Board of Health meeting, December 14, 2021

Expert testimony delivered to the Board of Health on the discussion of draft regulation to restrict the installation of artificial turf containing PFAS in the Town of Oak Bluffs

Meegan Lancaster, Health Agent: We have a number of experts here today to talk about artificial turf and PFAS. It is important for us to gather as much information as possible as we’re looking at these draft regulations and to give some thought as to why the board may be interested in moving in the direction of creating a more restrictive regulation.

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Dr. Kyla Bennett
New England PEER’s (Public Employees for Environmental Responsibility) Director and PEER’s Director of Science Policy, Kyla previously worked at EPA Region 1 for 10 years as a wetland permit reviewer and as the Region’s Wetlands Enforcement Coordinator. Kyla first became involved with PEER in the mid-1990s, when she became a whistleblower herself. Kyla has a Ph.D. in ecology from the University of Connecticut and a law degree from Lewis and Clark Law School in Portland, Oregon. Her familiarity with science, the law, and the inner workings of state and federal governmental agencies enable her to assist public environmental employees throughout New England.

Dr. Kyla Bennett (PEER): Thank you for allowing me and the others [present] to be here today. PEER, the Ecology Center, Jeff Gearhart [and I] were the ones who discovered PFAS in artificial turf back in 2019. The people who are here before you today are not paid consultants. We're not getting paid hundreds of dollars an hour. We are not selling anything, and we do not have an ulterior motive.

We are here, volunteering our time — and you have some incredible experts like Dr. Peaslee, Kristen Mello, Courtney Carnigan — are coming before you because they care. We are here because we care about human health and the environment. We are here because we are very concerned about PFAS. We have no ax to grind, we just want to arm Martha’s Vineyard with the facts, so that you can make the correct decision for your island, your environment, and your residents.

You have been told that there are “good PFAS” and “bad PFAS” and I am here to tell you that all PFAS are persistent and that is bad. And the vast majority, if not all of the PFAS that we have toxicity information on, show that they are dangerous. The problem is this: there are now 12,039 PFAS. 12,039 and EPA just updated its website [to reflect this].

If we waited for risk assessments on each and every one of those PFAS, it would take us thousands of years. We cannot afford to do that. And just because they exist, and just because they're legal, does not mean that they are safe.

I looked at the project specifications that you had for your [project]… I'm putting my lawyer hat on now. because the scientists that are here are much better at the complex PFAS chemistry, than I am. I’m just an ecologist, I'm not a chemist or a toxicologist. But the [Martha’s Vineyard] project specs required that the artificial turf vendor certify that any PFAS listed in California as Proposition 65 or EPA’s Method 537 not be used in their product. So that's a pretty simple request, and indeed the test results showed that PFPEA was detected in the turf. That is one of the PFAS on EPA Method 537 list [and] it was found at 148 parts per trillion in the turf.
So right there, full stop, the turf that you are looking at does not comply with the project specifications, I just wanted to make that clear. And then the leaching tests that were done also found a number of other PFAS which, hopefully, someone else will talk about, including PFOA, which is notorious and very dangerous.

There's a moving target: First they said in the specs No, we cannot use any PFAS on these lists now they're trying to tell you well, it has to be over a certain level [to count] but that's not what the project specs say and that's not realistically the way you should look at it.

Just last week TURA (Toxics Use Reduction Act agency) in Massachusetts added PFAS as a class and defined them all as hazardous substances. So currently in Massachusetts, all PFAS are hazardous. Yes it's true that Massachusetts only has six that are regulated as MCLs in your drinking water, your groundwater and your soil, but they are all now considered hazardous so all of these PFAS that we're finding in the turf and the info on the shock pad should be of grave concern to Martha's Vineyard.

With regard to the moratorium: Numerous towns in Massachusetts have passed moratoriums on artificial turf. Sharon, and I see somebody from Sharon is here and I'm sure he'd be happy to share his wisdom with you about how they got it done. Sharon, Wayland, Littleton, Concord — Concord has done it twice now they've expanded it to six years. The way it works in Massachusetts is that the Attorney General has a presumption in favor of the validity of municipal bylaws so right off the bat, they presume that you're trying to do the right thing. So long as there's a discernible, legitimate purpose and there's no clear conflict with State law or the state constitution, you can pass a bylaw. So many other Massachusetts towns have been successful.

If you want to do a ban, try it. Connecticut is trying to do a ban I think it's worth it, especially now that TURA has declared all of these to be hazardous.

