MEETING

STATE OF CALIFORNIA

ENVIRONMENTAL PROTECTION AGENCY

AIR RESOURCES BOARD

SCIENTIFIC REVIEW PANEL

ON TOXIC AIR CONTAMINANTS

ZOOM PLATFORM

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

SIERRA HEARING ROOM

1001 I STREET

SACRAMENTO, CALIFORNIA

THURSDAY, MAY 12, 2022

9:31 A.M.

JAMES F. PETERS, CSR
CERTIFIED SHORTHAND REPORTER
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APPEARANCES

PANEL MEMBERS:

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Ahmad Besaratinia, PhD

S. Katharine Hammond, PhD

Michael T. Kleinman, PhD

Joseph R. Landolph, Jr., PhD

Karen Messer, PhD

Beate R. Ritz, MD, PhD, MPH

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APPEARANCES CONTINUED

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ALSO PRESENT:

Sarah Aird, Californians for Pesticide Reform

Caroline Cox, Californians for Pesticide Reform

Laura Rosenberger Haider

Jane Sellen, Californians for Pesticide Reform

Raymond Tompkins, PhD

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PROCEEDINGS

CHAIRPERSON ANASTASIO: Okay. Good morning, everyone and welcome to the Scientific Review Panel meeting. This is our first in-person meeting in over two years. Paul is joining us remotely. Although, I do not see Paul on the Zoom. I'm not going to let that stop us however.

In-person panelists, as Arash just said, you know, when you want to speak, just turn on your mic and speak. Our intrepid reporter, Jim, needs to get everything on recording, so please use the microphone and please speak clearly.

We're going to start this morning by introductions. So we'll just do a brief introduction, your name, your area of expertise and your affiliation.

So I'm Cort Anastasio. I'm Chair of the SRP. I'm an atmospheric chemist at the University of California at Davis.

Karen.

PANEL MEMBER MESSER: Good morning. I'm Karen Messer. I'm a professor of biostatistics at University of California, San Diego.

PANEL MEMBER KLEINMAN: I'm Mike Kleinman. I'm an inhalation toxicologist at -- and professor at University of California, Irvine.

PANEL MEMBER BESARATINIA: I'm Ahmad Besaratinia. I'm a professor of preventive medicine at USC Keck School of Medicine.

PANEL MEMBER LANDOLPH: Morning. Joe Landolph. I'm associate professor of molecular microbiology and immunology and a member of the cancer center. My expertise is in molecular carcinogenesis and genetic toxicology.

PANEL MEMBER RITZ: Good morning. I'm Dr. Beate Ritz from the Department of Epidemiology and Environmental Health Sciences, as well as neurology at UCLA, School -- Fielding School of Public Health and my specialty is reproductive outcomes, neurodevelopment, and neurodegeneration.

CHAIRPERSON ANASTASIO: Great. Thank you all. We also have, at some point joining us, Paul Blanc. Norm, maybe you could try to connect with Paul to remind him and send him the link again for the Zoom.

And then Kathy Hammond, who was planning to be in person but will be joining us remotely in just a few minutes.

All right. So a few administrative items for the skeleton crew we have in the room. Restrooms, drinking fountains, out the door to your left. If there's a fire alarm, exit down the stairs, proceed out the building.

Masks are recommended, but not required. It's nice to see all these masks. Masks and sanitizers are near the door in case you need anything.

Today's agenda, we're going to have one major item and three informational items. Arash, can you give us the agenda slide.

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CHAIRPERSON ANASTASIO: Excellent. Thank you.

So the major item is the 1-bromopropane reference exposure level document from OEHHA. And then we'll have three informational items, one from OEHHA about -- on a proposed process for hot spots chemical reviews, one from DPR on their emissions monitoring study of 1,3-dichloropropene, 1,3-D in the AB 617 community of Shafter. And then the last informational item will be an update by the Air Resources Board's Office of Community Air Protection program, OCAP.

Next slide, please, Arash.

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CHAIRPERSON ANASTASIO: Oh, is this the one that's supposed to have times? Okay. So every Panel member should have an agenda with times on it. I appreciate you keeping us on time. So let's try to keep -- do our best keeping to the time allotted for each item. Of course, if we have to spill over for important issues, that's fine. But otherwise, let's try to be efficient in our use of time.

Speaking of which, let's move right to our first item. The 1-bromopropane reference exposure level document.

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CHAIRPERSON ANASTASIO: So this document is from the Office of Environmental Health Hazard Assessment. And was available for public review and comment from January 7th through February 22nd, 2022. The document was sent to the Scientific Review Panel for review on April 12th, 2022. And today, we're going to hear a presentation from OEHHA staff on the development of non-cancer acute, 8-hour, and chronic inhalation RELs for 1-BP followed by a Panel discussion and feedback to the OEHHA staff.

So I'd like to now introduce Dr. John Budroe of OEHHA's Air Toxicology and Risk Assessment Section.

John.

DR. JOHN BUDROE: Good morning. And I'd like to in turn introduce Dr. Daryn Dodge, one of my staff, and he's the lead author on the 1-bromopropane REL document. And he'll be making the presentation to you this morning on the document.

Dr. Dodge.

DR. DARYN DODGE: Well, thank you, Dr. Budroe.

Okay. So this time around, we are going to talk about the non-cancer reference exposure levels that were derived for 1-bromopropane. If you recall at the last SRP meeting, we talked about 1-bromopropane, but that was for the cancer inhalation unit risk factor that we derived. So this time, it's the non-cancer portion.

Okay. Next slide.

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DR. DARYN DODGE: Some of these slides, well, will look familiar. The first couple of them are similar to the ones we had at the last meeting. 1-bromopropane is also referred to as n-propyl bromide, but in most cases you'll see it named as 1-bromopropane or 1-BP. It's a colorless liquid at room temperature. It's soluble in organic solvents and slightly soluble in water. Boiling point is 71 degrees Celsius and vapor pressure is 110.8 millimeters of mercury or torr.

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DR. DARYN DODGE: 1-bromopropane is listed as a carcinogen and as a developmental and reproductive toxicant in male and females under the California Proposition 65 Program. We have a draft hot spots cancer inhalation unit risk value that I just spoke of. It's been reviewed by the Scientific Review Panel and has been endorsed by the Panel. It's undergoing some revisions and is currently in our group being looked at at upper management. The uses of 1-bromopropane, the main use is as a solvent vehicle for adhesives in laminates and foam products. And it's used a degreasing cleaning agent for metals, plastics, optics, and electronics.

It is authorized for use as an alternate solvent for modified perchloroethylene dry cleaning machines in California. Although I believe it's use is very limited for this.

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DR. DARYN DODGE: We don't have much information on emissions in California. This is because it wasn't reportable under the Hot Spots Program. We did have a statewide survey that was sponsored by the Air Resources Board in 2011, where a total of 160.7 tons of 1-BP emissions occurred in the year 2008, primarily due -- or exclusively due to solvent cleaning operations.

However, as of March 21st of this year, it is now -- it is now reportable under the Hot Spots Program. Also, February 4th of this year, the U.S. EPA amended their hazardous air pollutant list to add 1-BP. And this hasn't happened in many years, that is adding a chemical to this particular HAP list.

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DR. DARYN DODGE: Metabolism of inhaled 1-BP in rodents is primarily through oxidative metabolism via P450 enzymes, conjugation with glutathione or debromination -- and/or debromination. In rats, the majority of the -- of absorbed 1-BP may be excreted unchanged or as carbon dioxide in exhaled air within four hours of end of exposure. Radiolabeled 1-BP is recovered in urine in the range of 17 to 23 percent. The main urinary metabolite excrete is N-acetyl-S-propylcysteine. And that constitutes about 37 percent of the total urinary metabolites. This metabolite is found in urine of 1-BP workers and it's been found in national biomonitoring studies of pregnant women and children.

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DR. DARYN DODGE: NIOSH, which stands for the National Institute of Occupational Safety and Health observed a strong association between time-weighted average inhalation exposure to 1-BP in workers and the urinary Metabolite N-acetyle-S-propylcysteine. So they considered this metabolite an effective biomarker in 1-BP workers.

Now, we have some national population studies as well or surveys. The National Children's Vanguard study found N-acetyl-S-propylcysteine and 99 percent of urine samples from nearly 500 third trimester pregnant women. We also have the NHANES study 2011-2012 where the mean urinary levels of this metabolite was 2.6 nanograms per ml in boys and 3.3 nanograms per ml in girls.

And they found them in -- found it in about, if I recall, 80, 90 percent of boys and girls in this survey. Now, this and some more recent surveys suggest widespread non-occupational exposure to 1-bromopropane. Although, exposure to other chemicals could result in the same urinary metabolite. I do have some recent studies that looked at metabolites in humans that are exposed to just general air pollutants or common emissions from facilities. And this particular metabolite N-acetyl-S-propylcysteine is not found in those particular studies. So, for now, it appears that the metabolite is pretty much only due to exposure to 1-BP, at least currently.

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DR. DARYN DODGE: All right. Talk about the acute effects in humans, non-cancer acute effects. We don't have a lot of data for an acute REL in humans. And we're talking about exposures of less than 24 hours. The acute REL is based on a 1-hour exposure. So what we do see is multi-day occupational studies where you begin to see neurotoxicity after several days to several weeks of exposure. So that's more of a subacute rather than an acute effect.

The neurotoxic effects noted in exposed patients include ataxic gait, hypoesthesia, which is partial or total loss of sense of touch, numbness, dizziness, ocular symptoms, and limb pain. There are some other symptoms, but these are probably the major ones.

Now, occupational exposure levels are hard to pin down. Mainly because by the time agencies get around to measuring the levels in facilities, where patients were exposed and poisoned by 1-BP. They had fixed whatever conditions resulted in the high levels, so we don't really know exactly what they were. But one scientist or researcher in the field estimated that exposures to greater than 50 to 200 parts per million for days or weeks can lead to the severe neurological findings that I just mentioned.

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DR. DARYN DODGE: Okay. And in experimental animals, there are also a few acute toxicity studies of -- and we're -- again, we're talking about exposures of 24 hours or less. We'd like to base the acute REL on a 1-hour exposure, but often we have to extrapolate from 68 hours of exposure in the animal studies.

What we -- again, what we do find is that multi-day exposure -- exposure, the protocols used by researchers they look at -- they want to do exposures several days to several weeks to achieve measurable neurotoxic effects. It's difficult to get these in a -- with a single exposure of a day or less. So in rats, I'm going to just give a sum -- brief summary here of the effects in rats. In rats, you do see ataxia at concentrations of 1,800 to 2,000 parts per million with a few daily exposures less than a week. But this could be due to just general CNS depressant effects that you see with a lot of organic chemicals.

However, at concentrations of 800 parts per million or more for a week has resulted in axonal myelin sheath swelling of the gracile nucleus and the posterior tibial nerve. Now the gracile nucleus is a nerve bundle that carries information about find touch and vibrations from the lower part of the body to the brain stem.

So we're talking about the peripheral nervous system. At concentrations of 200 parts per million or greater for three weeks, this resulted in decreased muscle strength of the rats.

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DR. DARYN DODGE: We also have some information about acute toxicity, subacute toxicity in mice. We have a little bit different story going on here. So with the 8-hour -- 800 parts per million or greater in mice for 6 hours, results in decreased sperm motility in males is part of the reason the Proposition 65 program notes that there's a reproductive effect in males and females at concentrations of 500 parts per million or greater.

This results in liver damage in the mice. Higher concentrations at around 1,000 parts per million or so can result in death by the end of day two of exposure. Also, in mice, you see respiratory airway lesions of the epithelium. This is observed at concentrations as low as 125 parts per million after a two-week exposure.

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DR. DARYN DODGE: We also have some developmental studies -- primarily one developmental study. Developmental abnormalities or anomalies in newborn rodents resulted from 1-BP exposure during gestation. This is considered an acute effect and this is because during gestation, there could be a sensitive point in development where just a 1-hour exposure could result in the developmental anomaly or abnormality.

So the Huntington Lice Sciences study from 2001, maternal rat exposure was 6 hours per day to concentrations of 0, 100, 498, and 996 parts per million during gestational days 6 to 19.

In the rat fetuses, on gestational day 20, they found reduced skull ossification at concentrations of 498 parts per million and greater, and an increase in bent ribs at 996 parts per million, the highest dose. We used this as the key study for the acute REL, because this was the most sensitive endpoint for acute exposure to 1-BP.

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DR. DARYN DODGE: Here in the table, we show the skeletal abnormalities in the fetuses that were exposed to 1-BP. The number of litters examined per dose group was 23 to 25. The number of fetuses examined was between 145 and 153. For reduced skull ossification, we have the fetal incidence there. That was increased at the two highest doses and same with the litter incidence, increased at the two highest doses. For bent ribs, the increase in -- the incidence of bent ribs increased at the highest dose of 996 parts per million. So we chose reduced skull ossif -- ossification as the critical effect for acute REL derivation.

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DR. DARYN DODGE: So we took the data from this study and modeled it in a benchmark dose program by U.S. EPA. We used the nested dichotomous analysis, so this -- we -- you know, we include the individual data here from each fetus, but the term nested means it also takes into account the effect or the incidence rate in each litter.

So our nested dichotomous model here applies a line to the data. We have dose on the X axis and response on the Y axis. And as dose increased, you get an increase in response for the reduced skull ossification.

Now, there's a -- there's a vertical orangish, reddish line there near 200 parts per million there. That is the -- at the benchmark response rate of five percent for this endpoint. And the benchmark dose falls there around 200 parts per million or a little under. And the purple-ish vertical line to the left is what's called the BMDL. This is the 95 percent lower confidence limit on the -- for the BMD.

That falls down at around 130, 131 parts per million. Next slide.

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DR. DARYN DODGE: So again, our benchmark dose response is five percent and that's equivalent to a benchmark dose of 187 parts per million. The 95 percent lower confidence limit, or BMDL, is 131 parts per million. 131 parts per million is what we chose as our point of departure for the acute REL. We did not apply a time adjustment for exposure during gestation, even though the exposures were 6 hours per day. And this is again because of the possibility that there's a very sensitive period during development where exposure for 1 hour could result in this particular response or anomaly.

We applied human the equivalent concentration and RGDR, which stands for regional gas dose ration of 1. And this is what we generally use for systemic effects.

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DR. DARYN DODGE: To our point of departure, we applied uncertainty factors. For the interspecies uncertainty factor, the toxicokinetic portion was 2, and this is for residual toxicokinetic differences not addressed by the RGDR. Our toxicodynamic portion is the square root of 10, or root 10. And this is for lack of toxicodynamic data.

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DR. DARYN DODGE: For our intraspecies uncertainty for, the toxicokinetic portion was given a 10.

This is because we have no information of pharmacokinetic differences for 1-BP among adults, infants, and children. The toxicodynamic portion was given a square root of 10, or root, 10, for this uncertainty factor. And this is because we use a sensitive time endpoint development as -- as a point of departure.

So in other words, we used root 10 rather than 10 for this uncertainty factor. The cumulative uncertainty factor is 200. So our point of departure of 659 milligrams per cubic meter, or 131 parts per million, is divided into 200. And this results in an acute REL value or proposed acute REL of 3.3 milligrams per cubic meter, or 3,300 micrograms per cubic meter. And this is equivalent to where -- it's 3.3 milligrams per cubic meter is equivalent to 0.7 parts per million.

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DR. DARYN DODGE: Now, I'll go on to the chronic and subchronic effects and we'll start with experimental animals. Now, to briefly summarize here, the neurological studies in rats, there's several of them in the literature. And the exposure are 8 to 12 weeks, generally more of them were 12 weeks in length. The exposures are generally 6 to 8 hours per day, 7 -- 5 to 7 days per week. This kind of protocol was used to find neurological effects or measurable effects. So at concentrations of 400 parts per million or greater, you see increased distal latency of the sciatic nerve.

Distal latency is essentially a delay when you have a stimulus at -- for example, at the end of the tail. You apply electrical stimulus, and then at the base of the tail, you measure how long it takes for that electrical stimulation to reach the base of the tail. It doesn't necessarily follow the sciatic nerve. It could take other paths on its way. But anyway, the time it took to get from one end to the other was increased.

Along with this, at this same dose level, 400 parts per million or greater, there was a decreased forelimb strength. This is measured by hanging the rat off a bar by their hind legs and seeing how long they hang.

Histopathology. The find axonal degeneration and demyelination nation. So these effects is what result in a increase in the distal latency. At 800 parts per million or greater, there's a decreased motor nerve conduction velocity, also due to the demyelination in and damage to the nerves.

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DR. DARYN DODGE: The National Toxicology Program had a two-year study in rats and mice. This was primarily to look at the carcinogenic action of 1-bromopropane. But they also record non-cancer effects. Now, they did not find apparent lesions in the nervous system, but they were mainly looking at the brain and spinal cord. I don't think they were looking at the peripheral nervous system and the nerves there. So they may have missed some injury to the peripheral nervous system.

What they did find was respiratory -- respiratory tract lesions in mice at the lowest dose of 600 -- or 62.5 parts per million. Another interesting thing that they -- or endpoint that they found in rats was what's called Splendore Hoeppli material. I'm not sure if I pronounced that correctly. But these are abscesses that were found primarily in the nose and skin of exposed rats. And this is often considered to be evidence of immunosuppression or a result of immunosuppression.

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DR. DARYN DODGE: So in humans, subchronic and chronic effects, the effects are similar to what I described for acute and subacute. But we're talking about exposures at lower concentrations over a longer period of time, you say -- you see the neurological effects dominate over any other possible effects to tissues and other organs.

The neurological effects include numbness of the lower limbs, decreased pallesthesia, which is a decreased sense of vibration, unstable gait, and difficult walking.

We have several occupational studies that performed nerve conduction tests. The most common finding was reduced conduction velocity and increased distal latency in the peripheral motor and sensory nerves of the lower limbs.

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DR. DARYN DODGE: So in a case report by Sclar, 1999, there was a patient hospitalized following two months of exposure to nearly pure 1-BP. We don't know what the exposure concentration was, but it could have been in the hundreds of parts per million. This was one of the first nerve conduction exams of a patient poisoned or exposed to 1-BP resulting in the symptoms that I described on the previous slide.

