in the current literature including about OECD. There's issues in the OECD paper, where things are excluded that I don't think we would necessarily want to exclude. So it's actually really complicated. And this is something that we need to take a closer look at.

One of the main reasons I'm favoring -- keeping -- I know Buck is outdated. Everyone points that out, but Buck is where we started and it's foundational for defining this class. And it also has certain broad aspects that no other definition has. So that's where I was going with that.

Certainly, we can abandon that idea. We don't have to pursue it. We could talk about the definition in a different way and then have reference to many different papers. I mean there's lots of different ways we can go, but I just wanted to really -- that was an interesting point that I discovered and I was surprised by. And I -- we actually -- I will also say that Kathy Durkin reached out to Buck and we have not heard from him yet, but we definitely will be trying to confer with him as well about his thoughts in this area and others, of course -- other stakeholders.

So, yeah, and again any additional comments, send us emails about your favorite definitions, or new language, or new papers. We'd love to hear it.

PANEL MEMBER LUDERER: Okay. Thank you. I don't believe that there are additional public comments. If there are, please raise your hand, or -- in the chat. So I'm not seeing anything. Any additional comments from Panel members?

MS. HOOVER: And let me just chime in with one question, and that -- Oh, Tom, you can go, but remember, I'm planning to do this interim fix, so that we're not restricting Buck to only things with the moiety. So I -- I'm just going to assume. I haven't heard anybody object to that interim fix, but -- and that's not a voting item. We're going to make some clarification, but if anyone has thoughts on that, we'd like to hear it. But go ahead, Tom.

PANEL MEMBER McKONE: Oh, you made a key point. So we kind of came into this and I had a sense that we have Buck, an older version, or we have something and then there's other options. And it felt like, well, can we -- we either had to keep what we had and stick with that paper consistently or go to something else. But now it looks like we can start with that Buck paper and then come up with some -- maybe the Panel can do this, but just some

guidelines about how to expand it.

So, you know, there's no reason, right, that we couldn't have three working papers and -- and use that to -- to have the broader one, because I don't --

MS. HOOVER: Yes.

PANEL MEMBER McKONE: -- like that concept that we're going to say, oh, here's Buck, then we're going to go OECD, and then we're going to lose a bunch of compounds, even though we're going to gain some other ones.

MS. HOOVER: Exactly.

PANEL MEMBER McKONE: I mean, that's a really, I think, dangerous game actually to play. And the best game -- or the best way to do it is to kind of build a portfolio of documents that support the choices we have and then maybe vote on that or something at some point, if we have to.

MS. HOOVER: Exactly. Exactly.

PANEL MEMBER McKONE: Okay.

MS. HOOVER: That's my vision, Tom.

PANEL MEMBER McKONE: That really makes sense.

MS. HOOVER: Thank you for that. Thank you for saying it perhaps in a clearer way than I was saying it. And I do want to say that one issue that -- one thing that I really am aware of, and this is I think a point that

others have made as well, that I don't want the situation, which we've been in many times over the years, where someone hands us a chemical and said is this in or out? And there's not enough clarity in Buck et al. to make that determination necessarily. I could argue this is in, someone else would say it's out.

So that's the other goal is to clarify, okay, all of these things are definitely in and you can look at the structure. You don't have to go to a paper and figure it out yourself. You can just figure it out based on our guidance, is it in or out? That's the goal of the guidance we'd like to issue on the definition, which will be voted on by the SGP.

PANEL MEMBER LUDERER: Great. Thank you. I think we're just about at the end of our time to move on to the open public comment period, unless there's a -- any last comments from Panel members?

I'm not seeing any.

Then I think we can move on to the open public comment period. So there are 10 minutes allotted for the open public comment period, during which commenters can provide comment on any topic related to Biomonitoring California, not just the topics that we were talking about today.

And I did want to mention that -- well, I think

that Dr. Ahimsa Porter Sumchai of the Hunters Point Community Biomonitoring Program submitted three links as public comments. One is, "HP Monitoring: Promising HOPE for Hunters Point." Another one is "HOPO: Partnering to Advance Therapy for Radiation Exposure," and "Quest to Detect Plutonium." And so those links are available on the March meeting page under the open public comment period.

And also, please, you can go ahead and submit written comments and questions via the Q&A function as people have been doing of Zoom webinar or by email to biomonitoring@oehha.ca.gov and we will read them aloud. If you wish to speak, please alert us with the raise hand feature in the Zoom webinar and we can also call on you as we have been doing.

So do we have any additional comments, people wishing to speak?

I'm not seeing any.

I'm not seeing any. Has any -- anyone else received any comments?

I don't -- all right. If not, then I think we can go ahead and wrap-up the meeting. So I wanted to announce that as always there will be a transcript of this meeting posted on the Biomonitoring California website, once the transcript is available. And also announce that

the next Scientific Guidance Panel meeting will be on July 22nd, 2022 from 1 to 4 p.m. and attendees will be able to join that via Zoom webinar or come to the Coastal Hearing Room on the second floor of the CalEPA building at 1001 I Street in Sacramento to participate in the webinar.

So I want to thank all the Panel members, and the Program staff, and the audience. And with that, we will adjourn the meeting.

(Thereupon the California Environmental Contaminant Biomonitoring Program, Scientific Guidance Panel meeting adjourned at 3:52 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 Environmental Contamination Biomonitoring Program Scientific Guidance Panel meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and 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 17th day of April, 2022.

JAMES F. PETERS, CSR
Certified Shorthand Reporter
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