One thing that's different between your [draft] ban and what the other towns have done is that the other towns have limited it to land owned by the town, which is low hanging fruit. That's low hanging fruit to use the land only owned by the town, and you can consider starting there if you want to change the draft and also, you should put in a time limit: three years, five years, six years — give the science time to catch up. I know Dr. Peaslee is working on some studies, and we should know more about all the PFAS that's in artificial turf. And just so you know, Shaw Industries, which is one of the major manufacturers of artificial turf, sent us an email that said fluorinated chemistry is commonly used in turf products, and we have not yet identified a PFAS that can be substituted that's required for the use of making this. We all know it is there.

The last thing I want to tell you is that you’re being told that your bylaws should link to the State MCL. It shouldn't and here's why: PFAS are persistent, they don't break down. They are called forever chemicals for a reason, they break down extremely slowly.

I often like to make the analogy with climate change: if we stop emitting carbon dioxide into the atmosphere tomorrow, the 417 parts per million of carbon dioxide that's up there is not going to start going down, it's going to level off and it'll stay there for hundreds of years, maybe thousands before it starts going down.

PFAS is the same way: it's additive. The more you put into the environment, the more you're going to have. It doesn't go away. It stays there, it's dangerous. It’s nonsensical to say we have PFAS in our soil from the rain, or whatever, so therefore it's okay, we'll cover it up with some artificial turf, which also has PFAS, but it has less.
It doesn't work that way, because it is additive and the PFAS that leaches off of your field will get added to the PFAS that's already in your soil, already in your groundwater, [it] will get into your drinking water and will contaminate your town.

I’ve been working very closely, as a lawyer, with the State of Massachusetts [and] with EPA looking at where the regulations are headed and I can tell you this: Massachusetts is going to be regulating all PFAS as a class, so we don't have to worry about the PFAS6 or what the MCLs are. They are all going to be regulated and those levels are going to go down. California is trying to regulate PFOA in the parts per quadrillion. And it is very likely that soon we will learn that there is no acceptable safe limit of some of these PFAS.

Like lead, it should be zero, and it is just nonsensical to take a town and add PFAS to your environment when we are in this type of regulatory system where we're heading towards more regulation and much lower levels of MCLs.

I think it behooves you to go forward with this ban and I'd be happy to help you tweak your bylaw, if you want me to. Again, we charge nothing, we help municipalities. I’d be happy to do it, to try to get it past the Attorney General.

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Meegan Lancaster introduced next speaker, Dr. Graham Peaslee.

Dr. Graham Peaslee:

I’m from the University of Notre Dame. It’s a privilege to be able to talk to you and I thank you for inviting me to speak. It's always dangerous to invite an academic, I can go for three hours if you'd like. But I understand that time is precious, so I'm going to try and do this in 5-10 minutes or less. My motivation is as Kyla [Dr. Bennett] said -- Kyla gave a great introduction and she's well respected in her field, she knows exactly what she's talking about and I agree with what she says.

The reason I'm doing [this] is because this is a nationwide problem, it's not Martha's Vineyard alone, and therefore I'm trying to speak as often as I can, and I've got much the same message: PFAS are everywhere — we're getting them into our blood, every child born in this country is born with five parts per billion in their blood of recognizable PFAS and probably 10 times that of unrecognizable PFAS and one of the things my research concentrates on is how to measure all the PFAS, not just the ones that are regulated — and there are so many of them it's hard to keep up with.
So why I'm here is simply to try and counteract what you're getting [from experts] paid [by] companies [that] have a vested interest in this. My only vested interest is Martha's Vineyard — I went there in 1972 and I went with a church group and...it was great, I grew up in Brookline. [But] Martha’s Vineyard is an island economy, and you have a very precious thing called a fresh water supply, which is limited on that island.

And you know, the more PFAS you put into it, the more you will be drinking and the more that will show up in you and your children's blood. And that's a pretty horrific [thing]. PFAS is probably the largest pollution that the United States faces, [it’s a large] problem. It makes asbestos and dioxins and all the other things we've done for years pale in comparison to the cost to remove this from our system.

So the cheapest way is not to put it there in the first place.

All I'm going to do is try to address two or three of the scientific areas that we're working on. I'm not going to show any data, there's plenty of data out there if anybody's interested [and] I'd be happy to send the data and then pictures and beautiful things like that. I've got a graduate student here who would love to send you her work.