So the sural and peroneal sensory nerves were measured and there was a decrease in conduction velocity sural, 29 to 36 meters per second, which is well below the range of normality, which is 40 to 41 meters per second. Motor dis -- nerve distal latencies were also measured. And those were in the area of -- in the range of 8 to 9.6

milliseconds. And this is well above the normal range for these nerves of 6.1 to 6.5 milliseconds.

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DR. DARYN DODGE: Now, there was a series of studies from China by Li et al. And we used this as the key study for the chronic and 8-hour RELs. I this study, they looked at 71 female workers from four Chinese 1-BP manufacturing plants. This is one of the largest cohort of 1-BP workers studies. They compared it to a control -- control group of 71 female workers from the same region, but in industries in which they were not exposed to 1-BP.

Geometric mean concentration that the workers were exposed to was 14.13 milligrams per cubic meter or about 2.81 parts per million, mean duration was 38.8 months.

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DR. DARYN DODGE: These are the results for nerve conduction and distal latency tests conducted by Li et al. So for tibial nerve distal latency, there was a statistically significantly increase in the distal latency of 1-BP exposed workers compared to controls.

For the tibial motor nerve and the sural sensory nerve conduction velocity, there was a statistically significant decrease in conduction velocity in the 1-BP exposed workers compared to controls. Now, for conduction velocity, this was when -- within the cutoff of normality for both groups the 1-BP exposed and controls. They were still within the range of normal -- what's considered normal for humans. However, if you notice that the distal latency is increased both for control and 1-BP above the range of normality. And this could be really due to testing differences, or methodology differences, or environmental differences that result in both groups being above the cutoff.

For example, if the workers and controls were measured when their skin was colder, this would slow the -- or this would slow the -- this would slow the -- or cause the increase in distal latency.

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DR. DARYN DODGE: There should be a slide before this -- should be another table. Okay. So these are the results for pallesthesia. So compared to controls the 1-BP workers, there was an in -- statistically significant increase in the vibration threshold measured in decibels in the left foot, but apparently not the right foot. It wasn't explained why there was a difference here.

For a vibration delay, measured in seconds, there was an increase in the delay of 1-BP workers compared to controls. For controls, it was about three seconds and for 1-BP workers it was about six seconds, so about three seconds longer. Now, the way they measure this is the examiner or physician takes a tuning fork -- vibrating tuning fork and applies it against a specific part of the ankle or foot of the worker, and that the worker tells them when they can't feel the vibration any more and the examiner quickly moves it to his or her foot in the same spot to see how much longer the examiner can feel the vibration. So it was three seconds longer in controls and six longer in 1-BP workers.

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DR. DARYN DODGE: So as I mentioned several slides before, we used the Li et al. study from 2010 as -- for the point of departure. It was a critical study. The point of departure being 14.13 milligrams per cubic meter. To this number, we applied a time adjustment of 10 cubic meters over 20 cubic meters. And this is because 8-hour working exposures are thought to result in half the air breathed by a person during a 24-hour period.

So for a 24-hour period, you breathe 20 cubic meters of air. For a working active 8-hour period, you breathe half of that, or 10 cubic meters. We also have a time adjustment of five days over seven days. The workers were working up to five days. And in our guidelines, we use seven days for the chronic REL derivation. This resulted in 5.5 -- 5.05 milligrams per cubic meter.

Now, we apply the uncertainty factors. We have a LOAEL uncertainty factor -- that's lowest observable adverse effect level. We apply an uncertainty factor of square root of 10. This is for subclinical findings in the 1-BP exposed workers. In other words, they didn't realize they were at a reduction in conduction velocity of their nerves. They didn't realize that their vibration sense was reduced, so we -- this is what the researchers called it, subclinical results.

So with apply a subchronic uncertainty factor of 10. And this is because the exposures -- the average exposure was 38.8 months. And this is less than eight percent of estimated lifetime. So in this case our guidelines say to apply a un -- subchronic uncertainty factor of 10.

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DR. DARYN DODGE: Total interspecies uncertainty factor is 1. Because this is a human study, we have no extrapolation from animal to human.

The intraspecies uncertainty factors though, which looks at the range in variability within a human population, the toxicokinetic portion we gave a full 10. This is to protect infants and children. And the intraspecies toxicodynamic portion is also 10. This is because we consider neurotoxicity a critical effect.

Cumulative uncertainty factor was 3,000, which is at about the limit that we would consider using an uncertainty factor of this size. The chronic REL is 5.05 milligrams per cubic meter, divided into 3,000 resulted in a chronic or proposed chronic REL of 1.7 micrograms per cubic meter or 0.3 part per billion.

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DR. DARYN DODGE: Our 8-hour REL is based on the same occupational study that we use for the chronic REL derivation. So the same point of departure of 14.13 milligrams per cubic meter. Where the difference comes is in the time adjustment. So we don't have a 10 cubic meter over 20 cubic meter adjustment in there, thus our 8-hour REL is basically double the chronic REL value. All other -- all other uncertainty factors are the same. So our proposed 8-hour REL is 3.4 micrograms per cubic meter or 0.7 part per million.

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DR. DARYN DODGE: In summary, these are our proposed 1-BP RELs. The acute is 3,300 micrograms per cubic meter, the chronic and 8-hour are 1.7 and 3.4 micrograms per cubic meter respectively.

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DR. DARYN DODGE: We had a workshop where we presented this to the public several months ago. The 1-BP REL document was released for a 45-day public comment period on January 8th, 2022. And during this time, we had a public present -- presentation that was held on January 26th, 2022. It was held virtually. We had no public comments received on the document.

So normally, at this point, I would be going over the public comments, but since we don't have any, that concludes the presentation.

CHAIRPERSON ANASTASIO: Great. Thank you very much Daryn.

So our leads for this were Mike Kleinman and Kathy Hammond. So I'd like to start with that and let's see if we can't get Kathy remotely first. We'll start with Kathy. Kathy, can you say hi to us?

Kathy, we can't hear you. I can see that you're not muted.

Victor is trying to work on it.

Oh, Kathy, it looks like you might be muted. Can you unmute yourself?

We're still not getting anything, Kathy.

The only other remote panelist was going to be Paul, but he's not on.

PANEL MEMBER HAMMOND: Can you -- can you hear me now?

CHAIRPERSON ANASTASIO: Oh, there we go. All right. Perfect

PANEL MEMBER HAMMOND: You can hear me?

CHAIRPERSON ANASTASIO: Yes.

PANEL MEMBER HAMMOND: Okay. Sorry. Technical difficulties. Sorry. Sorry.

CHAIRPERSON ANASTASIO: Okay. Good. It's good to have you with us. Kathy, go ahead.

PANEL MEMBER HAMMOND: Yes. Great. Okay. First of all, I want to commend you all for tracking down these articles in Chinese and getting those translated. It added tremendously to the database with which you worked. And I think we need to be doing more of that. And I've been trying to do that like with my IARC meetings. And I'm just really happy to see that. I just think that's excellent. And I know that that's a lot of work, so thank you for doing that.

And my -- all my other comments are really quite minor. I think it's a good report. I would suggest that wherever you're talking about air concentrations, you make it clear it's air. Most places it is, but there are places that aren't a few. And also that when you give concentrations, you report either ppb or ppm, as well as the micrograms per cubic meter metric. But I think particularly for these materials ppm or ppb is a more common thing, so those should be included in doing that.

Let's see. So I was interested in Table 12 that it appeared that the lowest observed advast effect -- adverse effect level was between 1 and 3 ppm on page 48. Many of the outcomes were less than 7 ppm, but the chronic REL comes in at just -- at a tenth of that 0.7 ppm. So it's actually on the order of just even only half of where there's a LOAEL, no even a NOAEL. I was curious about that. I don't know if you have any comments there.

DR. DARYN DODGE: I'm sorry. Kathy, could -- is this --

PANEL MEMBER HAMMOND: Say that again.

DR. DARYN DODGE: Oh, could you repeat comment. I was --

PANEL MEMBER HAMMOND: Sure. On Table 12, for instance, on page 48 -- let me pull mine up.

DR. DARYN DODGE: Okay. Yeah, I've got it here now.

PANEL MEMBER HAMMOND: Okay. I'm noticing that the LOAEL, lowest observed adverse effect level, for instance, I'm just looking in general here --

DR. DODGE: Oh.

PANEL MEMBER HAMMOND: -- is like 1 -- this is the effects in humans.

DR. DARYN DODGE: Okay. You -- I'm sorry. I see what you're looking at now. Yeah, that's a typo. It should be 2.81. Not 1.28.

PANEL MEMBER HAMMOND: 2.81. Okay.

DR. DARYN DODGE: Wait. Oh, this is for Li et al. 2010a. I'm sorry. This was -- okay. This was another study by Li et al. looking at many of the same workers, but I decided not to choose that study, even though there was a LOAEL. This is because they divided the -- the workers into three groups based on --

PANEL MEMBER HAMMOND: Um-hmm.

DR. DARYN DODGE: -- based on their level of Exposure.

PANEL MEMBER HAMMOND: Right.

DR. DARYN DODGE: Their level of exposure was determined over one or two days of personal measurements. And then they go on to say that at least -- I can't recall if it was in this paper or one of the other Li et al. papers, but they go on to say that the workers are often rotated on among the various jobs. So --

PANEL MEMBER HAMMOND: Yeah, I saw that.

DR. DARYN DODGE: So what I gathered from that is that over time their exposures are all going to be very similar, because they're being rotated among jobs where some exposures are less than others and others have -- are more or a little higher in 1-BP. That's why I chose Li et al. 2010b, which grouped all the female workers together, because I think over time their exposures are all about the same. Does that make sense?

PANEL MEMBER HAMMOND: Well, again, let's list as the -- well, what's listed for that then, for 2010b, the LOAEL is still 2.81, right, ppb -- ppm.

DR. DARYN DODGE: Right. Right, that -- right.

PANEL MEMBER HAMMOND: Right. And I guess what I'm trying to say is if you go on to the next page, there's a NOAEL of 1.2 a LOAEL of 4. My concern is that there's not much safety margin here between a LOAEL and the actual value that you chose of 0.7.

DR. DARYN DODGE: You think the uncertainty factor that we had in there was not high enough? It's --

PANEL MEMBER HAMMOND: Well, I mean, when you have -- I didn't go -- I didn't take it from that perspective.

DR. DARYN DODGE: Okay.

PANEL MEMBER HAMMOND: I just looked at the LOAEL and I don't normally think we set a reference standard at, you know, half of the LOAEL or in this case a quarter of the LOAEL.

CHAIRPERSON ANASTASIO: Kathy, can you -- Kathy, this is Cort. Can you be a little clear where you're getting this 0.7? 0.7 ppm or is it the 0.7 ppb?

PANEL MEMBER HAMMOND: Isn't a 0.7 ppm is the REL for -- isn't that right?

DR. DARYN DODGE: Oh, no, it's in parts per billion.

PANEL MEMBER HAMMOND: Oh, I'm looking at the acute REL. Sorry. The acute REL is 0.7 ppm.

DR. DARYN DODGE: Oh, okay. Right. Right.

PANEL MEMBER HAMMOND: And this is the chronic. But --

DR. DARYN DODGE: Right. The acute REL -- proposed REL is 700 parts per billion and the -- well, the 8-hour chronic REL is 0.7 parts per billion. So it's a thousand fold less there.

PANEL MEMBER HAMMOND: Yeah. Yeah. Yes. Yes. It was the chronic -- the chronic first. I was misremembering. Sorry. Anyhow. Overall -- oh, I just want to say I was -- I was very pleased with the addition -- the really good literature review that was had. And thank you.

DR. DARYN DODGE: Thank you.

CHAIRPERSON ANASTASIO: All right. Thank you very much Kathy.

We'll turn now to Mike Kleinman.

PANEL MEMBER KLEINMAN: Thank you.

First, I want to reiterate what Kathy said. It's a very nice job and I thought that putting literature together the way you did was extremely good. It sends --

CHAIRPERSON ANASTASIO: Sorry, Mike. Can you talk into the mic.

PANEL MEMBER KLEINMAN: Let me take the mask off.

CHAIRPERSON ANASTASIO: Thank you.

PANEL MEMBER KLEINMAN: The -- I wanted to say that the way the tables were put together made it very easy to follow the logic of what was going on. I think a couple of minor things -- I have a bunch of minor typos and things, but I can send those separately.

But the -- I think the justification for using the developmental endpoint for the acute study, I think could use a little bit more shoring up in terms of explaining it. It was hard to get my head around the idea that they're doing a three-week exposure over the entire gestation period and, you know, saying that just -- you know, there might be one day that was the sensitive time point. You know, if there was a, you know, a little more justification for that, I think that would be helpful.

But I think, on the other hand, there is justification just looking at the widespread incidence of the biomarker. The n-propylcysteine in children, you know, in the NHANES study indicating that children are being exposed, you know, all the way through. So it's fair to take that as the target population. So I liked that.

I thought where you mentioned the inhalation unit risk factor - you know, up in the beginning, you mention it - it would be good to just put the number in. It wasn't referenced in the document. And I think just as a point of comparison for people to just see it, I think that would be helpful.

And the last thing I wanted to ask about is at the end of the document, you mentioned that CARB is anticipating identifying 1-BP as a toxic air contaminant. It is that part of this process or is that something CARB does separately?

DR. JOHN BUDROE: That's something that CARB does separately, but it's essentially automatic under the statute. I mean, they'll have to go through their regulatory procedure to do it. But they are required when U.S. EPA adds a chemical to the HAP list to designate it as a toxic contaminant.

PANEL MEMBER KLEINMAN: Right. I didn't understand that. That's good to know.

I think -- I have one more general note here. There were -- there is evidence of persistent effects in some of the high exposure studies. And did you factor that into looking at the chronic -- chronic effects or setting the chronic REL?

DR. DARYN DODGE: I believe it's incorporated into the chronic REL at the level of the intraspecies uncertainty factor. It's part of the reasoning for using it tenfold for both toxicokinetic and toxicodynamic portions.

PANEL MEMBER KLEINMAN: Okay. So there is a margin of safety for these.

DR. DARYN DODGE: Right. That's -- that's pretty much the maximum margin of safety. We -- that you can use for that part of the -- for that portion of the uncertainty factor.

DR. JOHN BUDROE: Okay. And there's also a degree of protection in the subchronic uncertainty factor of 10, which is less than 8 percent of lifetime. So there's a certain degree of -- that's meant to account for the uncertainty of what happens if you have a longer exposure than the 38.8 months that you're talking about in the key study.

PANEL MEMBER KLEINMAN: Great. Well, thank you. That's good. Thanks.

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

So we'll just go around now and see if other Panel members have comments. And Karen, since you're right to my left, we'll start with you.

PANEL MEMBER MESSER: Thank you. I appreciated the presentation very much. I thought it was very clear and -- and very comprehensive.

I only had one minor technical question really, which is on the slide of the graph that shows the algorithm by which the lower confidence limit is ascertained using the software on -- yes, on that -- that graph. So this is an illustration. I'm assuming this isn't actually the direct output of the program or -- or is it?

DR. DARYN DODGE: This is the direct output from the program, yes.

PANEL MEMBER MESSER: Okay. So that estimated probable -- probability is the model -- the model output from the program is what I would guess. Yeah. Okay. That was --

DR. DARYN DODGE: Yes.

PANEL MEMBER MESSER: That was my question. Thank you very much.

CHAIRPERSON ANASTASIO: All right. Great. Thank you, Karen.

Ahmad.

PANEL MEMBER BESARATINIA: Well, I echo other Panel members' comment, this is a really good piece of work. The authors have done a good job reviewing the literature, selecting pertinent papers, and summarizing them, and providing the brief synopsis. The text is really good and easy to follow and they have used very well established modeling approaches to make their derivation for REL.

The one concern that I have, although I understand all the limitations of the published literature, but my concern is regarding the choice of these two key studies that were used for REL of these two study. One is a non-published, non-peer reviewed study, which is sponsored by a consortium, and the other one, the Li et al. is a Chinese study, a foreign language study, which was basically translated into English for OEHHA. Both study, particularly the second one, has limitations. And you rightfully indicated them in the text towards the end. There are missing data. There are certain parameters that are vaguely described. Exposure assessment is not complete, and so on and so forth.

In academia, in the field that I work, these type of studies are rarely referenced in a report, or a publication, or a grant, let alone to be used for benchmarking purposes. I would assume for regulatory purposes, the standard should be much higher and stricter.

That is what I see going through this, but of course, I understand how your hands are tied, given the limitations of the availability of the published literature, but I just wanted to bring this up to see how the Panel or you feel about it.

DR. DARYN DODGE: Yeah. Those are valid points. We -- we decided to go with the Chinese study for the chronic REL, because it -- there was basically three studies that looked at the -- about the same group of people, quite a bit of information. But, you know, it does have its -- it does have its limitations. But we like to go with human studies, if at all possible, rather than to resort with two animal studies. That's why we have that table in the derivation section that looks at other alternative RELs based on animal studies. And they all fall -- the closest one was within threefold, but it was higher than the value we got based on the Chinese study.

So that's one -- that's one of the reasons we put those alternatives -- alternatives there. You know, in case we decide that the Chinese study was not strong enough, we can resort to these or at least we can point to these to show that we are being protective, because the Chinese study the resulting acute -- or chronic REL is lower than any of the other endpoints that were used in -- you know, that were from animal studies.

PANEL MEMBER BESARATINIA: Thank you.

CHAIRPERSON ANASTASIO: Thank you, Ahmad.

Joe, any comments?

PANEL MEMBER LANDOLPH: I agree with everything the other Panel members have said so far. The document is well and comprehensively researched from the literature. It's very well written. It's been reviewed extensively and they've answered the reviews. And it's interesting to see how, as far as dry cleaning is concerned, we started with PCE, we went to TCE, we went to TCA, and now we're at is 1-bromopropane.

And so I think you're absolutely right to be as health protective in this document as you can. And that seems to be what we want. So I congratulate you also.

CHAIRPERSON ANASTASIO: Great. Thank you, Joe.

Beate.

PANEL MEMBER RITZ: Yeah. I completely agree, well written. I enjoyed reading all the worker health studies. Thank you for putting those in. They were really well described as much as you could describe them.

And, I mean, I don't have much to add, except that I'm very surprised to see how much workers were harmed and then described as not employed anymore, but still having severe effects years later. So that -- that's very unnerving for somebody within worker protection.

The other thing that I was wondering was -- I mean, these peripheral nervous system effects are sometimes subtle, but sometimes not so subtle. And they are describing effects on the central nervous system, including depression and some cognitive outcomes. And that's what kept my interest, because those are more subtle. And when you are aging, you know, these effects can compound quickly. And then seeing that the U.S. population basically is exposed, 99 percent, that makes me wonder about long-term chronic effects even at low doses, so -- but, of course, there's nothing we have in terms of information about any of this. And these workers were all young, so I think you did the right thing going with the females here.

Thank you.

CHAIRPERSON ANASTASIO: Great. Thank you, Beate.

I'm looking over at Victor and Arash, now any connection from Paul? Has he joined us?

No. Okay. We won't -- we will skip Paul then.

I just had a few comments. One, line 1433 to 35, the sentence is just confusing. Whenever you read it, I'm sure you will be able to figure out what word might be missing. So that's 1433 through 35.

Second to kind of mirror what Mike was saying about including the IUR value, I think it's always helpful to have the EPA values. So if there are EPA values, it's nice to include those, so we can just compare what you've re -- what you've come up with versus what EPA came up.

I'd like to also reiterate the point that I thought the alternative REL derivation was very helpful to just see what the animal endpoints was giving us versus what you had for the human endpoint.

And then the -- my only other comment is in Table 2, which is the -- so like page 27. This is the acute/subacute effects -- actually, sorry. It's page 26. So you've got the Huntingdon Life Sciences Study here, which is the study you used for the REL, but this isn't the endpoint that you used for the acute REL, right?

DR. DARYN DODGE: Yeah, that's correct. These are effects that were seen acutely, I believe, in the -- in the mothers.

CHAIRPERSON ANASTASIO: Right. And this was skull ossification in the offspring.

DR. DARYN DODGE: Right.

CHAIRPERSON ANASTASIO: So are those in another table?

DR. DARYN DODGE: Yeah, the developmental effects were in a developmental table --

CHAIRPERSON ANASTASIO: Oh, okay.

DR. DARYN DODGE: -- later in the document. Yeah.

CHAIRPERSON ANASTASIO: It just might be helpful in the acute table, because that's where I was looking for, you know, going back and forth between the REL and the table to just make -- either repeat the skull ossification endpoint, LOAEL and NOAEL there, or just make a note in the table where that data is in the text.

DR. DARYN DODGE: Okay. I'll do that. Yeah.

CHAIRPERSON ANASTASIO: Yeah. And that was -- those were my only comments. Yeah, again, as every panel member has said, very nice job. So thank you, OEHHA.

And any final comments?

So we are running way ahead of time, which is a fantastic place to be. I appreciate that.

Dr. Krishnan, are you prepared?

DR. KANNAN KRISHNAN: Yes.

CHAIRPERSON ANASTASIO: Okay. Is there any reason we should wait?

DR. KANNAN KRISHNAN: No.

CHAIRPERSON ANASTASIO: Okay. Then thank you very much, John and Daryn. And let us push ahead with the first informational item

DR. ARASH MOHEGH: Before we push ahead, there is one Q&A comment but I believe we are not accepting public comments.

CHAIRPERSON ANASTASIO: Yeah. So just to clarify for the public, the -- by statute, the Scientific Review Panel does not take public input on health guidance values, so we will be following that procedure. Yeah.

DR. ARASH MOHEGH: Another point is that there was a scheduled 10-minute break here.

CHAIRPERSON ANASTASIO: There was, but we're way ahead time, so we're going to push forward and then we'll take our break probably after the next presentation. Yeah, but thank you, Arash.

Okay. So our next item is our first informational item regarding a proposed process for hot spots chemical reviews. And please welcome Dr. Kannan Krishnan who's Chair of the Air and Site Assessment Climate Indicators Branch at OEHHA, who will be making the presentation.

(Thereupon a slide presentation.)

CHAIRPERSON ANASTASIO: Dr. Krishnan.

DR. KANNAN KRISHNAN: Thank for the kind introduction.

And we with here today is Dr. John Budroe, Chief of Air Toxicology and Risk Assessment Section. And joining us online is Dr. Vince Cogliano, Deputy Director, Division of Scientific Programs at OEHHA.

This informational presentation is on proposed process for hot spots chemical reviews, specifically on leveraging authoritative sources to develop OEHHA documents. Now, let me invite Dr. Cogliano to make some introductory remarks before I continue.

Vince.

DR. VINCE COGLIANO: Thank you very much, Kannan and good morning, everybody. I'm really pleased to be bringing this informational item to the Panel today. In my career at different public health agencies, I've found the occasion to sometimes work on the same chemical at more than one place. And there's good reasons for that sometimes. You have newer studies since the previous assessment was done by somebody else or another assessment was of more limited scope, say perhaps only one exposure route, or your agency has particularly guidelines for how it conducts the evaluations of studies, or the public comments and peer review periods and you have to follow those procedures. So there are good reasons for multiple agencies doing reviews of the same chemical.

But sometimes, we're doing part -- some work that I wonder are we really adding value? For example, when we're adding -- when we're writing dozens and dozens of pages of descriptions of another study and another agency has done that really well. I sometimes wonder is this the best use of the taxpayers' money to have us redo the work of other agencies? And so you think about why can't we do this more like is done in the scientific community and build on the work of other peer-reviewed science and site work that's done that can be incorporated without compromising the integrity of our own product.

So we started thinking about this in OEHHA about how we might streamline the development of our assessments. And we're pleased today to bring you some of the ideas that we've had and to have a discussion with you about this.

So I'd like to turn it back to Dr. Kannan Krishnan who's the new chief of our Air and Site Assessment and Climate Indicators Branch. And you may know Dr. Krishnan's name from his many publications in the field, particularly in pharmacokinetics. And also, he comes to us from having a 25 or so year career at the University of Montreal as a professor and then working at one of Canada's largest public health agency for worker safety.

So with that, I'd like to -- it gives me great pleasure to introduce Kannan Krishnan again and turn the presentation over to him.

DR. KANNAN KRISHNAN: Thank you, Dr. Cogliano.

Can I have the next slide, please.

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DR. KANNAN KRISHNAN: So today's presentation essentially focuses on the first step of the continuum leading to the production of the document -- the final document on reference exposure levels, RELs, for non-cancer health effects, and cancer inhalation unit risk values, referred to as IURs.

So you see here the four boxes capturing the key steps, starting with the OEHHA internal consisting of a literature review, evaluation, and draft document development. Then public input by way of written comments and in workshops. Then SRP review and divisions leading to the final document.

The focus of this presentation and discussion is no the first box here right on the top.

Next slide, please.

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DR. KANNAN KRISHNAN: To develop hot spots assessments, OEHHA conducts comprehensive search and evaluation of the scientific literature in each case. And the OEHHA documents contain detailed study-by-study descriptions on the text on the development of dose response analysis to develop the health guidance values, as you have seen.

And the draft documents are submitted for public and SRP reviews at the rate of about one to three chemicals per year.

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DR. KANNAN KRISHNAN: In a draft document such as the one reviewed earlier today, typically we find descriptions of use and occurrence with a focus on California-specific data, full descriptions of toxicokinetics, key mechanistic data on health effects studies, as well as dose response analysis performed, preferably using inhalation exposure studies.

Despite the usefulness, the detailed study-by-study descriptions in some cases can be time consuming, can end up repeating the descriptions found elsewhere that is in other authoritative sources, and may not add value to the overall assessment.

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DR. KANNAN KRISHNAN: Considering the many chemicals without cancer and non-cancer health effects values and the need for such values. Now, in this context, we can refer to updates to Emissions Inventory Criteria and Guidelines Regulation chemical lists, and SNAPS, Study of Neighborhood Air Near Pollution Sources chemicals as examples. More rapid document development essentially can then support these efforts in a timely manner.

Thus, our internal thinking continues to focus on ways to expedite, ways to improve, and make it more efficient.

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DR. KANNAN KRISHNAN: In this regard, what we are proposing as an internal improvement is to leverage work from other health agencies and OEHHA programs when appropriate and feasible. Of course, when it's from outside OEHHA, we will review the scope and methods used in developing such a source document, I know, in view of our own goals and requirements.

And leveraging work from other sources would then call for streamlining the document contents. Basically, considering what's already covered in the source document used as a leverage and what additional data have become available since then, it would be appropriate to produce a high level synthesis rather than study-by-study descriptions, which can be found in the source document. So those are the situations essentially we're talking about.

Do the proposed approach would potentially improve efficiency to expedite the document development, especially for chemicals for which there is a possibility to leverage authoritative work done by other -- another agency or program, instead of redoing the literature research -- or literature review covering the same time period and presenting again or developing the study descriptions from scratch that has been done by another agency recently.

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DR. KANNAN KRISHNAN: And now there is an opportunity and a need at this time to apply such an expedited approach for ethylene oxide, designated a toxic air contaminant by CARB in 1987.

U.S. EPA has come up with a recent risk assessment based on human data that reports a cancer inhalation unit risk, or an IUR, value that's much greater than previously published based on animal data. And there are efforts underway to collect data and emissions from facilities handling ethylene oxide in the country. And our own assessment was done in '87. And in consultation with CARB, we're planning to update the IUR for ethylene oxide. So here is a situation that would really benefit from an expedited document development approach leveraging other authoritative work done on this chemical.

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DR. KANNAN KRISHNAN: So ethylene oxide is of interest to the Hot Spots Program as well as the Proposition 65 program at OEHHA. Ethylene oxide is to be reviewed by both programs for updating, since both of these programs developed estimates using animal data during 1987-88, in the late eighties.

Now, new relevant studies have become available since adoption of the Hot Spots and the Prop 65 values, including new human cancer studies. So here is the situation now with ethylene oxide in which you would be beneficial to coordinate efforts internally, so that joint development of the assessment can produce deliverables for both programs at OEHHA. And updating the ethylene oxide IUR can build upon the comprehensive and authoritative reviews available from other health agencies.

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DR. KANNAN KRISHNAN: So compared to the conventional workflow then, what we propose is to start out -- compared to the conventional workflow of starting with the full literature review, we propose to use the U.S. EPA 2016 assessment document as the base, not as the starting point, as the source for full description of studies published since 1987, that is since our last assessment -- since the last assessment conducted by DHS, Department of Health Services.

So OEHHA evaluation then will focus on literature search since the 2016 assessment or since the 2016 EPA document, and we would present an overall synthesis of the relevant studies and develop our independent dose response analysis, which will be described fully in the draft document.

So the proposed approach then would result in the use of the same studies on the same dose response models across the two OEHHA programs, and will benefit from concurrent public comment periods and reviews.

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DR. KANNAN KRISHNAN: So adopting such an approach, you know, in terms of leveraging other work, other authoritative work, would result in streamlining of the document content in a way, because we would present a synthesis of all relevant studies. Of course, the EPA document would be referenced as a source of all the older study -- of all the older studies and descriptions. And then we would include detailed descriptions of the key cancer studies as well as other relevant studies, and include full description of dose response modeling, including the study selection.

So the first bullet is where you see the modification or the -- the consequence of streamlining, if you will, that accommodates the synthesis of relevant studies using another authoritative document as the source for the older studies.

And the public input in the SRP review process components of the overall process will remain the same. So it's only the first box of the four boxes that I alluded to in slide two. That's where this modification would impact or occur.

So the next -- and the last slide.

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DR. KANNAN KRISHNAN: With that, we look forward to your feedback on expediting hot spot -- hot spots assessments by appropriately leveraging work of other authoritative entities and OEHHA programs, and specifically on the proposal to update the cancer inhalation unit risk for ethylene oxide.

Thank you for your attention.

CHAIRPERSON ANASTASIO: Great. Thank you very much, Dr. Krishnan.

So we open it up to the Panel for comments. All right. I'll start. Oh, wait. Ahmad, no you're very speedy on the hand.

Okay. So thinking about the background, if you remember, ARB came to us -- was it two years ago now, three years ago? I can't remember -- to update Appendix A of the Hot Spots Program. And they have added hundreds of new chemicals. And so there are -- I can't remember how many hundreds of chemicals are on the list now with no health guidance values. But clearly, at our pace of one to three documents a year, we're never going to get through them. So I am strongly in favor of any scientifically justifiable way in which we can expedite the process. It's a huge amount of work to develop these health guidance values. And so if we can leverage work that other agencies have done, that's a win for us, I believe. So that's my overall comment.

Dr. Krishnan, I was wondering if you have -- might have a sense of how common this approach might be. Are there lots of chemical species out there for which we've already got a health guidance value document from another agency?

DR. KANNAN KRISHNAN: I think for de novo assessments and for which there hasn't been a recent elsewhere or such work done, essentially that wouldn't change anything. We would have to do what we have been doing, and you would see exactly the same sort of documents.

In cases where we'd be able to, you know, use this as a starting point to see whether there has been a recent authoritative review completed we'd be able to, you know, take advantage of that and then -- and integrate it in the workflow. And I wouldn't have a number to put on the table. It would depend on the chemical and how recently other agencies have looked at it and conducted the literature review.

CHAIRPERSON ANASTASIO: Sure.

John, do you have any sense? Are there many documents out there that we could leverage?

DR. JOHN BUDROE: If you're talking about cancer documents, probably not a great deal. I mean, at least in terms of documents that have come forward with a cancer dose response assessment.

So, I mean, for example, IARC has a reasonable number of chemicals out there where they've done hazard identifications, but they don't do dose response.

So, you know, the question would be whether a future cancer document would be for the bulk of the study descriptions for, you know, cancer and genetox, for example, that also usually goes into a cancer document where it's just essentially instead of describing all the genetox studies where we would just say -- put essentially a summary of what's gone on and say for more detail see the IARC monograph. So that would be, you know, a potential avenue to go down.

But I think we went back when we originally did, for example, the cancer potency factor of TSD and mined way back when a lot of the U.S. EPA IRIS numbers that we didn't have -- where we didn't have a corresponding number. So we've already incorporated a lot of those.

And U.S. EPA doesn't come -- hasn't come up with a lot of documents recently. You know, ethylene oxide is one of the few that comes to mind. We've been kind of actually running ahead of them on some things, because we have cancer -- cancer inhalation unit risk now for cobalt, and PCBTF, and 1-bromopropane that they don't have yet.

CHAIRPERSON ANASTASIO: So that's for cancer endpoint. How about for non-cancer, do you feel -- is there much out there that we could leverage?

DR. JOHN BUDROE: We'd have to go back and look. I couldn't give you, you know, a one-to-one correlation right now. You know, we have a -- they've got their RfCs and they don't -- one thing I'll note is U.S. EPA does not do the equivalent of an acute REL. They only do the equivalent of chronic RELs, so -- and they have their methodology and we have ours.

So even when ours -- ours tends to be more -- quite frankly more health protective, so we could take one of their numbers potentially if they had a -- what they call a RfC, a reference concentration, and we don't have a corresponding chronic REL, but we would still have to make sure that there weren't any -- any studies -- newer studies that we needed to include, because a lot of the U.S. EPA IRIS RfCs at this point are pretty old. You know, so we would have to check the literature and we'd want to check their point of departure for their key study and go ahead and run it through our methodology to make sure it worked.

CHAIRPERSON ANASTASIO: Okay. Thank you. So, yeah, great approach.

DR. VINCE COGLIANO: If I might jump in for a minute. Since I've come to California, I'm actually pleased that OEHHA has been running ahead of the U.S. EPA in generating numbers. But I think one of the real values of this will be in the hazard area. So I think IARC has been pretty active in identifying new possible and probably carcinogens. And I think they do a very good write-up. And I think those could be leveraged on the cancer studies and on genotoxicity. And also ATSDR does quite a few very large documents on important chemicals. And I think again they -- the hazard part can be leveraged.

I think we would intend to do our own dose response analyses in most cases. So the fact that IARC doesn't do dose response, I don't think should hold us back, I do think that there's a lot of good writing they do on the cancer studies and genotoxicity studies that we could leverage.

CHAIRPERSON ANASTASIO: Thank you, Vince.

So I've just been handed a note. If someone has a comment -- and so we're not actually in public comment period yet, so public we're not ready for you, but if anybody else has a comment, please don't put it in the Q&A. We are not going to see the written comments at this point. So Panel members and anyone else, including Vince, please do what Vince did, which is speak up.

All right. So I'm going to go to Ahmad, and then Kathy, and then Beate.

Ahmad.

PANEL MEMBER BESARATINIA: Yeah. Thanks, Cort.

I great it's great what you're proposing here. And one of the goals that you are stating is to basically save the taxpayer money by avoiding duplicate work and doing the work that has already been done, which is a commendable task.

I'm wondering have you given any thought to publishing the reports -- the already existing reports or the reports that are going to come in the coming years, because these are tremendous body of works. Throughout years, I've seen these reports. They're very informative. They're of interest to a broad audience, including scientists, researchers, and authoritative bodies.

It is very likely that -- it is very likely that sometimes, the topics that you may want to consider working on has already been done by some other bodies, but the report is not in public domain, and that could happen to the work of your scientists here.

I know there are certain scientific journals that are interested in these type of reports. Although, these are -- the tend to be lengthy and -- but, for example, Lancet journals -- family of journals publishes these type of reports from IARC, or Mutation Research, or Elsevier publishers.

So I'm just thinking is it an option for you to look into and see whether or not you can make these available to a broader scientific community and other, you know, stakeholders.

DR. KANNAN KRISHNAN: I mean, I agree with your comment. And I -- and these are publicly available in the sense that these are being posted in our website. So certainly anyone doing like a gray literature review would -- would see it.