The entire class of PFAS has got a problem, it's all bio cumulative. It is all persistent and inasmuch as we can study it, it’s all toxic, it's just various levels. There's no such thing as a “good PFAS” at this point and it looks like it's getting worse.

As Kyla mentioned, the limits around the world are going down and going down significantly. The USA has yet to regulate any of the PFAS. We have health advisory limits, but we don't regulate them. All the other countries in Europe and Australia and other places have started to regulate much more tightly. [But] the U.S. will [regulate PFAS]. It looks like the EPA is going to get there in the next year, [and] then the individual states are starting to take over and Massachusetts is actually one of the leading states trying to understand this toxin.

A lot of people are making a big deal out of fact that these are polymers and polymers are safe. There's an industry standard of “beach balls” vs. “golf balls”—the beach balls are safe, because they can see them and golf balls are unsafe. Well, unfortunately all PFAS, or all the polymers which aren't — you know, you can eat a roll of teflon tape that passes through that's the argument. I wouldn't advise it but yes, you could, and most of the polymers do pass through, they can't be absorbed through your biology, however all PFAS are made in a solvent which are short chain PFAS, which all come along for the ride.

So, as you make these polymers they will come necessarily with a short chain, the PFPEA is one of the ones that will be a side product of what manufacturer of these things are but you'll also get PFBS, PFBA, and those short chain ones are there in much higher quantities than the original one which was PFOA back in 2012 before the company's voluntarily removed PFOA from the manufacturer all solvents were made out of PFOA and that's what got Dupont into trouble down in West Virginia and they poisoned the whole town.

What we've done is we've switched to smaller chain PFAS that just happened to come along for the ride with these PFAS polymers that are you using on the on the turf grass and as of a year ago, the turf grass industry was still denying any use of them. And now we actually have an industry spokesman that came on, Laura [Green], and said that they actually do use it.

So it's the first confirmation that we actually have from the industry that they are using it, and the reason they're using it is because they —this is an important point—why do they use it? It's not the primary
ingredient, and they feel like it’s unfair to be penalized for a non-primary ingredient. The primary ingredient is the blade that comes up out of the grass and they use it to extrude that from the machinery that makes the plastic plates. And as they try to get to a more permanent blade that lasts longer they have to coat it with this material or they have to redesign the machinery. And redesigning the machinery costs money and they don’t want to do that, so they are putting 2% PFAS in there and they’re allowed to add it from 20 to 2000 part per million, (it’s on the website, how much they add — you can look it up that they use it, that's how we found out they were using it). And 2000 part per million is a lot higher than anything in the part per trillion, part per quadrillion that we've talked about. I mean that's a million times higher than any … in drinking water, but of course you don't drink the turf grass directly.

So it’s a question of dilution. It's a question of weathering, all of which are unknown questions, we know that we've got spot measurements of a few parts per billion here, a few part per trillion there. We actually do total fluorine and we measure 10 times more, we measure part per million levels of these things on the blade. And it doesn't all come off, most of it stays there, which is good, however, with exposure to sunlight and water, which unfortunately turf grass field see a lot of, you will get more of that off.

Nobody knows how much will actually come off. People try to tell you it's only a few part per billion, it's going to be, by the time you dilute it, it will be safe for everybody. Well, the idea is to think of the bigger picture, where does that few part per million go eventually. If it's not an active use on the field, it will there be when they take the turf grass off and put in your compost. It'll all be there and it will all come off eventually. And so that PFAS is going to end up in the water supply of you or your children and that's why we are trying hard to get the industry to move away from it — is there an alternative that they could do PFAS-free. In the textile industries, there are, and the firefighters are moving that way.

I think you [the Board of Health] have a real role play here, in the sense of, if you take a leadership to reduce the use of this it'll be better off for all of us.

And the other question, the last thing I'll say is that they say the amount is so small it's below these limits than Mass. has six regulatory limits already. The answer is that what you're seeing is only the six that you're measuring. There are literally hundreds, if not thousands of precursor of so called PFAS out there. And we always see the MLC aspect of the instrument they use to measure these things sees about one to sometimes 10% of the total PFAS load that's there.

So you are actually dealing with a lot more than people can measure and that's what we're trying to do with turf grass, to show how much of that other PFAS load is there. We don't know what forms it’s in yet, because it's a new science, we're trying to figure out what forms they are taking but there's a lot more PFAS than they’re actually measuring.