But regarding the publications, what I have seen, before coming to OEHHA, is that contents of several of the reports have appeared in the peer-reviewed literature, but I don't know about the specific program developing IURs and RELs, but I have seen parts of reports being published in the scientific peer-reviewed literature and -- and that that significantly contributes to the knowledge base.

So thanks for that comment. And I'll -- I don't know if anyone else wants to add to it?

DR. JOHN BUDROE: Just that, you know, one thing with IARC and the Lancet mon -- when they publish in Lancet is that I think they have a -- want to get their information out really early, you know, so they publish it in Lancet, you know, at least, you know, a summary of what they did and then they come out with the full monograph later.

Whereas, we have a -- essentially really have a process that we have to follow that's outlined in statute. So, you know, probably wouldn't want to hold up the document -- a document necessarily to publish it in the literature. It -- we could, I guess, think about doing that down the road. But, you know, we just try to get the health values out to the point where they're actually able to be used in the hot spots program as soon as possible.

CHAIRPERSON ANASTASIO: Thank you. I mean, Ahmad, I agree with the goal in terms of trying to make all this work OEHHA does and other agencies more available to everyone. But I feel like publishing is just another step that's going to take more time. And so I wonder if there's some way to somehow leverage indexing or somehow -- I don't -- I don't know how one makes studies more available, but I'm sensing from the hands that other people do. So I'm going to go to Karen and then Beate.

PANEL MEMBER MESSER: Yeah. I think it's a laudable point to make sure this literature is accessible, but I do agree that publication takes a lot of time. And that may not be in the direct Band-Aid of this process. So I wonder if a review article just alerting the scientific community to this resource might be a way to go, you know, an overview article in Lancet pointing out those resources available and directing interested parties to the website.

CHAIRPERSON ANASTASIO: Thank you.

Beate.

PANEL MEMBER RITZ: So hearing this, I was wondering why there isn't something similar to the comparative toxicogenomics database or Tox21 where all this data is actually available and very -- not just available, but, you know, you can use it in different ways. Researchers can use it and you can make comparisons across studies from human studies to the tox literature, which I, as an epidemiologist, normally wouldn't be able to, but I can, you know, put in certain genes. I can put in certain agents, and then the information is summarized for me.

And in this day and age, I think we should go towards, you know, that kind of standardization -- not standardization, but making available the literature and the work you're doing to the broader scientific community in that way.

So if you're generating this information, it could maybe be in a tabular form. And then with data visualization tools, that people can pull this data out and you never have to update it again. But you can of course start with IARC and you can start with ATSDR, you know, whoever has done work on that chemical, you can put all the different pieces of information online in a systematic manner. And that should be possible. And that would live a very long life and could be very cumulative.

CHAIRPERSON ANASTASIO: Thank you for that suggestion.

So I promised Kathy several minutes ago that I would call on her, so I'm going to do that. Kathy, go ahead.

PANEL MEMBER HAMMOND: Sure. Thank you.

First of all, I think this is a great idea at one level, because as you say there are just so many chemicals that need to be done, and having them redone, and redone, and redoing work has limited value.

However, I do want to talk about where it does have value. As we said earlier, most agencies are not using extensive global literature. And I was very pleased to see the extensive access and use of the Chinese literature in this most latest document.

So I would encourage that as we -- you go further and build upon the things that are there, and rely on them, that you not only look at the literature that's been published since the -- other material was done, but also the literature that was omitted. But I think that that's an important step.

And again, as has been mentioned, IARC does not do a dose response, so that's an important step that would also need to be done. So I think there still will be plenty of work to do, but let's minimize the duplication of the work for sure, so we can get more chemicals done.

So thank you for the ideas.

CHAIRPERSON ANASTASIO: Thank you, Kathy.

Mike, did you have a comment?

PANEL MEMBER KLEINMAN: Well, I was going to say pretty much what Kathy said, but I do have another point, and that is as you look at these compilations and pick the -- you know, what they've chosen as the key references and points of depart -- departure, I think you still need to kind of do your due diligence and actually look at the primary literature to make sure that the way they interpret it is the way you would want to interpret it.

CHAIRPERSON ANASTASIO: Go ahead, Karen.

Thank you, Mike.

PANEL MEMBER MESSER: My comments I think will echo these -- these last two comments. I think it's an excellent idea, similar the way we all use Cochrane Reviews when we do a literature search, but that there are some caveats. And I -- the quality of the work is so high here that I'm sure the natural tendency will be to do the due diligence, but just to explicitly identify some of the potential weaknesses in such an approach. There's a question of how authoritative will be defined. In other words, I think there needs to be some objective standard when you say this is an authoritative reference work that we're going to rely on. The need to be some standards for that, so that there's no potential for eventual abuse, if a less diligent team were in charge.

And I agree with the comment of my colleague that the synthesis still needs to describe relevant details, because the devil is in the details with these studies, especially that the key studies need to be read and described de novo. So I would think such a synthesis would help to identify the key studies that are being used, but that those key studies should be read from the original source and still be described and also that any details which may be lacking could be added. So you might be referencing an authoritative document, but if there were particular details needed for your process, you'd still be at liberty to add them. So those -- those would be the potential weaknesses that I would think should be addressed in whatever workflow is set up. It's a wonderful idea.

And then, Cort, getting back to your reference of the hundreds of new chemicals, I know at that time we had described -- we had discussed some sort of algorithm for prioritizing them. And I just, as a separate point, wanted to ask at some future time if there would be a discussion of that issue.

CHAIRPERSON ANASTASIO: Yeah. Good point. My understanding is that's not an SRP task, but that's more an OEHHA task. Is that -- can you confirm or deny that, John?

DR. JOHN BUDROE: That would be essentially correct. I mean, if we could do -- we're doing tens or hundreds of chemicals a year, then you might want to have a prioritization scheme, but for the limited number that we have the resources to actually put out, usually all the slots in the pipeline get filled up between consultation with CARB, or the air districts, or just seeing data sets pop up out of say NTP.

You know, a brand new cancer data set, and lo and behold, here's a VOC that's a carcinogen that we didn't realize before it was a carcinogen. So those are the kind of things that we put in there. And we also look where the information is available for things like how much of that chemical is used around the state, how many, so -- I mean, you could wind up -- otherwise, you can wind up with a chemical where you decide to work on it and it's a carcinogen, but it's used by one facility in the state. It's where do you want to put your resources.

CHAIRPERSON ANASTASIO: Right. Yeah. I would say in regards to Karen's point, that the panel is available if you want to consult with us about prioritization and kind of big picture questions of prioritization.

DR. JOHN BUDROE: Okay. We would appreciate that.

CHAIRPERSON ANASTASIO: I think the other item I would add is that I know John Faust gave us a presentation some time ago about provisional health guidance values. And I think that -- that offers the opportunity to try to get through chemicals more quickly at least on a provisional basis. And I don't know the status of that, but I'd be very interested to hear at some point maybe John Faust or someone else from OEHHA giving us an update on where that stands.

DR. JOHN BUDROE: Okay.

DR. VINCE COGLIANO: I don't know if John can speak right now, but I can say that we are -- we have developed some provisional values in our -- for our SNAPS Program. And we expect to be doing more, particularly as we look at leveraging some of the new methods and read across from structurally similar chemicals that we're finding at these sites near petroleum sources. So at some point, it would be good to come back and talk to you about what we're -- what we're doing and what we're intending to do in that area.

CHAIRPERSON ANASTASIO: Yeah, I think the provisional health guidance values also offer an opportunity for prioritization, right? You look at the list. You see what you have for provisional values and those that appear to be very toxic and that are used a lot in the state, that would be obviously a key target for a high priority full health guidance value.

DR. VINCE COGLIANO: That's right. I think there's certainly the potential to find chemicals that are present at these sources, and that we don't have health guidance values for, and we might even need to look at a structural analogue or try to use new methods to develop tox values.

But it would -- it would give us some chemicals -- a list of chemicals that there's a need for tox values for, because people are being exposed.

CHAIRPERSON ANASTASIO: Thank you, Vince. Thank you, John.

Any other -- yes, Joe, go ahead and then Beate.

PANEL MEMBER LANDOLPH: I agree with pretty much everything that was said already. I certainly agree that you should use any scientific resource that's credible, you know, that's out there, assuming you trust, you know, the people that did it and the credibility of the science.

And if you were put in a position of ignoring something from an authoritative body because you think it's wrong, or politics has corrupted it, or something like that, then I think you should just state that we find this to be not the best -- very best document and we're going to depart from it at a certain position, because of the following reasons, just state why, and go ahead and make your own document.

Some situations you'll get, such as I can cite the EPA with, you know, dealing with the ingestion of hexavalent chromium. I mean, they fooled around with that one for a long time. The document was just stuck and other documents it then reviewed, and rereviewed, and rereviewed. So if you think, you know, you should go ahead, and if it's important enough public reason to do so, just go ahead and do it and say why you're going to do it, and don't -- don't hesitate to -- to go past them. I think that's fine.

The other question is one of triage. And I think that's -- you're going to have that forever. But on my suggestion, there would be -- maybe you could lineup some temporary IUR values or whatever you have from the literature, multiply them by the number of people you think are exposed in California and get a crude calculation of what you think the total number of cancer cases might result from exposure of that chemical and triage those to the top.

And then you'd have the factor of both the exposure and the IUR giving you a crude estimate of what you think the cancer is coming down the line might be. And that would probably let put some of up -- way up to the top and some don't waste your time on, because you'll never get to them.

CHAIRPERSON ANASTASIO: Thank you, Joe.

Beate.

PANEL MEMBER RITZ: I also find it very interesting this tension between having a lot of data and having very little data. And you having to make the decision, which study to put forward for your, for your assessments and then maybe ending up with one key study. And that may seem to some outsiders as very qualitative, and, you know, what are the criteria, and you explain them to us and that's totally fine. But when you're starting with a document that's already summarizing the literature, you may not be able to make that discernment of what is really the best study here to use, if you cannot summarize the literature in some kind of meta-analytic away.

And then if there is a lot of data with a lot of meta-analytic approaches taken, I'm -- I'm very familiar with, you know, we have like one meta-analysis a month coming out in certain topics right now. And I kind of disagree with everyone when I read them, because I would just take other values from the original literature, so there's a lot I think that we don't know, so we have to be kind of careful in just adopting.

So somebody needs to read the original literature, I think, and come up with criteria of which of the pieces of original literature should have gone into this meta-analysis or should gone into -- or should have been pulled out as the key study.

And I think that's a process we cannot necessarily automate. But I do agree we have to -- we have to, you know, encourage this being much faster than it is right now. We basically need 10 panels like this to make headway, but yeah.

CHAIRPERSON ANASTASIO: Thank you.

DR. KANNAN KRISHNAN: If I may add a couple of comments based on what I heard about the -- about leveraging work from other sources and agencies.

One is that I agree with the idea that there needs to be an evaluation step. I think I indicated that in slide 6. So it's not a -- it's not blindly relying on one, but rather having an evaluation of a document for -- before we use it for our purposes and requirements. So that is well taken. There are various criteria that one can think of in doing that. That's one.

The other thing is this in a lot of the cases here, we're talking about actually making use of the literature research and the literature review that's been done by another agency, and that we consider useful. I think that's where it makes a difference. It's not -- it's not always thinking about adapting a value, but, you, know leveraging the lit search and the descriptions that have been developed.

If you remember the document you reviewed today, every study is described. Those were study-by-study descriptions. If that has already been done, and I don't see any judgment in there, because each study is described in a factual manner in all the treatment groups, and the doses, and the observations, and so forth. And it would be of value to be able to make use of it, and then, you know, if we have something to lean on, and then build on it. I mean, that's the proposal for ethylene oxide essentially. So I just thought I would clarify that.

So it's not automatically adopting the entire, but, you know -- so I just wanted to clarify.

PANEL MEMBER RITZ: Can I just intersect one thing. Yes, you're absolutely correct, if it's just, you know, this is the literature that's out there without value judgments, that's totally fine. I just see in epidemiology, and that's where my expertise is, that oftentimes certain case control studies are excluded, because, oh, that's a case control study, and I would totally disagree with the value judgment that's put on certain studies.

DR. KANNAN KRISHNAN: Yeah, that's why we would look at the method used buy the -- you know, in the source document, and essentially there's an exercise of scope and problem formulation in it -- in our documents. You know, that would really situate where we stand and how we use the source document.

Thank you.

CHAIRPERSON ANASTASIO: Yes, Karen.

PANEL MEMBER MESSER: Yeah, I appreciate this thoughtful discussion and the suggestion. Is it appropriate for me -- I really appreciated the detail that Dr. Dodge and the diligence that he put into the current document. Would it be appropriate to ask Dr. Dodge for his comments on how useful this might be, or benefits, or cautions from that perspective?

DR. DARYN DODGE: Yeah. I think it would be very useful, especially in the case of ethylene oxide as Kannan pointed out. We've got a great background of literature, and summaries, and reviews that U.S. EPA -- U.S. EPA did, you know, up to 2016. So I -- if I had -- if I was going to be doing ethylene oxide - I might pulled in at some point to help out, but I won't be the lead on that - I would really want to concentrate on everything that's been going on, all the published literature since 2016.

Ethylene oxide, there's a lot of information out there, you know, even compared to 1-bromopropane to review, even since 2016, I believe. So, yeah, I -- I agree with this process.

PANEL MEMBER MESSER: Okay. Thank you. I think that's very helpful to hear from the people who are doing the work. Thank you.

DR. VINCE COGLIANO: Yeah. If I could also elaborate on that. I think that the tables and the quantitative data that you found helpful in Dr. Dodge's presentation, would be present in any dose response analysis we do. So the key studies that are used for dose response assessment, we would have very detailed information in the document, also why we picked those studies. So you will see that.

What you -- what we're proposing not to do is to take -- you know, have those paragraph-by-paragraph study descriptions of the studies that did not prove to be critical. And so that should hopefully make a shorter document and one that focuses really on the critical information. But when dose response analysis, we do intend to do our own Dose response analysis, and you can -- all th details about the method we used, the studies we chose, and the calculations.

CHAIRPERSON ANASTASIO: Thank you, Vince. Joe, one last comment.

PANEL MEMBER LANDOLPH: Yeah. Sorry. Yeah. Geez, it seems to me a lot of these chemicals must be of concern to the EU. And, you know, there should be some effort at a higher level to get more people more countries involved that are in synch with us in terms of thinking of protection of the public health, because it just seems ridiculous that all these separate values keep being generated. And it's a huge amount of work. You know, I can see just from looking at the document you guys put together already. So maybe through your agency leads, maybe you could discuss whether there's a possibility to ally with other scientific agencies and other countries on a select group of say high priority really toxic chemicals that all these countries deal with.

CHAIRPERSON ANASTASIO: I imagine every agency has their own procedure in terms of how one develops the health guidance value. But it may -- at least maybe that would work for the literature review component of it, if you could somehow divvy that up.

DR. JOHN BUDROE: To a point, I've tried to us REACH for example, to get information on chemicals and I've been vastly disappointed.

CHAIRPERSON ANASTASIO: Okay. Yeah.

DR. VINCE COGLIANO: Well, I think this is something that we will continue to discuss. And I would think that 10 or 20 years out there might be more cooperation between agencies, but there are still differences in procedures. So like we have the statute here about having our documents reviewed by the SRP and having two public workshops in California before the adoption of these numbers.

So there has to be some way of taking something common and still tailoring it to the specific statutes and mandates that different agencies have, but I think there is a core of science, like what is the literature base, what's the literature search, what's a factual rendition of the studies that perhaps we could all share more than we -- we've been able to do in the past.

There's also scientific efforts that go on, like at the World Health Organization, the toxicity equivalency factors for dioxin. It was an international effort that had a lot of people from government agencies and academic institutions survey the literature and make expert judgments that have stood the test of time and have been able to be adopted by many agencies.

So perhaps in some very contentious issues, there will be efforts -- more efforts like that as well.

CHAIRPERSON ANASTASIO: Great. Thank you, Vince.

So with that, I'd like to wrap up the discussion of this. Thank you, Dr. Krishnan. I -- you know, as we could hear from the Panel, we were all in favor of methods that can expedite the process, while still bring all the scientific rigor that we know OEHHA brings to bear on these documents. So thank you for that and we look forward to hearing about ethylene oxide.

So we are doing very well on time. And so what I would like to do, but I want to clear it with Minh first is we're going to have a DPR presentation. It was planned for after lunch, but I'd like to move it up. We're going to take a 10 minute break. And I'm hoping that Minh will be able to speak with us, give us his presentation in 10 minutes. And I'm going to clear that with Norm and make sure everybody is on board, but that will be the plan. Please reassemble in 10 minutes. Hopefully to hear the DPR presentation on 1,3-D. Thank you very much, everyone.

(Off record: 11:28 a.m.)

(Thereupon a recess was taken.)

(On record: 11:40 a.m.)

CHAIRPERSON ANASTASIO: All right. Good morning, everyone. We're back. Our next item is our second informational item. It's an update from the Department of Pesticide Regulation on 1,3-dichloropropene, also called 1,3-D, an emissions monitoring study that DPR did in the AB 617 community of Shafter.

We're going to first have a presentation from Dr. Minh Pham, who's the Branch Chief of Environmental Monitoring Branch, Pesticide Programs, Division of CDPR, and then we're going to have Panel discussion, and then we will have public comments. We will allow public comments. So I'll talk about the process for public comments at the end of the Panel discussion. So if there are members of the public who would like to comment on this, you will have a chance after we've done the first two components.

So with that, I'd like to give a warm SRP welcome to Dr. Minh Pham.

(Thereupon a slide presentation.)

CHAIRPERSON ANASTASIO: That's how warm our welcomes get, Minh, so --

(Applause.)

DR. MINH PHAM: That was -- that was -- that was very warm. Thank you.

(Applause.)

CHAIRPERSON ANASTASIO: There we go. All right.

DR. MINH PHAM: Thank you. Thank you.

I don't know what I did to deserve that, Cort, but thank you so much.

So again, my name is Minh Pham. I'm with the Department of Pesticide Regulations here today to speak about 1,3-dichloropropene, specifically with the mitigation pilot. We've been in collaboration with Kern Country and specifically the community of Shafter. So I'd like to go through that with you here today.

If I can get the next slide, please.

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DR. MINH PHAM: So just a quick agenda. I'm going to touch bases with the background, kind of how the pilot project developed in our collaboration with the County and with the community itself; update on the actual mitigation pilot, which we wrapped up earlier this year; preliminary results and some comparisons; and also, some key next steps for us as a Department.

Next step please -- next slide, please. Sorry.

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DR. MINH PHAM: So just as a quick background, 1,3-dichloropropene, which I'll be calling 1,3-D throughout this -- and if I do a bunch of acronyms and you're lost, just let me know.

So this is a preplant fumigant, used to control nematodes, insects, and various other diseases in soil. It's major uses in California include fruit and nut trees, strawberries, grapes, and carrots, specifically for this area. We're looking at the fruit trees based on the -- and I'll get into a little bit more of the work, but we're looking at the fruit trees and nut trees in the area.

It's currently registered and managed as a restricted material, so it does have some extra key requirements that it needs to go through prior to its use.

Specifically, for the -- for the community of Shafter and the AB 617 group that we've been working on -- working with, I'm sorry, there was some concerns and interest in 1,3-D emissions and how we go -- can go about reducing that. So the key question that I went back to my team with is how can we achieve this. I know we talked before about TIF tarping, the plastic tarp -- the Total Impermeable Film tarping that we typically see. That is a good standard for effective emissions reductions, but we know there issues with that. I mean, tarping is expensive. Is it practical in certain regions? There's an element of disposal that comes along with it that we need to deal with.

So we went back to the drawing board and took a look at what we've done in the past for various other chemicals and looked at potential pathways that we can mitigate this in a different way.

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DR. MINH PHAM: So again the background, the goals of the pilot. Again, we were trying to develop a feasible mitigation option and really study 1,3-D emissions and its cape -- it's capabilities for these new mitigation options that we're putting in there. So we wanted to not only maintain grower flexibility and applicator flexibility, but again, there's a lot of feasibility and California's regional specific needs that we wanted to incorporate into our study.

And ultimately, we wanted this study to -- the result of this study to effectively go into our ongoing work by bystander exposures for 1,3-D and the rulemaking process that we have set up for that as well.

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DR. MINH PHAM: The partnership with Shafter, we've -- we're not stranger to Shafter. We've been there for the air monitoring network since 2017, but we've actually been there since 2011 doing various other studies. So we've been in the community working with local schools and the county through all those years.

In this specific project, we were able to collaborate with CARB and the AB 617 steering community. And then, you know, providing them technical support for their concerns and hearing what they wanted to come out of this -- this collaboration. Obviously, we're there in partnership with Kern County agricultural commissioners, and, you know, this was again an opportunity for us to interact directly with the locals specifically with the -- how the AB 617 structure is set up.

But furthermore, I think it was a good opportunity. The region of Shafter allowed us to leverage some unique geological and weather, you know, interest that we had when we were doing this study. And I'll kind of go into it more, but there's a rhyme and a reason to when we selected the pilot studies for the area and also what methods we -- we were also selecting for the -- for the region.

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DR. MINH PHAM: So as I mentioned, the mitigation pilot project did complete at the beginning of this year. We ran through about a year and a half doing the study. We were able to get five field studies completed. In comparison, we typically only do one field study a year. So this was a huge endeavor by DPR's team, and, you know, a lot of cooperation across the board.

We were able to do this in Kern County, Merced County, Stanislaus County, and Sutter County. And here, speaking about the field studies, these are some of the mitigation measures that we were looking at. So obviously, we know that we wanted to get comparable emissions reductions to that, which TIF tarping gets, but we also wanted to validate our computer modeling in this -- in this whole endeavor and also build out the library that we have for our soil data, our weather data, and a couple other things that are used for modeling inputs.

We looked at higher soil moisture. I think that was one of the key factors that we noticed that would help the suppression of emissions. We also looked at soil compaction, which is a practice done with other fumigants.

Deeper injection. This is one of the things that we were really curious about because this allows us to essentially put the inject -- put the fumigant down deeper into the ground allowing both the soil and the soil moisture from the top to serve as a -- as a pseudo tarp, if you will.

And then some of the other things that we just kind of ballparked around was this idea of a 50/50 tarping or a -- you know, like strategic tarping for the edges or some combination of all these things. So the team was kind of being open-minded about what we can and can't do. But then when we went out to talk to the county agricultural commissioners, to the applicators, to the counties, we kind of had to incorporate what is actually likely to be used on the field. So one of the things that I typically tell everybody is my team does a great job behind the computer screen, but when we go out there we have to make sure that it's -- it's feasible in real life. So a lot of cooperation and a lot of coordination happened there.

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DR. MINH PHAM: So just a quick idea of the setup here. So, typically that inside field is what we're monitoring, so we would have an application applied there. We typically set up this -- this arrangement is about 12 monitoring stations. Those are the blue dots there. On the edge of the field, we typically go about 40 feet edge -- at the corners about 80 feet. And then we also have an on-site weather station that will monitor whether at I believe three different locations.

The pumps that we use -- I'm sorry, the equipment we use here are essentially pumps. And we have to use sorbent tubes to collect the data. And this -- there's no automation of this, so my team was out there 24 hours a day making sure things were working and changing out samples and make suring[SIC] that the quality of that was all good to go.

Some of the key things that we considered here, I know that typically these fields are set up between one and five acres for a monitoring study. This is what we believe to be the most conservative monitoring setup. I know there was some interest in monitoring for a larger plot, let's say like a 20-acre plot, but we -- we know that with limitations in air monitoring resources, like the equipment itself, having -- you know, having four to five times more equipment was not -- was not an option for us. And we also know that this -- this practice of doing between one and five acres is scalable. So we actually think that by scaling it up and down, we actually get a more conservative estimate on the emissions leaving the field as opposed to doing a monitoring study using a larger field, because in the past, statistically speaking we've noticed that it was not as -- we weren't able to scale it as well using a larger field in the past.

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DR. MINH PHAM: So some additional just nuances, 12 monitoring equipment that I mentioned here. Each one of these studies was roughly about 300, 300 plus air samples collected over the duration. So the first four days every six hours that we were out there. We actually start the day before doing a background. So we'll -- we'll be the -- we'll be out there. At the time of the application, we will actually set up right before the application and take down right after the application, so we'll actually get monitoring results at the time of the application as well as times thereafter.

So as I mentioned, first four days every six hours around the clock. It makes for a very fun time at two, three in the morning when you're struggling to see any kind of light out there in the field. And then thereafter, we switched to a 12 after -- 12 hour sampling duration for days five through nine. That's from our understanding of the behavior of the fumigant and how it disperses off of the soil.

Yes.

PANEL MEMBER MESSER: Just a clarifying question, time zero is the time of application?

DR. MINH PHAM: Time zero is actually the day before. So -- actually, no, you're right. Time zero -- time zero is at the time of application and then we have between 11 and 24 hours before, and then nine days after.

PANEL MEMBER MESSER: Thank you.

DR. MINH PHAM: Some of the key elements that we also were table to take advantage of is collection of field characterization. So we did field samples for all of our studies. We also had field moisture, which was a big element for us as well. So WE developed a field capacity experiment that we would so, we would know the field capacity, and as I mentioned before the real-time weather data.

So all that feeds into both HYDRUS and AERMOD just to touch on that. That's kind of what we're trying to build out to. I think I can sit here and talk about how monitoring is difficult and it's kind of nuanced in the sense that it's only for specific scenarios. We wanted to build out all these inputs so that we can build a -- an emissions or a flux model, using HYDRUS, which is the industry standard for solute transport, and then from there use that as a basis for air dispersion modeling, which we use AERMOD for. And there's some key elements that we incorporated in from the rest of the Department, such as health thresholds and all that -- all that good stuff too. Find mitigation -- I'm sorry, find acceptable distances in how the fumigant moves and at what concentration we see it at different durations of time.

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DR. MINH PHAM: So this is a -- just a quick list of everything that we've done for the study, but I've highlighted Study 4 and Study 6 there, which are specific to Shafter. Just to touch on this, the first three studies were actually performed by UC Davis and the registrant. So we were a part of that only as kind of helping them with weather and soil. They had their team do sample analysis and a separate laboratory analysis. We will -- we plan to take a look at their study and kind of use it in collection with a lot of the other stuff that we do, but we have yet to kind of go through the quality analysis of that.

So as you can see there, the two highlighted for Shafter and then the other three studies for the other counties, along with the different mitigation options that we had done there.

One of the reasons I -- I put this in here, so the first study for Shafter was performed in November, so in the fall of 2020. And that we did an 18-inch injection with higher moisture. We think this would be a typical practice that would -- the county would transition into, because around this time you would anticipate natural rain. So it would be an easy move for the county and the most practical way to do it.

And then we did the 24-inch deeper injection with a compaction level and that occurred in Shafter in May. So that's more of a spring/summer application and we believe that that's probably the most feasible, because it's dif -- some -- in some areas, it's difficult to get water. And I think this deeper injection with the compaction -- will take in the compaction. Now, the deeper injection is probably the most likely pathway that we see for the growers.

And some key elements. Obviously, Shafter is within the Kern -- within Kern County, which has a -- which we've identified as a high-use area for 1,3-dichloropropene. So I think within the state, it's about 14 percent of all State usage. So when you break that down, I believe within the Shafter community, boundaries we're also looking at about 13 percent of all of Kern County. So I think this is a good representation of, you know, a high-use area that we knew we were going to get something. And we were really trying to leverage that along with all the geological and weather conditions that we had there.

Next slide, please.

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DR. MINH PHAM: A quick representation here. There's -- for the selection, we kind of lucked out on this, but I'd like to just take credit anyways. But the 24-inch injection, that's -- that was done within the boundary of the -- of the AB 617 community of Shafter, and then the 18-inch was done on the outside. We think that -- we assumed that this would probably most likely by the case as the 24-inch injection would actually allow for less emissions, so we think it actually would be more beneficial closer to the community area, whereas the

18-inch you can have it further out. So whether it be lucky or not, we were able to get it in the right places.

So next slide.

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DR. MINH PHAM: So digging deep into our -- our analysis here, I want to -- I apologize for this graph. So calling to this graph, we actually wanted to take in -- take into comparison a couple of historical studies. So the blue on the background there, that's our Knuteson study, which is a historical just plain 18-inch injection that's typically done. So we used that as almost like an upper bound for emissions. And then we took a look at our Lost Hills study, which incorporated TIF tarping. So we kind of looked at that as our lower bound.

So if you look at there, Shafter is the red line. So we are hitting essentially in the middle, which what we were anticipating when we were initially modeling out the work done here, so the monitoring data was able to recognize that.

So next slide, please.

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DR. MINH PHAM: A couple of numbers here for the bar graph. So our results were very promising. So in comparison just really quickly here, the black line here is that 18-inch injection historical and the blue line is the TIF tarp historical, and the red is the Shafter. That's our current study.

So, in general, we were hitting very -- very promising numbers. So for the peak 24 hours, you're talking about 32 percent reduction for -- in comparison to the typical 18-inch. The 24 and the 72 hour rolling average, we were, you know, above 55 percent for both of those reductions. And, you know, we -- in comparison to the TIF, we wanted to get comparable to that and I think we hit that. We were within about 15 percent overall for that one.

Next slide.

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DR. MINH PHAM: So the second study that we did, that 24-inch injection with the compaction here, same set up, we used the two historical studies as bookends to kind of see where we're at and kind of compare our method here. Very similar results actually. We got very, very close to the Lost Hills TIF tarping study. So, very, very excited about what that means. Going to dig in -- our team is digging into some more of the numbers and nuances of that to do some more verification. But again, this is very promising overall in the -- in the scheme of a new method that would be essentially an alternative for the growers.

Next slide.

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DR. MINH PHAM: Digging more into the numbers here, you're looking at upwards of 65 plus percent overall are reductions from the -- from the traditional 18-inch. And we're actually falling below the TIF -- the TIF peaks. So again, we're digging more into validating that -- those numbers. But if this holds to be true, then we think that we have a very good method for An alternative here.

Next slide.

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DR. MINH PHAM: So really briefly, I just wanted to show across the Board what we're looking at for the other studies. I think on the left -- sorry, on the left-hand side there, you'll see the two historical studies. So the first one is that 18-inch I mentioned it and then the second is the TIF tarp historical.

So in comparison to all the studies that we did, we are exactly where we thought that we were going to model out to, so -- I'm sorry, monitor out to. So we're -- we're well below traditional 18-inch injection and we're floating in and around TIF tarping. So the -- getting the comparable emissions reductions that a TIF tarping would give you without the addition -- the addition of the plastic is very promising for us. And that's, you know, what the team strived to set out to do.

And we're hopeful that the data followed through with what we were thinking there.

And these are -- just to really quickly touch on the different methods. It's not just going to be just for the Shafter region, but I think statewide this offers essentially a menu of different options that a grower can use to meet their -- either setback distances or emissions reductions. And I think overall, we anticipate a shift in the market towards these anyways. So we'll -- I'll touch on that as we get into the next few slides here.

Next slide.

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DR. MINH PHAM: So next steps. Obviously, the team is trying to build out, like I mentioned, a robust library. So we have these fluxes. We have added additional soil libraries and weather information. All that will be fed into our modeling for fluxes across the state, different scenarios, different inputs that we can use.

Excuse me.

So, with that, we anticipate refining those computer modelings to be as close as possible to what we're seeing from a monitoring standpoint. I think in the last iteration that I talked to the team, we were actually -- for most of our modeling, we were actually pretty close. So I have the number somewhere. I'll get that really quickly.

But I think initial -- initial work showed that we were within like two -- two times the mean I believe. So I'll have to double check that. But overall, our modeling looks impressive.

What all -- does all this mean? Well, in -- as I mentioned before, we're going to include our monitoring and modeling work in the future rulemaking efforts. That, along with toxicology from our Human Health Assessment Branch and a couple of other groups within the Department, we're looking to put out a rulemaking that will address acute and cancer risk for 1,3 for the state. We're on track to do quarter four, so at the end of this year to start that notice.

Add I think that should wrap me up.

Next slide is just my contact information --

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DR. MINH PHAM: -- should you have any additional questions for me, but I can also field them now.

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

Questions from the Panel?

PANEL MEMBER KLEINMAN: How do these count or compare with respect to the cost of TIF tarping?

DR. MINH PHAM: So it's significantly less. TIF tarping I think the last estimate we got was I think a thousand per acre to lay down the TIF itself. So you're talking about not only the raw material but the additional tractor that it would need to pull. So there's some cost for diesel and all that stuff for the -- for the additional tractor.

With this, from what we talked to the applicators for, it's significantly less. It's a little bit more than the -- than what is being cost of the 18-inch, but it's not significant from what we're told.

PANEL MEMBER KLEINMAN: And so the costs of the water treatment versus compaction they're about comparable?

DR. MINH PHAM: Yeah, so the -- the water treatment from what we saw was very much comparable to everything. There are a few other fumigants that also require water treatment. And in some aspects they're actually combined with the 1,3-D. So we actually saw that some applications actually used that water. A lot of the growers we talked to use water naturally -- like just from rainfall, so they kind of time it to the weather. So we -- in talking about it, we don't anticipate a large increase, but we are also talking with our economics analysis team to really flesh all that out when we do our rulemaking. Unfortunately, I don't have the key numbers. But from what I -- what I was told, it's very comparable.

PANEL MEMBER KLEINMAN: It looks like a real win.

DR. MINH PHAM: We're trying.

PANEL MEMBER RITZ: Maybe you can just explain to me where does the dichloropropene that does not go into the air now remain? Is it in the soil, so the soil has more in the end?

DR. MINH PHAM: So it -- from my understanding, it breaks down. So it -- from the modeling that we see, it's pretty much out in about two weeks, but there -- I don't have the half-life in front of me, but it does disperse. And there is some breakdown in the soil, but it essentially -- it does disperse in the air.

PANEL MEMBER RITZ: So basically you're saying, it doesn't disperse as peaks anymore, but over time it does disperse, everything that's in there.

DR. MINH PHAM: Not everything. So the longer we're able to trap it in the ground, the more it actually breaks down within the ground.

PANEL MEMBER RITZ: Okay.

DR. MINH PHAM: So that's -- that's our --

PANEL MEMBER RITZ: That's the benefit.

DR. MINH PHAM: Yeah. Yeah. And we're doing some long-term modeling to take a look to -- at that as well. Monitoring studies are usually the acute time frame. But we are -- as I mentioned, the rulemaking does have some work done with the chronic and cancer risk as well, so the team is looking into that as well.

CHAIRPERSON ANASTASIO: Karen.

PANEL MEMBER MESSER: Yeah. Thank you for these very interesting data and congratulation on -- on some amazing field studies going out there.

Could -- could we just see your -- the line graphs again. I was a little bit --

DR. MINH PHAM: Sure. I don't have control of the --

PANEL MEMBER MESSER: Oh. Can we go back to those line graphs? I'm just interested in the peak.

DR. MINH PHAM: The peak there.

DR. ARASH MOHEGH: Which slide would that be?

PANEL MEMBER MESSER: I don't have the slides.

DR. MINH PHAM: It's like slide 11, I think -- or slide 10 or 11.

It should be the first one.

And I'm sure you're interested in that -- that initial peak around the 60.

PANEL MEMBER MESSER: Yes. There we are.

DR. MINH PHAM: Yeah.

PANEL MEMBER MESSER: Yeah. It seems pretty spiky, right?

DR. MINH PHAM: Yeah. So the team looked into that. So I have notes here. So we took a look at that 60-hour -- the peak at 60 hours. And it equates to about 18 ppb, which is actually, you know, between one and nine percent of like threshold value. So it looks dramatic on the graph, but in actuality, it's actually not too bad.

PANEL MEMBER MESSER: Yeah. So just -- you know, that does seem to be maybe a different characteristic between the tarp and this deeper injection that the tarp --

DR. MINH PHAM: Um-hmm.

PANEL MEMBER MESSER: -- is not susceptible to peaks --

DR. MINH PHAM: Yes.