I hope that's enough to give you a sense of why I'm concerned about it— I'm just one person, but there are plenty other scientists here that'll agree. I wish you luck in your decision. I mean there'll be a lot of activity and a lot of people interested in this and for various reasons. And I trust you guys can…if there's any information I can provide, be happy to provide you any information, to back all of this up. Thank you for the opportunity to speak.

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Dr. Courtney Carignan
Michigan State University. Dr. Carignan is an exposure scientist and environmental epidemiologist whose research helps protect reproductive and child health by investigating exposure to contaminants in food, water, consumer and personal care
products. She conducts biomonitoring and health studies for a wide range of populations, including preconception and birth cohorts as well as communities exposed to contaminated drinking water. Her research has contributed to public health interventions aimed at reducing exposures to flame retardants, perfluoroalkyl substances (PFAS), and arsenic.

**Dr. Courtney Carignan:** My name is Courtney Carignan. I'm a professor at Michigan State University and born and raised in New England. I've also been to Martha's Vineyard [back] when I was doing an internship way back when at Woods Hole and popped over for a weekend.

I’m an exposure scientist and environment epidemiologist, which means that I study how people are exposed to environmental contaminants and the effects on health, particularly with a focus on child and reproductive and immune function. I've been working a lot on flame retardants and for the past seven years have been doing a lot of work on PFAS contamination from the former military base there.

Because of all the concern about PFAS, there was a very concerned community…and because when I dove into the literature, I found some resources that indicated, *you know the jury's still out on artificial turf, [but] there are lots of concerns about artificial turf* — this was even before we knew that there was PFAS in artificial turf. And so I share those resources and I’m going to share some with Meegan as well. Like the resources from the Toxic Use Reduction Institute in Massachusetts — they have done a really nice summary of concerns about contaminants and exposures from artificial turf.

Like I said, this was even before the concerns about PFAS [in artificial turf] were known so I really thought it was a slam-dunk, like I didn't think I had to show up to all these meetings. I was very busy at the time…but I just really didn't think that it would pass and I was really surprised— I think you're all really surprised—when it did.

So it seems there are some tactics that are being used … that do sound like they're misleading, and so I wanted to show up today just to share some of these resources and my knowledge with you all, so if you have any questions about exposure toxicity, I'm happy to answer them.

Obviously the concerns about exposure and toxicity to at least the six PFAS are quite well known, and then the alternatives — we're learning more and more about them and are there are concerns about those as well.

**Board stopped to ask a few questions.**

**Tom Zinno:** Courtney, could you speak of what the toxicity that you see in people when they do get poisoned by PFAS poisoning?

**Courtney Carignan:** Yes, I can speak to that and I can speak a little bit to exposures from artificial turf. We know that the EPA has actually been doing a study for quite a few years on child exposures to contaminants and artificial turf so I'm sending a link to that as well. They have not finished that study, but I think that their study really points to the fact that there are concerns. And it's you know something to be cautious about and to be paying attention to, and I also wanted to mention before I jump into the health effects of discussion a little bit, that there's a new contaminant that's been found in crumb rubber
called [6PD quinone?] that’s been found to be toxic to certain fish so since you guys are a coastal community you might want to look into that literature, a little bit as well.

**Meegan Lancaster:** Just want to share the proposed turf installation here is that not using crumb rubber, they are using … Brock Fill. I believe it’s a tree-based infill product.

**Courtney Carignan:** In terms of PFAS toxicity, the most sensitive… so PFAS has been found to affect multiple systems in the body. Dr. Linda Birnbaum who is the former director of the National Institute of Environmental Health Sciences recently gave a talk comparing PFAS toxicity and toxicity of dioxins, which is one of the … dioxins that's been studied for several decades, and this is known to be quite toxic and she was really highlighting a lot that dioxins have been found to be toxic to multiple systems in the body. PFAS have also been found to be toxic to multiple systems of the body. Dioxins have been found to be very persistent. PFAS is also very persistent, and the list goes on. Another thing dioxins and PFAS have in common is they’re both very toxic to the immune system. The immune system is the most sensitive endpoint.

For PFAS, the second most sensitive endpoint is mammary gland toxicity, so it affects development of the mammary glands and has been implicated potentially in breast cancer and things like reduced ability to breastfeed. If anybody else here knows people who have had trouble breastfeeding, this might be possible explanation for that.