PANEL MEMBER MESSER: -- like that. And I wasn't quite sure that the bar graphs that you showed captured that difference. So I was --

DR. MINH PHAM: For -- I'm sorry for the -- between the -- the comparison between the study and the TIF tarping?

PANEL MEMBER MESSER: Yeah, the -- like if you look at the peak --

DR. MINH PHAM: Um-hmm.

PANEL MEMBER MESSER: -- over there comparing the red to the blue. Does that really capture the difference that we see on the line -- the line graphs?

DR. MINH PHAM: Yeah, so -- so the speak here is averaged out over time. So I think that's -- that's why we have a little bit of difference here. But let me -- I have this here.

PANEL MEMBER MESSER: That was my next question that if you -- if you average the peaks, they tend to go away. So I'm not sure -- maybe you should use a percentile or something like that.

DR. MINH PHAM: Okay

PANEL MEMBER MESSER: Because when you average peaks --

DR. MINH PHAM: Yeah. It's --

PANEL MEMBER MESSER: -- they -- they can flatten out.

DR. MINH PHAM: Yeah And I think it's mainly also due to the fact that its -- the samples are collected in six-hour intervals. So we're kind of -- we don't have like an hour-by-hour essentially comparison, so we try to -- we try to do it statistically to --

PANEL MEMBER MESSER: Yeah.

DR. MINH PHAM: -- to encompass what we're seeing there. But yeah, I can -- I can --

PANEL MEMBER MESSER: So it was just -- it's just a word of caution that it --

DR. MINH PHAM: Okay.

PANEL MEMBER MESSER: You know, looking at this metric, it does look like you're taking some sort of average peak value, and that might not actually capture the true peak, so just to be aware of that. And if the true peak is really an important metric, maybe you need to think about that a little more before you --

DR. MINH PHAM: Yeah. No, that's something that we do keep in mind. I think one of the things that we keep in mind here is when we come to acute exposure, especially with the Department, it's a 24-hour -- we look at a 24-hour rolling average. And then in certain aspects, we also look at a 72-hour rolling average.

So I think when -- with the peaks, it's difficult in a sense, because it's like hourly. But when we average it -- when it comes to rulemaking and our regulation, it has to be within the 24-hour, 72-hour timeframe, so --

PANEL MEMBER MESSER: Okay. So your regulatory standard is a 24-hour exposure, is that right?

DR. MINH PHAM: For this one, I think it's -- let me see. I believe it's -- it's new, so the acute is 55 ppb at 72 hours.

PANEL MEMBER MESSER: For 7 -- and that means 72 hours of exposure?

DR. MINH PHAM: Um-hmm.

PANEL MEMBER MESSER: Okay. Then I don't have a concern, as long as your metrics are aligned --

DR. MINH PHAM: Yeah.

PANEL MEMBER MESSER: -- to that standard.

DR. MINH PHAM: And I apologize for that, because when we were showing the monitoring data, it's, you know, hourly on -- we try to do hourly on field and then we have to do a little bit of mathematics to kind of fit it into this square peg that is mitigation, so...

PANEL MEMBER MESSER: And I guess the only other question being a statistician is we always like to see some quantification of the uncertainty. I know sometimes that's very hard to do with these modeling efforts.

DR. MINH PHAM: Yeah, the -- with the modeling efforts, I don't have that here, but this is -- essentially, this is just raw observation data that we -- that I put up, so it's from the monitoring study.

PANEL MEMBER MESSER: Okay. So I guess my comment would be is it possible to put error bars on those -- on those bars?

DR. MINH PHAM: Okay.

PANEL MEMBER MESSER: Thank you.

But again, it looks -- it looks very cool.

One last comment. I might think it would be possible to sort of quantify effect sizes of these different things, like moisture, and this extra six inches --

DR. MINH PHAM: Um-hmm.

PANEL MEMBER MESSER: -- of injection depth. So if you know how much reduction --

DR. MINH PHAM: Comes from each piece?

PANEL MEMBER MESSER: Yeah

DR. MINH PHAM: Yeah. That's -- that's essentially what we wanted to do. That's why each of these studies were a little bit different. We were trying to compartmentalize each of these. So the team that's doing the modeling is actually kind of teasing everything out to see what the various effects are. Obviously, it's a little bit difficult, because it's kind of a cohesive like overall effect.

But the team has been able to take a look at various soil types throughout the country -- I'm sorry, throughout the state. So if you're looking at something that's like sandy or something, they've been able to put on what happens if we do this deeper injection? What happens if we do just the water and kind of get a ballpark on that emission. So the team is using the data to kind of fill out the -- exactly what you're saying, kind of tease out specifics.

CHAIRPERSON ANASTASIO: Thank you, Karen.

So Minh, as part of your response to Karen, I think you said what the peak concentrations were and you compared them to a health guidance value.

DR. MINH PHAM: Um-hmm.

CHAIRPERSON ANASTASIO: Could you repeat that a little more slowly?

DR. MINH PHAM: So the -- so our acute -- our acute threshold -- screening level right now is 55 ppb at 72 hours.

CHAIRPERSON ANASTASIO: And what was the peak concentration you measured?

DR. MINH PHAM: The peak here, this one -- this was a six-hour average at 18 ppb.

CHAIRPERSON ANASTASIO: Okay. So not terribly below it, but below it fortunately.

DR. MINH PHAM: Yeah. Yeah.

CHAIRPERSON ANASTASIO: But yeah, but a six-hour average.

DR. MINH PHAM: It's a six hour, so we would have to kind of extrapolate that out.

CHAIRPERSON ANASTASIO: Uh-huh. Okay. So depending on the pulse and the wind, it's possible it actually could have been of concern.

DR. MINH PHAM: Sorry, Cort, what was that?

CHAIRPERSON ANASTASIO: Is it -- is it possible then that what you were saying it was 18 you measured over six hours?

DR. MINH PHAM: Um-hmm. Yes.

CHAIRPERSON ANASTASIO: So potentially -- and what was -- the threshold value was?

DR. MINH PHAM: Fifty-five.

CHAIRPERSON ANASTASIO: And that was 72 hours?

DR. MINH PHAM: Seventy-two hours, yeah.

CHAIRPERSON ANASTASIO: Oh, okay. Never mind then. All right. Thank you.

Ahmad.

PANEL MEMBER BESARATINIA: That bar chart that you showed, you said that it's an average. Average of how many values? I think you mentioned somewhere at the beginning of your talk. I might have missed it. Then you say it's average. Is it the median? Is it the mean? What kind of average is it?

DR. MINH PHAM: So most of that is all the mean values that we have. And it's -- it's cal -- I'm sorry. It's determined by all of our -- the readings from every single one our equipment around the field. So it's taken into account all 12 locations.

PANEL MEMBER BESARATINIA: How many measurement you said?

DR. MINH PHAM: How many measurements?

PANEL MEMBER BESARATINIA: Yeah.

DR. MINH PHAM: So the -- so as I mentioned before, it would be -- for the first four days, it's one measurement every six hours. That's one standard sample. And then for the remaining four days, every 12 hours. So it ends up being -- overall, it ends up being over 300 something samples that we put in.

PANEL MEMBER BESARATINIA: Okay.

CHAIRPERSON ANASTASIO: Yes, go ahead, Karen.

PANEL MEMBER MESSER: Yeah. Just following up on that, you know, that's probably not the best metric to measure a peak.

DR. MINH PHAM: Okay.

PANEL MEMBER MESSER: If you're -- if you're taking the average peak across a bunch of sites, that's probably not capturing what you need to capture.

DR. MINH PHAM: Okay.

PANEL MEMBER MESSER: So probably take some percentile, like a 90th percentile, or something like that --

DR. MINH PHAM: Yeah. We'll check --

PANEL MEMBER MESSER: -- as your measure.

DR. MINH PHAM: Okay. We can take a look at that. I think it's also because we were comparing to histor -- the his -- the way the historical day was done, so just to do and apples-to-apples comparison, but you're correct.

PANEL MEMBER MESSER: Yeah, you might not have good historical data.

DR. MINH PHAM: Yeah.

PANEL MEMBER MESSER: You know, you can imagine if you've got all these sites and only a few of them are really spiking --

DR. MINH PHAM: Um-hmm.

PANEL MEMBER MESSER: -- that would really get flattened out. So if you -- if you just look at a percentile --

DR. MINH PHAM: Yeah.

PANEL MEMBER MESSER: -- that will be a little better.

DR. MINH PHAM: Gotcha.

PANEL MEMBER BESARATINIA: I think if you use some sort of Whisker -- probably Karen is the expert in that Whisker box plot, so it will give you a better indication of variability. So you have the 25 percentile, 50 percentile, 75, as well as --

DR. MINH PHAM: Um-hmm.

PANEL MEMBER BESARATINIA: -- outlier, in case that those -- that peak is not real is due to outlier, you can see it immediately.

DR. MINH PHAM: Yeah. Yeah. And we have all -- we -- the team has like the full data set. And unfortunately, I don't have the report here, but definitely I hear what you're saying and we can incor -- incorporate that when we finalize everything.

PANEL MEMBER MESSER: And you know that might be kind of a hidden advantage of the tarp that the outputs are less variable, which might limit your -- your peak exposure. So I think it's a -- I think box plots are a great idea just to visualize the data. And then if you use some sort of standard like a percentile, that will capture some of this extreme behavior. And your modeling is probably a regression based model. I don't want to send you down a rabbit hole, but you -- there are quantile regression methods. So if you wanted to go that route, you could apply that same approach to a percentile, like 75th percentile.

DR. MINH PHAM: Yeah. Typically, we -- when we actually go into the modeling, we do look at -- our standard is like 95 percent for -- for when we look at the -- the weather throughout the state, so we try to keep that conservative. And then also for the -- it's another 95 percentile.

PANEL MEMBER HAMMOND: Don't remember what happened.

DR. MINH PHAM: Sorry. I'm hearing feedback. Sorry.

But yeah. So yes, that is something that include once we actually work out for exposure concentrations.

CHAIRPERSON ANASTASIO: All right. Thank you, Karen.

I see Kathy has her hand up, so I just asked them to mute you, but now I'm going to ask them to unmute you, and then Kathy go ahead.

PANEL MEMBER HAMMOND: Yeah. On the tarp, I was just remembering that we did them a few years ago. In the methyl iodide, there had been some concern about deer walking on tarps and opening them up. And that they did -- they're not -- they don't work as well. I think that Florida had done some work with tarps. They were actually using them with tarps and they did not work as well as people had thought. Have you looked over some of the experience that has happened with tarps?

DR. MINH PHAM: Yeah. So within our own experience and with, you know, external literature and what not, we know that animals do cross the tarp. Actually, one of the key components of the tarp is the layerings have increased over time. Initially, that tarp study in Lost Hills, you're talking about three layers. I think we're upwards to seven to nine layers, just because technology is a little bit cleaner.

So the rigidity of the tarp is a little bit better. We're -- we also have ongoing studies for how the tarp degrades or if it degrades in time with weather conditions. And we've seen that they've been able to stay pretty consistent and effective through the -- I think we went out like a month and a half, two months, which is typical for how long a tarp could sit out there for. So we've seen some of that internal study.

But yeah, when it comes to rips and tears from animals walking across or whatnot, we did take -- we do visually inspect the field for our studies anyways. We didn't notice any of that. But there is procedures in place for the applicators when a tarp is damaged. And they actually will go in an reseal specific areas of cuts or tears.

PANEL MEMBER HAMMOND: Well, and people would need to do that if they're doing it and -- on an ongoing basis. Thank you -- thank you for that.

DR. MINH PHAM: Um-hmm.

CHAIRPERSON ANASTASIO: Thank you, Kathy.

Any other comments from the Panel?

Okay. So I'd like to then move to public comment. So again, you can give your public comment either by raising your hand, in which case, we'll call on you, or you can put it in the Q&A, which I think was reenabled. Before we get to -- oh, no, I'm sorry. I'm seeing verbal comments only. So if you want to have a public comment, just please raise your hand and then we will call on you.

Before we get to people who are online, I would like to acknowledge the Panel received a comment from the California Rural Legal Assistance Foundation. And Minh, I believe that Norm has sent you a copy of this?

DR. MINH PHAM: Yes.

CHAIRPERSON ANASTASIO: Okay. Great. Yeah. So I'd definitely encourage DPR to look at it. You know, part of what the comment is about uncertainty, which Karen addressed, and there are some other, I think, important issues in there as well. So I definitely encourage you to address those.

Yeah. Thank you.

Okay. So Victor, Arash, I'm not sure how we're going to do this.

Unmute the person and then they will just say their comment.

DR. ARASH MOHEGH: Yes. We have four people raising their hand right now. How much time would you like to --

CHAIRPERSON MOHEGH: Sorry, four people?

DR. ARASH MOHEGH: Right now five. Another person.

CHAIRPERSON ANASTASIO: Five. Okay. Let's say two minutes.

DR. ARASH MOHEGH: Two minutes per person. Okay.

CHAIRPERSON ANASTASIO: Yeah. So public commenters, please limit your comments to two minutes.

DR. ARASH MOHEGH: So first we have Laura. Laura, we are going to unmute you, but you need to unmute manually yourself.

LAURA ROSENBERGER HAIDER: Well, I had a question about ethylene oxide earlier. It's inn -- that a test for COVID and a swab, and I had a chronic nose bleed for like a whole year after that in that nostril only and not on the other side. So I wanted to add patient or public experiences with it. It's also in our spices that we eat. I mean, people eat a lot of spice. Survey these people, right, or ask for public comments on health impacts that they have had.

And also pesticides, well, I've gotten exposed living across the street from a farm, but I'm not sure if it was that pesticide in particular, the 1,3-D. I think it was Roundup. And it happened later that I had like a severe allergy attack, where I was getting like chills, and like faintness, and weakness.

All right. Thanks.

CHAIRPERSON ANASTASIO: Okay. Thank you, Laura.

Sorry to hear about your exposures. We will, as part of the ethylene oxide document -- OEHHA will compile public exposures and we'll have some sense of how widespread that is. Thank you for your comment.

Next comment --

LAURA ROSENBERGER HAIDER: Also. Are we exposed to -- is there BP in fiber board that they build homes out of?

CHAIRPERSON ANASTASIO: I don't think that's a major use, but I'm not a hundred percent sure. Yeah.

LAURA ROSENBERGER HAIDER: Because I've gotten dizziness from walking into new construction buildings or tool sheds sold at Home Depot.

CHAIRPERSON ANASTASIO: Yeah. Certainly we have a lot of other volatile organic pounds that come off those building materials.

Well, thank you for your comment, Laura.

We're going to move on to the next person.

DR. ARASH MOHEGH: Next we have LaDonna. We're going to unmute you, but you need to unmute yourself LaDonna. Go ahead.

CHAIRPERSON ANASTASIO: LaDonna, do you have a comment?

DR. RAYMOND TOMPKINS: This is Dr. Raymond Tompkins, which I was using LaDonna's hook-up to get in to the meeting.

CHAIRPERSON ANASTASIO: Oh. Go ahead.

DR. RAYMOND TOMPKINS: Thank you.

One, to the last presenter in this presentation, in your presentation, you did not give me any percentage on, one, the volume of water that you used or the moisture content when you were conducting this to deal with the variables. I'm looking at possibility of adaptation of your method if it's proven to be effective in an urban setting in San Francisco Bay Area, which also I'd be very interested in the effects of your work on soil and the sandy soil, because we have an impact very much with these asphalt and with the cement grinding, where in Bayview-Hunters Point we have the highest asthma, pulmonary disease, and cardiovascular disease which is a direct correlation with particulate exposure. And this may be applicable. So please, if you can get it to me, it would be extremely helpful or if you have time to do it.

Secondly, gentlemen, I was not allowed to make any public comment on the previous two presentations this morning, which I found was very exclusionary process in the population that is professed the State of California wants to protect.

And that when I was in Atlanta back in '95 when the Monte Carlo Risk Assessment System was being presented by the author, that he had the 95 percent trigger. But the medical risk -- the medical model in this formula was a 35-year old white male. Me as a 73-year old black male, we are being excluded. But yet, if you look at all the statistics in the state of California, we have the highest mortality and morbidity rate.

Dr. Tomás Aragón showed in breast cancer for African American women, given all the social economic with insurance and everything else, black women in San Francisco died 77 percent higher than their white counterparts. We need this delineation. I need to look at genetic variances and susceptibility in your model when you're assessing risk.

I have talked with Dr. Faust at other --

CHAIRPERSON ANASTASIO: Dr. Tompkins, I'm going to have to cut you off. I'm sorry.

DR. RAYMOND TOMPKINS: I'm sorry. I didn't get a chance to speak earlier.

CHAIRPERSON ANASTASIO: Yeah.

DR. RAYMOND TOMPKINS: I wish you would allow the public more time to speak on these issues.

CHAIRPERSON ANASTASIO: Yeah. We are only taking public comments on items that are related to AB 617, Community Air Protection Plan. So our other items of business we do not take public comments. I'm glad you were able to comment on this. I imagine, Minh, could he contact you for the details of the water content?

DR. RAYMOND TOMPKINS: I would really appreciate it.

DR. MINH PHAM: I can just give that right now.

CHAIRPERSON ANASTASIO: Okay. Go ahead and give it.

DR. MINH PHAM: So typically for the water treatment, we're looking at one to three inches between a day to three days ahead of the application cycle. As far as field capacity, typically 1,3-D right now is anywhere between 25 to 50 percent field capacity. We were looking to up that, so anything above 50 percent. So I think our threshold was between 50 and 80 percent.

DR. RAYMOND TOMPKINS: Sir, my question was what was the constant moisture content of the soil? Like the American Standard and Measurements says 12 percent is what you need for not having dust leaving the work site or others are trying to retain. Is the -- did you measure the soil content of moisture? Is it five percent, 10? When you did the deep injections, was it higher or lower? That gives me an idea when talking to the air district board of what injections and the water content should be used, especially when we're in a drought.

DR. MINH PHAM: Yeah. Appreciate that, Dr. Tompkins. So, yes, and so we're look -- we're talking about field capacity we're talking about these -- these fields. So I'm unsure on the metric that you were speaking about before. But 50 to 75 percent field capacity is the capacity of which that field can hold water. So that's the -- that's the metric that we use. So I don't know if that answers your question.