Certainly, we all know people that have had impaired immune systems, so I actually think about PFAS as an immune disrupter that when you're exposed to a pathogen so, for example, Covid-19 your body should be creating antibodies to combat that exposure and to help you get well again and it affects the adaptive immune system, so your body wouldn't produce as many antibodies because of this disruption and then also seems to enhance the body's innate immune system, so we think about the body over responding or mis-appropriately responding to self such as an auto immunities. PFAS has been implicated in potentially contributing to autoimmune diseases, for example Crohn's disease and ulcerative colitis.

There’s quite a bit of evidence … about cholesterol. In contaminated communities where the drinking water levels of PFAS are high, you actually can see a very clear dose response in terms of the association between PFAS exposure and elevated cholesterol. Of course, having high cholesterol is problematic and people want to get treated for that, but having high cholesterol can affect heart disease and other chronic health conditions that are you know quite important.

There was just a study published linking PFAS and autism. There was a systematic review that took all of the studies on reproduction and development and found strength of evidence for PFAS contributing to lower birth weights.

There have been some studies finding PFAS affects fertility, particularly male fertility. PFAS are different than other persistent organic pollutants in that it binds to protein and not fat. Sperm are pretty high in protein, so you may expect to find the concentration of PFAS in the testicles and there have been findings of decreased male fertility, in particular. There's not a lot of contradictory evidence right now in the fertility realm.

**Tom Zinno:** I have another direct question. Where does this [contamination] come from, does it come from drinking water supplies, does it come from a skin exposure? Where is the exposure that we're seeing in humans that you are able to test for.
Courtney Carignan: So the health effects literature is very extensive, particularly for the legacy PFAS like PFOA and PFOS. ATSDR has a document called The Toxicological Profiles which they have for PFOA and PFOS. It’s an 800-page document that reviews hundreds of animal and human studies …or a combination. When I’m talking about a weight of evidence or a body of evidence, I'm talking about a combination of experimental—often animal but sometimes also in vitro studies and observational human studies—we don't dose people with PFAS intentionally in our studies, So in in human studies, we have to use observational studies, so many times it's a combination so there's a combination of people that have exposures often through drinking water, some are occupational exposures, which can be through different exposure pathways: ingestion, inhalation, dermal.

There are lots of studies now in the general population, so we see effects in the general population exposure levels. And then you know, like I said the animal studies so it's a combination of studies, there are many, many, many studies.

Tom Zinno asked if the measurable studies show contamination is from exposure through the skin, drinking water or the air we breathe and referenced communities where a large number of residents have higher cancer rates because of pollution problems in the water.

Courtney Carignan: The easiest way to study is usually through ingestion so most of the studies do look at ingestion pathways, however, if you think about ingestion it's a less toxic pathway, because it would go usually from it would be absorbed through the gut and then pass through the liver and then into the bloodstream whereas something like dermal exposure, which is much harder to assess, will go straight to the bloodstream and inhalation again will go into the lung and then straight into the bloodstream so no passing through the liver, first of all that, for PFAS it might not matter that much because they are so persistent. So you know, even though most of the exposures are through ingestion you know it wouldn't expect the toxicity to be lower through the other exposure pathways.

Tom Zinno (BOH member): Yes. I have multiple more questions… Firefighters are concerned with the equipment that they wear that is coated with PFAS…it seems that the PFAS that are used for firefighting foam is like a drip directly pouring it into the groundwater and it heads right down to the groundwater. It's showing up in (two) wells already in West Tisbury. In Oak Bluffs they are assuming the PFAS is coming from firefighting foam. So my question is [also more] broad, but thank you for your answer so far.

James Butterick (BOH member): As a retired physician, I am very much aware of how long it took for the medical community, and then the political apparatus in our country, to appreciate the burden of illness that cigarette smoking placed on our patients and now, as an anesthesiologist, I did participate in lots of medical care that involved the side effects of cigarette smoking. It [wasn’t until the] 1960s that we could publicly say “Smoking is really bad for you,” and continues to be a problem in our country. I look at this and the PFAS problem in kind of a parallel way -- the testing is embryonic in some ways, the number of substances is huge, and it's going to be growing in severity. I'm not against a bright green field but I'm against one that's got PFAS in it. Is it possible to build an artificial turf field without PFAS in it?

I’ve read things from these people as well, but in the Horsley Witten report it says there will not be PFAS, but there is.