DR. RAYMOND TOMPKINS: I hope if I could contact one of the members on the Panel that we can get together and have a discussion, because I'd like to utilize this in an urban setting, if possible.

Thank you.

CHAIRPERSON ANASTASIO: Thank you for your comment.

DR. ARASH MOHEGH: Next comment. Next, we have gen Jane.

Jane, you can unmute yourself now.

JANE SELLEN: Hi. Yeah. This is Jane Sellen with Californians for Pesticide Reform. I was told I'd have three minutes, so if you don't mind, I'm going to take just a little bit more than two minutes but less than three.

Thank you for the opportunity to comment. On behalf of the CPR Coalition we welcome the attention of the SRP on 1,3-D, a chemical that's the source of profound and ongoing broken trust toward DPR by our coalition. In addition to being a toxic air contaminant, 1,3-D is also a volatile organic compound, Prop 65 carcinogen, banned in 29 countries, and yet is the third most heavily used pesticide in California.

It's also extremely drift prone with a recent exceedance recorded at Shafter originating in an application more than seven miles away according to DPR. Under rules that Dow was allowed to write, implement, and monitor, use per 6 by 6 mile township was limited to a 90,000 pound cap, but waivers were routinely granted and unused pounds from prior years were allowed to be rolled over.

We now know from PRA obtained emails, that industry lobbyists asked DPR back in 2007 to raise the cap to 135,000 pounds, and that then there would be no more need for rollovers or waives. And in 2016, DPR obliged, recalculated the lifetime cancer risk level over the strenuous objections of OEHHA and increased the use cap to 136,000 pounds.

At this point, CPR and PAN sued DPR and Dow. We won, a win that was recently upheld on appeal. DPR is now under court order to create a lawful regulation and to work on the regulation in concert with OEHHA.

This background is relevant to my comment today, because the thrust of DPR's action on 1,3-D continues to be focused on finding ways to allow its continued unchecked use. For its rulemaking, DPR is relying on small and limited pilots to test ways to reduce emissions as reflected in what Minh Pham called the key question in his presentation, which was are there ways to achieve reduction in emissions similar to TIF tarping?

I'm almost done.

A key -- better key question might be how do we reduce agriculture's reliance on this highly hazardous and drift prone chemical? DPR evidently has no intention of doing anything in its rulemaking to reduce ongoing alarmingly high use or to challenge the system of industrial agriculture that necessitates the use of soil sterilizing chemicals.

We affirm the comments in the letter to SRP by our colleague Anne Katten and asked that you weigh her comments carefully as you scrutinize these pilots that are intended to inform the rulemaking. After decades of failed oversight of this hazardous chemical, DPR's actions warrant particular scrutiny. What's at -- what's at stake is the health of millions of the most vulnerable people in

California's farm working communities.

Thank you for your time.

CHAIRPERSON ANASTASIO: Thank you very much, Jane, for your comment.

Next comment

DR. ARASH MOHEGH: Next we have Sarah. Sarah, you can unmuted awe yourself

SARAH AIRD: Oh, thank you very much. I'm going to second. So This is Sarah Aird with -- also with Californians for Pesticide Reform. And I would just like to reiterate many of the comments that Jane Sellen just made, and again to highlight that we are in full, a hundred percent support of the letter submitted by Anne Katten of the California Rural Legal Assistance Foundation.

And I'll just add a couple things for those of you who haven't had a chance to look at that letter yet. So, first of all, we do remain concerned, as Jane mentioned, that there is an emphasis on mitigations and reducing emissions exposure as opposed to reducing use. 1,3-dichloropropene is actually banned in dozens of countries and it's time that that be the focus in California, not just emission reductions.

But in addition, we urge and second also comments that were made here by expert scientists on the needs for incorporation of uncertainties when estimating fumigation method emission rates from the pilot study results. We also support the selection of 55 parts per billion as a target level for acute effects, but conclude that this should be a 24-hour target concentration rather than a 72-our concentration.

That's also in concurrence with CARB's comments adjusting that a 24-hour target concentration is needed, so that ambient air samples of 24 hours in duration may be used to evaluate if the target concentration is being exceeded. Since air concentrations are only measured once a week, modeling will need to be used to estimate three-day average air levels. However, as OEHHA has pointed out in a few recent incidents, the results of air modeling markedly underestimated the 24-hour levels monitored.

And finally, we believe the systemic approach should be used in risk management because it is more health protective, and the peer reviews from scientists at the Office of Environmental Health Hazard Assessment and Texas A&M University both recommend use of the systemic approach for calculating cancer potency, because lung tumors are found in mice exposed in oral as well as inhalation studies.

The most recent analysis done OEHHA of 1,3-D cancer potency also used this systemic approach. The portal of entry approach is typically used for irritant chemicals not carcinogens.

Thank you very much for your time.

CHAIRPERSON ANASTASIO: Sarah, thank you for your succinct summary of the letter. I appreciate your comment.

Next commenter.

DR. ARASH MOHEGH: Next, we have Caroline. Caroline, please go ahead and unmute yourself.

Care oh line

CAROLINE COX: Good afternoon. This is Caroline Cox. Can you hear me okay?

CHAIRPERSON ANASTASIO: Yes, we can.

CAROLINE COX: Yeah. I mostly want to support the comments just made by Jane Sellen and Sarah Aird. I did want to focus a little bit of attention on the specific results of the mitigation pilots. You know, I understand the difficulties in carrying out field studies, but the -- the basic design of the study where there's actually no controls, just using historical controls would not really be acceptable under most scientific scrutiny.

That said, I also wanted to reiterate the point that the 24-hour averaging. To work with the 72-hour average, which actually DPR and/or CARB are not set up to monitor for, just means that it will be impossible to enforce. So I urge you to take a close look at that.

Thank you.

CHAIRPERSON ANASTASIO: Thank you, Caroline for your comment.

Do we have any more comments?

DR. ARASH MOHEGH: No.

CHAIRPERSON ANASTASIO: No, that's the final comment. I'd like to thank everybody who commented. We appreciate your input and we are now going to break for lunch. We will reassemble in 30 minutes, which is 1:05, to hear our last informational item. So, Panel, please come back by 1:05. Thank you, everyone. And thank you, Minh, for your presentation.

(Off record: 12:33 p.m.)

(Thereupon a lunch break was taken.)

AFTERNOON SESSION

(On record: 1:07 p.m.)

CHAIRPERSON ANASTASIO: Welcome back, everyone. We're going to continue our Scientific Review Panel meeting. I'm going to wait till we have the right slide up on the screen there.

(Thereupon a slide presentation.)

CHAIRPERSON ANASTASIO: Beautiful. Thank you, Arash.

So our final major agenda item today is our third informational item, where we're going to get an update on the Community Air Protection Program from Dr. Brian Moore, manager the community Planning Section of CARB's Office of Community Air Protection.

Brian, please take it away.

DR. BRIAN MOORE: Great. Well, thank you all and good afternoon. This is reminding me of the dreaded after lunch block, when I used to teach.

(Laughter.)

DR. BRIAN MOORE: So I'll try to be as interesting and concise as possible. And again, thanks again. My name is Brian Moore and I manage the Community Planning Section in CARB's Office of Community Air Protection. I would like to just thank by -- start by thanking you all for letting us update you on progress to our -- on our program to date.

Go ahead, next slide.

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DR. BRIAN MOORE: There we go. Thank you.

So this update we've broken up into kind of three components. The first on the left are looking back and updating you all on kind of progress -- recent progress to date. And then the one on the right is looking forward with the program.

So first, we'll discuss our last round of annual community selection, which happened in February and then I'll just give some high level summary points from our annual program update that we gave to our CARB Board that is available online that I can share with anyone who's interested. And then finally, I will discuss the statewide strategy revision process, which is like our huge emphasis this year, our focus moving forward, to actually update our guideline document for implementation of this program.

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DR. BRIAN MOORE: Starting with annual community selection. So this last February, at our CARB Board meeting, our Board selected two new communities for the program, East Oakland in the Bay Area and the international border community, down south of San Diego by the southern U.S. border with Mexico.

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DR. BRIAN MOORE: So just to give some details on East Oakland. East Oakland was selected for a Community Emissions Reduction Program. So that means that they will develop with community members, and the air district, and other partners, a plan fully of strategies to reduce emissions, specifically in the East Oakland community, as well as mitigation and exposure reduction strategies.

The East Oakland community is about 20 square miles in size with a population density of around 12,000 people per square mile. The map on the left gives a general idea of the community, but the final boundaries will be decided by the community steering committee members theirselves when that group is organized, hopefully by July. There are several emission sources of concern in East Oakland, including industrial facilities, freeway traffic, rail, and freight facilities all through that area.

The Bay Area Air Quality Management District has been partnering with local community-based organizations and residents to design the community steering committee. And gain, they hope to convene that within the next few months, by July at the latest.

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DR. BRIAN MOORE: The second community selected was the international border community. This community is about 24 square miles with a population density of 3,000 people per scare mile. The community is home to two ports of entry. So it covers San Ysidro and Otay Mesa. So many of the air pollution concerns in this community are associated with these ports of entry, so heavy-duty truck traffic, commerce on a lot of the freeways throughout the area.

The air district has already deployed black carbon analyzers in the community to support this recommendation. And the community has met twice so far and is in the process of finalizing their community steering committee membership as well as their boundaries, so they're well on their way.

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DR. BRIAN MOORE: So those are the two communities selected this past year in February. I thought it would also be helpful to go over the considerations that CARB staff used to recommend communities, as well as the considerations that our Board uses to select them just kind of to revisit this.

So this is a kind of semi-quantitative exercise. We definitely look at air pollution emissions -- sorry, emissions inventories and other exposure metrics. We also use CalEnviroScreen, the Healthy Places Index, other tools to look at vulnerability measures within these communities.

And that third bullet is something we really emphasized at the beginning of the program under direction from a lot of community leaders and other stakeholders was that to make sure there's some regional and source diversity in the communities we select. So not only did we want to get communities throughout the state, but then also ones that experience different air pollution burdens from different types of sources.

So we have port communities, like West Oakland and Long Beach area in our program, as well as more rural communities like Eastern Coachella Valley, Shafter, Arvin-Lamont area. And we also do have really urban areas like in the LA basin, like East LA. So we try to use these first-, second-, and third-year communities to help us develop successful strategies that could then be rolled out to other communities with like sources.

The next bullet -- so strongly supported communities. This has been a knock and a valid knock on this program. Because we can only select so many communities every year due to just resource availability, we have been trying to prioritize the communities we see most strongly supported throughout the state. We have some communities that community members have organized and have put themselves forward and nominated their communities for this program, year in and year out. So that was definitely a priority with the selection of these communities.

And then again, that last bullet though is resource availability. The last three years, funding for AB 617 has stayed flat. But then every year, statutorily, we're required to at least consider adding new communities to the Program.

So that has limited our ability to grow the program, but that also leads into this kind of big revision we're doing this year of our guidance document to try to get creative to find other ways to reach more people.

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DR. BRIAN MOORE: So now I'll kind of transfer into our annual program update. So we have seen movement on many unique strategies in our first and second year communities, especially, since they are now like beginning implementation, past program -- plan development.

Here are some examples. So in the Shafter community, they were able to replace 150 gas-powered lawn garden pieces of equipment with electric models all in one day through kind of streamlining the incentive process down in that area, where there's a day where people could bring in their gas-powered mowers, and air district staff and volunteers took the gas mower out, put the electric mower in and they were on their way. So they really cut through a lot of the red tape associated with that incentive program. And that was pretty successful. And we see that being implemented in other valley communities.

Also, in several communities, steering committees have included school air filtration as a strategy in their plans. We've seen that throughout the state. And with that, as another kind of exposure mitigation strategy, we've seen urban greening and vegetative barriers being adopted by many of our communities in LA as well as in the Central Valley.

And I think these two points hit at something we've seen with community members. They really are giving us direction and desire immediately exposure reduction, right? They definitely concentrated on reducing emissions. But in the short term, the sooner they can reduce exposure, especially in sensitive populations, like kids, day care facilities, hospitals, that has been a focus. So we are seeing a lot of exposure mitigation strategies versus just the traditional emissions reduction strategies.

Another big concern throughout the State is land use. And this is something that we have found as a challenge to work with land-use agencies, because it isn't something, you know, that has been directly, historically under CARB's control or the air district's.

So we see in South Central Fresno, the community steering committee got together with the air district and they're developing a partnership with the City of Fresno. And the idea is to coordinate more closely on the area impacts of proposed land-use projects through early review and discussion of proposals during the pre-application process. So this is one of the examples of this kind of cross-agency collaboration in trying to bring along partners that aren't necessarily by law required to participate. So getting the city involved in Fresno is -- I mean, it's been a relatively, you know, rocky road, but they're there at the table and they've been participating, so we're moving forward with that.

And as a final example, the El Centro, Heber, Calexico corridor community, they're conducting a truck study to evaluate alternative routes going in and out of those ports of entry to see if there's someway to redirect traffic to reduce exposure to people who live along those routes.

And so again, all -- all these are examples of promising strategies that we've been developing, the pace of implementation, as well as our responsiveness to community driven direction, is something we can always improve on and continue to try to do that.

So there's a lot of change going on in this program and we're hoping this year can really catalyze even more change.

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DR. BRIAN MOORE: Before I finish the annual program update, especially with this -- this group, I want to make sure I touched base on what air toxics of community concern are being tracked by CARB now. And many of these you mentioned just today, so -- and as a side note, I am not a chemist or toxicologist. So I apologize for any mispronunciations. I couldn't hack physical biochem, so I became a physiologist.

(Laughter.)

DR. BRIAN MOORE: So -- but I'll give it a shot, so -- and if you do want any more information on any of these items, we can put you in touch with our

Transportation and Toxics Division either in another format like this, or through email, or anything like that. So I will definitely get back to you if you have questions.

So a big with the metals. So metal processing forging, fabrication, finishing and welding is a big concern, like chrome plating types of activities, especially in LA. What was mentioned earlier today, so ethylene oxide from sterilizers used in medical applications have also been mentioned at the community level.

PAH and particulates from charbroiling -- commercial charbroiling is also a concern of the community and so have been working on ways to -- of control technology to reduce exposure to that. What else do we have?

Oh, yeah, residential wood burning comes up now and again with concerns just about VOCs like benzene and formaldehyde maybe from manufactured, you know, wood being burnt in residential fireplaces is also a concern of community members, as well as those consumer product fume suppressants in chrome plating has also been a very big concern and is on our toxic staff's radar for sure, because it was a big concern of the community.

And I believe that even though CARB as of now does not have the authority to regulate stuff like PFAS and some of those things used in suppressants. We are starting to track it in our inventory, so at least we'll get an idea of where it's being used and how much is being used moving forward, which will really help.

And also mentioned -- I think it was also mentioned earlier today some solvents, like 1,3 -- 1-BP. It was mentioned earlier. It's also a concern to many communities throughout the area.

And finally, oh, pesticides, which was just covered by Minh. DPR has been a really involved partner with our group. Four years ago, we didn't have much contact with DPR and now we work with them almost on a daily basis in a lot of these; communities. So like Minh mentioned, a lot of the pesticides concerns are with the fumigants that he brought up, and especially in our Eastern Coachella Valley area and obviously though the Central Valley of California.

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DR. BRIAN MOORE: Just to -- oh, that did not transfer well. I apologize for that slide. I can kind of talk through what -- well, it's the right side -- slide sorry. But, yeah, it looks like that the formatting didn't show through.

So just to give a broad update on our program, the left side is just a map of California representing where the current 17 communities are located throughout the state. And the right side, each one of those blocks represents a stage of program development or implementation. So the bottom box with those seven communities, those are our first year communities that we selected almost four years ago now. And so they're like in their second year of implementation.

So they're to the point of actually trying to get these strategies implemented and getting emissions and exposure reductions. And then at the very top, those are our newer communities, which are just in plan development, right? So they haven't gotten to the point yet, where they are actually implementing any of the strategies. They're in the strategy creation phase.

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DR. BRIAN MOORE: So this is the -- those are the two kind of looking back items and this is our looking forward item for today that I wanted to closed with. So this is the statewide strategy revision. So just as a -- kind of a primer, CARB's statewide strategy is captured in our program blueprint, which I'm sure most of you have heard of, so that's our guidance document. And by statute, we're required to update that statewide strategy at least every five years.

And so that five-year mark is coming up in September of 2023, so not too far away. We have started brainstorming and working with community groups regarding how we go about updating this guidance document. And a big part of it has been the AB 617 consultation group that many of you may be familiar with. And this group is just a multi-stakeholder group composed of environmental justice advocates, air district staff, academics, as well as industry.

And they have been discussing this revision process over the last well, you know what, I would say that within a year and a half in the program - it's a new program - everyone realized changes needed to be made to our guidance document. So starting probably a year and a half after the first blueprint and guidance document was approved by our Board, we started keeping a running list of changes, you know, of input from community members of things that needed to be updated.

And so they've been working on that for a while. And a big push with the consultation group was they developed a subcommittee that helped to try to take all these concepts for revisions and put them together in a list to go through. And within that subcommittee, we actually had a few community EJ leaders volunteer to develop what they call a People's Blueprint. So they took all the input, their own experiences, and developed a guidance document of their own. CARB supported with some technical writing grant, but did not -- did not edit or review the draft -- the version at all.

So that People's Blueprint has really been the starting point for review, discussion, and comment by the full consultation group and is kind of like one of our main inputs going forward with our statewide strategy revision. And then again in addition to the AB 617 consultation group, we plan on conducting extensive meaningful and targeted stakeholder engagement to help us kind of reset this program over the coming year and a half.

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DR. BRIAN MOORE: And so this -- since we are towards the beginning of this statewide strategy revision, I just wanted to throw up some concepts we have heard repeatedly over the last few years of the program that we think are critical to this program reset. And I'll just call attention to a few of these tiles. The first one on the top left is racial equity. We've heard loud and clear that we need to create a racial equity framework that just throws -- flow throughout and is threaded throughout our document and that was something that was woefully missing from our first version.

Community engagement, that second kind of middle top tile, we are planning on going above and beyond the usual CARB public comment process where a document is posted for a online comments, and then we review them, and then write a draft. So over this next year and a half, we plan on doing a lot of community engagement going out to communities to get direction on how this document should be composed.

And then the last kind of tile I just wanted to highlight where the alternative models tile there at the bottom. We're thinking of ways that we can expand program benefits past this traditional method of selecting communities, because one, it's just not -- we're not reaching enough people fast enough. So as an example some of -- for some of these alternative models, our Enforcement Division is starting a community enforcement -- community focused enforcement effort, where they are actually going out to the community, meeting with community members, going on tours, and the community is helping almost design the enforcement plan. And for lack of a better word, our Enforcement Division is acting kind of like the contractor and then trying to implement that plan. So that's one thing we're trying out.

Also, we have community air grants that are grants that go straight to community groups, which help with capacity building, community air monitoring. And we're trying to expand that program to the point where we actually have an awardee this year that is taking a community air grant and developing kind of a ground up -- I think they call them like local emissions reduction programs, where they're working with the community members to develop strategies to reduce emissions. And then once they form that plan, the current thought is then, you know, CARB and the air district can help them implement that, you know, so less top-down, more bottom-up model with these emissions reduction programs.

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DR. BRIAN MOORE: Oh, you know what, Vick, you can just hit it like five times. We'll get the whole timeline out there.

Awesome. Perfect. So -- and just to end with kind of our timeline for the revision of our statewide strategy. So in late 2021, again that People's Blueprint was completed and the consultation group has been reviewing that up till now. And we're in May now, so actually next week, we're going to have a CARB Board informational update on the statewide strategy revision. So it's a -- I think the item will start at 4 p.m. on Thursday and it's actually down in Riverside, but will be webcast. We're starting that program blueprint revision process. And we hope to have a draft outline of the program blueprint within the next few weeks, which really kind of represents kind of a list of concepts like the tile graphic I showed earlier.

We're hoping by the summer of 2022 maybe in August that the consultation group has completed the review of the People's Blueprint and giving -- giving us comments. And then late '22, early 2023, we want to go out to the public with workshops. We're going to have more consultation group meetings, and maybe some different forms, maybe stakeholder focus groups. We're really open to any and all forms of communication that can add value to this process under the direction of our community members.

And we're hoping to post a full draft of our program blueprint early 2023, and then a final draft after public comment before September '23 -- 2020 -- excuse me 2023 in which our Board will act on the blueprint and we will make that statutory deadline. And again, there has been some concern from community members that they want this to happen as fast as possible. So we are moving quickly to maybe beat this deadline by as much as we can, but we want to be thorough and do it right, so we're definitely not going to rush.

Cool. And next slide.

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DR. BRIAN MOORE: And that's I'll have. So I'm more than happy to answer any -- any questions from the group, or you can call me, or email me at another time. Yeah.

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

Are there comments or questions from the Panel?

Mic, Joe.

PANEL MEMBER LANDOLPH: What can you tell me about East LA? I work there in Boyle Heights at USC.

DR. BRIAN MOORE: Oh, wow, so that is -- that is right within the area. That consultation group -- that was one of our first selected communities. So they're in -- deep into implementation. What I can tell you about East LA? If you are interested, we have community -- CARB has community liaisons that have been attending every community steering committee meeting and work really closely with the air district and community members. We put out annual reports. So if you want, I can get you information. There's a -- there's a lot happening as far as Mobile Source Strategy reductions. They're looking at rail, you know, in that area, because of the railyard right there. So, yeah, it's been progressing. South Coast Air Quality Management District is partnering with the community, you know, in that endeavor. But, yeah, there's a lot. So, yeah, I can. I more than willing to do some --

PANEL MEMBER LANDOLPH: Yeah, I'll leave you my card.

DR. BRIAN MOORE: Yeah, that would be great.

PANEL MEMBER LANDOLPH: Thank you.

DR. BRIAN MOORE: And you're -- and you're more than welcome. These are all community meetings that we post to our website. And, yeah, anybody is welcome to come to these community steering committee meetings, yeah, that would be great.

CHAIRPERSON ANASTASIO: Beate.

PANEL MEMBER RITZ: So since these are geared towards immediate reductions, do you have an evaluation program going along, so you can actually see it has an impact, and not only on reduction, but also on health outcomes?

DR. BRIAN MOORE: That's a great question. We're trying. What's been very difficult is because -- well -- well, from the emissions reductions standpoint, we have a lot of really novel strategies that have to do more with exposure reduction. So historically CARB regionally -- we're all about emissions reductions, right? So our calculators are based on replace that switcher at that railyard. You get so much reduction DPM, right?

Well now, we're seeing vegetative barriers, truck rerouting. So -- on exposure mitigation, right? So rerouting trucks may not reduce emissions at all. It could maybe increase them a little bit, but it may drastically reduce exposure, which could improve health, right? So we right now are working with air districts to work on ways to capture those benefits that historically haven't.

There has been a push. We'd love to have metrics that are the same across the communities, but then also we were trying to walk this line where the whole point of AB 617 was to let the communities develop community-specific strategies. So a lot of times the metrics that one community has picked to track are different than another.

So right now, that is one thing we are working on and in this revision is finding maybe at least a core group of metrics that can be accepted across communities to track. But just because somewhere like East LA sees a lot of DPM reductions and maybe, let's say, El Centro doesn't, it doesn't mean that El Centro -- there's something wrong there. I mean, El Centro is focused a lot on retrained dust and like different things, right?

So there's kind of that -- that need to make sure we can look at the program holistically to make sure we're being successful, but then not get too caught up in comparing across communities, because of the source diversity. But you're right, like the health outcomes has been something community members have been -- been calling for to figure out some way we can track health before and after a strategy is implemented.

PANEL MEMBER RITZ: An, I mean, if it's really true that it's not an average lowering of the particles, but where the particles are and maybe particle toxicity, if you have vegetation that filters out the finer parts, then what you could probably do is look at the response -- physiologic response to some of these pollutants right? And there are ways to do that, because there are more and more articles out there actually showing what the oxidative stress response is, and the urine measures you can take or what's the inflammatory reaction that's blood based. And, you know, if you show that you have less in these communities across, then, you know, you've been probably quite right on. But you need to be careful in what you're looking for, because long-term health effects is -- you can't look at, but short-term health effects you could.

DR. BRIAN MOORE: Well, I'm so glad you brought that up. And I apologize to all the OEHHA staffers, Dave Edwards, if he's on this call, they've been helping us out a ton. So OEHHA actually received some funding to help assist with AB 617. So like what you're saying, we have actually a couple situations where our Research Division is maybe doing an air fill intervention and OEHHA has been able to biomonitor before and after.

So we are looking at stuff like that, but you're right, making sure we interpret the results correctly and there aren't false assumptions about what we're seeing, but yeah, I agree with all that -- that's been said. And OEHHA has been a great partner as well.

PANEL MEMBER RITZ: Right. And I mean the South Coast Air Quality Management District is very much aware of the PurpleAir monitoring network. And that might also be a great -- because it's so dispersed, right? And it gives you a totally different picture.

CHAIRPERSON ANASTASIO: Thank you, Beate.

Ahmad.

PANEL MEMBER BESARATINIA: On your slide number eight, you have listed the air toxics community concern. One of the items is charbroiling. I'm -- just out of curiosity, I'm wondering what is your target audience? Is it the industrial restaurateurs or is it like residential users, and how are you going to kind of target this audience specifically?

DR. BRIAN MOORE: That's a great question and I want to make sure I answer it very concisely, because this has been -- this is more -- this is a great example of one of the challenges in program at whole, because when charbroiling was first shown, like on an inventory, there was some Assumption by community members, they think charbroiling, barbecuing. We're talking about outdoor barbecue pits, out front of like a storefront or even residential barbecuing, right? And there was a miscommunication we had in some communities where that inventory space on commercial charbroiling, which you see at like fast food restaurants and stuff like that.

So initially there's some concern they didn't -- that the community did not want to penalize small family-owned businesses that were using outdoor grills, right? So then once we cleared it up that there is also -- we're seeing a lot of this a commercial charbroiling and there are ways in -- especially with new construction to develop methods to control come of these emissions, they saw those two things as being different.

So, yeah, so there's -- we -- actually, that has been conflated before, but as far as we're concerned with our inventories, we're looking at that commercial charbroiling that we see, like under fire, chain-driven kind of stuff that we're trying to look at controls for, that the community members are interested in, because in some of these communities, I mean, it's -- it's tough, like you -- you smell -- I don't know if you -- you drive by a refinery, and smell something, you cover your mouth and walk the other way. You walk by a burger place and you smell stuff, you're like, oh that smells great. But I mean, that's PM, right, and there can be some VOCs in there and all that.

So I think there is a drive to look at reducing commercial charbroiling emissions, because in some communities it is a pretty big slice of the PM pie for sure.

CHAIRPERSON ANASTASIO: Thank you, Ahmad.

Joe, did you have a question?

PANEL MEMBER LANDOLPH: They had a battery recycling factory not far from East LA, which was blowing arsenic and lead of all things into the community. And some of the homes had to have their topsoil excavated and disposed of. Do you know what the status of any of that is?

DR. BRIAN MOORE: I don't want to get the wrong place. Is this the Exide facility --

PANEL MEMBER LANDOLPH: Yeah.

DR. BRIAN MOORE: -- kind of close to Long Beach?

PANEL MEMBER LANDOLPH: Yeah.

DR. BRIAN MOORE: Yeah, I don't know the current status, but I can -- I can check on that for you.

PANEL MEMBER LANDOLPH: Because I know it went to court and the defendants went bankrupt. And then as I understood it, all the legal action ended at that point.

DR. BRIAN MOORE: Also, most of my work is done in the Central Valley, but when I first started this program, so that's 2017 or '18, we took a tour of that facility.

PANEL MEMBER LANDOLPH: Um-hmm.

DR. BRIAN MOORE: And there's some really involved community advocates that were pushing on that. So I'll make sure to find out the status of that for you.

PANEL MEMBER LANDOLPH: Thank you.

CHAIRPERSON ANASTASIO: Thank you, Joe.

Any other comments?

I have one comment for you, Brian. So you talked about limited financial resources and you're adding additional communities. Is the plan to sunset communities at some point

DR. BRIAN MOORE: Well, we were hope -- we -- when we select a community, we consider that like an

11-year commitment. So we have one year for the development of the pro -- the plan. We have a five years milestone that we want to see. We think five years -- at least initially -- the may change in the new blueprint. We thought five years was a short enough time to make things happen quickly, but long enough, so you could see some results just based on our experience with regulation. So we have that five-year milestone and then we also want to stay within that community for another five years to make there isn't any backsliding and that we still see these improvements.

So each community selected, we think of it as being there for at least 11 years, and we also with trying these new models, we don't want to take away an option that has been working for some communities. So we expect to continue supporting this kind of traditional community selection model. If -- if an air district and a community group want -- have the resources and want to pursue this traditional model of community selection, we, by no means, want to take away options that have been working, so that is -- there will be another challenge moving forward, but yeah we -- we're not -- definitely not sunsetting any of those communities.

CHAIRPERSON ANASTASIO: Thank you.

Any other Panel comments?

All right. Seeing none.

We will move to public comments. Do we have any public comments?

DR. ARASH MOHEGH: We have one public comment from LaDonna.

CHAIRPERSON ANASTASIO: Okay.

DR. ARASH MOHEGH: And they wanted to know -- wanted us to know that previously from the previous item, they raised their hand and they were basically representing two people, so they have a comment from the previous item. I don't know if they have a comment on this item too or not.

CHAIRPERSON ANASTASIO: Oh. Okay. Why don't you allow them to speak and we'll see what they have.

Thank you, Arash.

DR. ARASH MOHEGH: Okay. LoDonna, can you go ahead and unmute yourself, please.

DR. RAYMOND TOMPKINS: Hello.

CHAIRPERSON ANASTASIO: Hello, yes.

DR. RAYMOND TOMPKINS: Can you hear me?

CHAIRPERSON ANASTASIO: Yes, we can. Is this Dr. Tompkins?

DR. RAYMOND TOMPKINS: Okay. This is Dr. Tompkins. LaDonna had to leave. I've been -- somehow we've got to work on the Zoom connection. She had to forward me her connection so I could communicate with you.

Technology, it doesn't always work perfect. We've got to admit that.

CHAIRPERSON ANASTASIO: We can hear you fine, so please go ahead.

DR. RAYMOND TOMPKINS: Okay. Thank you. To the presenter, could you please show your slides that you had your different goals, because I want to get some clarity in and that. And I look forward to talking to you in Sacramento as well.

DR. BRIAN MOORE: Sure I think that -- you mean, like the timeline or that I had one with like tiles on it that had --

DR. RAYMOND TOMPKINS: You had tiles like --

DR. BRIAN MOORE: It's number 11.

DR. RAYMOND TOMPKINS: -- one of the very -- at the very beginning.

DR. BRIAN MOORE: I think it might be either 11 or 2.

DR. RAYMOND TOMPKINS: I did -- I couldn't help here. Sorry.

DR. BRIAN MOORE: So I had -- oh, no problem. So one of the tiles, 11, I had six tiles that talked about the concepts we're trying to include in our guidance document revision. And those --

DR. RAYMOND TOMPKINS: Yes. Can you put that up there?

DR. BRIAN MOORE: Okay. I got it. I think we're trying to right now. So, Victor, that is number 11.

DR. RAYMOND TOMPKINS: I hope the clock can slow down on me, so we can get to it perfectly.

Racial equality. In your inclusion in this concept, I am pleading with you, if you want to change this, that the methodology employed in risk assessment be more inclusive of the population. I've worked in East Oakland and West Oakland with Ms. Margaret and in Richmond in the Bay Area, and as well as Bayview-Hunters Point. And it is both black and brown people that are most heavily impacted, and unless the risk assessment is utilized their risk genetic susceptibility. I have a problem where I just finished doing VOC studies in Bayview-Hunters Point. And I have benzene for a 20-year period that we measured that exceeds the cancer risk 1 in 100,000 over 574 percent above that level. And we had a peak coming off of the Naval shipyard at cancer risk life-time exposure 1 in 10,000. We need the measurements for susceptibility.

We have susceptibility but for one G6Pd was 16 percent for African Americans. And sickle cell, when I did a field study and sampled the population, it was four percent. That's a 20 percent increase in susceptibility. The question is what is the cancer risk for this population? This is what I'm after. We need that inclusive process and taking in these other variables that are unfortunately was developed in the 1940s during wartime, did the barrel spill over and you're measuring high-dose exposure, which then it said it was predominantly afterwards white males and didn't include a real depiction, just like the silliness of the original breast cancer studies done in the United States were done on white males that have less than one percent chance of developing of breast cancer, but on women or women of color that Dr. Tomas showed in San Francisco had a 77 percent.

So I'm pleading for an inclusionary process. Don't just engage the community and give us rhetoric. We need real science to be practiced to save lives. And I think AB 617 is mechanism and a tool to incorporate these variables of the past that have not been included and take us into the 21st century. And that is my advocacy of putting best practice. I need to leave the BS, bad science, behind and look forward in how we can work together in saving lives. Because every month I've had to say goodbye to a friend out here in San Francisco, and it's directly related. And I'm also chairman of the Board for Biomonitoring in Bayview-Hunters Point. So I'm working with doctors and toxicologists in this area.

Please, let's look at a more inclusive process, because we're dying in disproportionate numbers.

Any comments to me?

DR. BRIAN MOORE: Well, I just want to say thank you, Dr. Tompkins. I heard you make these same and other great points in the health risk assessment workshop last week. So we've heard you and we work with that group. And you're always willing to reach out to me to like -- you know people much higher up the chain than myself, so -- but if you do want to sen me off an email.

(Laughter.)

DR. BRIAN MOORE: I know you worked with Veronica Eady and people over there at Bay Area, but yeah, anyway we can connect and move this forward, yeah, I'm here.

DR. RAYMOND TOMPKINS: Yeah. Everybody. It's not about me, as Dr. King said, it's about we shall overcome. And together, we can come together and make a difference, rather than people trying to play us off the politics of science, but that if we argue for good practices and good practices in science, I think we can do -- make a difference.

And thank you, Brian. I look forward to talking to you.

CHAIRPERSON ANASTASIO: Great. Thank you, Dr. Tompkins for your comment.

Arash, do I see someone with a hand up on Zoom?

No.

Okay. So I believe we're finished then with public comment?

DR. ARASH MOHEGH: (Nods head.)

CHAIRPERSON ANASTASIO: Okay. Great.

Well, Brian, thank you very much for your presentation. We appreciate the update on community air protection matters and we look forward to your next one. And good luck with the revision of the program guidelines.

DR. BRIAN MOORE: Well, thanks a lot.

CHAIRPERSON ANASTASIO: All right. That ends our planned business.

I just have a few administrative points. First one is Norm just sent out an email to set up the time and day for our fall meeting. If you haven't yet responded to his poll, please do so. And as always, please be very generous with your availability, so that it will make it a little easier to schedule things.

With that, I believe we have exhausted our agenda, so I am looking for a motion to adjourn.

PANEL MEMBER MESSER: So moved.

CHAIRPERSON ANASTASIO: Do I have a second?

PANEL MEMBER BESARATINIA: (Hand raised.)

CHAIRPERSON ANASTASIO: All in favor?

(Hands raised.)

CHAIRPERSON ANASTASIO: Fantastic. Unanimous. Thank you, everyone, for coming today. It's good to see you in person after two years of seeing you as a little rectangle. And I look forward to seeing everyone in the fall. And thanks all to Hnin Hnin, and Norm, and Arash, and Victor, for all their hard work making the meeting happen.

All right. Thank you.

(Thereupon the California Air Resources Board, Scientific Review Panel adjourned at 1:46 p.m.)

CERTIFICATE OF REPORTER

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

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

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 31st day of May, 2022.

James F. Peters

JAMES F. PETERS, CSR
Certified Shorthand Reporter
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