Dr. Graham Peaslee: I can answer that one, it's an excellent question. I think that it is possible to do so, and [while] I'm not an expert on artificial turf, I [do] know why [PFAS is] being used. It's being used as an as an extrusion agent and it's being used as a finishing agent — to make the leaf not buckle and not wear easily. They used to make [non-PFAS] before they had this, it just wasn't as good as turf because
it didn't last as long. It didn't perform as real grass does and they added crumb rubber and now this Brock Fill and other things to simulate some of the effects, and so they're evolving… this is a miracle chemical – it’s a very good surfactant. [But] it’s being used preferentially.

I think there's a real need to invent some green chemistry, to come up with a field that could be made [but] then you'd still have arguments about whether you want that. I work at Notre Dame and the natural grass advocates vs. the synthetic turf advocates] go way beyond any science — it’s a passion at that level, and so I don't want to get into that, but I think that there is, if you can put pressure to try and say: We would accept this if it was PFAS-free, then somebody would actually go ahead and invent one. It will cost money and it will cost manufacturers more to make higher temperature extremes that won't need PFAS added as 2%.

Those types of things need to be done, but nobody's going to do it if [communities] keep on buying the fields. And that's why I think that you have a role as a community to say look: We would consider this if it were not for this chemical [that] comes along for free.

It’s not their intention to put this stuff in there, they don't want to pollute you guys, because nobody wants to do that. It’s just nobody told them about it, they weren't involved in the way upstream and the way this thing was manufactured, they were just told Everybody is using this, you should use it to get the blade to look smooth and last longer — which are good properties if you're trying to sell a turf grass field. I believe it's possible to do [and] somebody will do it, I just don't think there's any hurry to do it.

[As for] the firefighting gear, I was the author of the study that shed light that the PFAS is coming from the gear that firefighters wear. And I was told at the time, very clearly by everybody ‘Oh, we don't use [PFAS]’ and then ‘Oh, if we do use it it's safe’ and ‘It doesn't go through the skin and firefighters, of course, never sweat.’ …But as soon as the paper came out and it was validated by peer review study, all of a sudden the union got involved and voted a resolution and within a week of that resolution passing, all three remaining manufacturers all volunteered to make PFAS-free outerwear, which was pretty remarkable. I'd never seen anything quite like it, but it's the power of a bunch of voices getting to them and saying, How come you lied to us about this? and they got mad. That's why I’m doing this, I'm hoping that you will have the wherewithal to say, 'Look we're not against artificial turf in of itself, we're against the PFAS coming along for the free ride.'

And they know it's there, they will argue about how toxic it is or how much is there and how much comes off — that's all going to be in the details. I'm concerned it’s there and high, but I think it's a great opportunity to go back to manufacturers and say look, We'd consider it if you could make a PFAS-free. Who's going to be the first manufacturer to do that and that's where the business enterprise can try to strive to make something a green product that would be great.

Tom Zinno said it sounds like a manufacturing issue, nothing has changed in how it's manufactured. It seems like [turf industry] needs some motivation to produce something PFAS-free.

Joe Sullivan: I can respect everything that is being discussed and I’m trying to be open minded to the aspect of what you're trying to do and putting information out there. I think diplomatically, it would have been helpful in the long run to not only hear some of the opposition against the direction and decisions that you're looking to make but also hear from the applicant that's actually doing the particular installation and have a potential voice and discussion of the immediate matters you’re discussing with some of your professionals.

I don't think it's a fair process, just to bring the people who may be against that particular product or the information and science behind it, without allowing the applicant to provide meaning.
William White: They're here and we're going to hear them so it's not a one-sided dialogue or one-sided conversation. The board members, myself included, want to hear everybody and that's why we're doing it so because they didn't come up first that doesn't necessarily mean that we're not going to listen.

Joe Sullivan: Listen, and I don't disagree with you, I just wanted to make sure that you know you the notification mission and I'm not saying that it wasn't probably advertised appropriately, but I wasn't under the understanding this meeting was going to have this level of conversation. I was unaware that the level of presentation of this nature was going to occur today, and if that was the case, I would have been able to have other presenters here, to be able to correlate that with you.

William White: Again it's a dialogue, right now, the board members are just listening. There is no vote, we just want to hear, so no.

Tom Zinno: I'm going to echo what [White] just said, we're still gathering lots of information, you know, this is not happening tomorrow. We find anything here we're just having all right we're continuing the discussion, and we want as much information and we would appreciate getting it in if anybody has besides this dialogue here, put it in writing, your concerns, your evidence, to be able to do it and send it to the board in letters, so that we could all read it in digest it also.

Joe Sullivan: So my question is will there be a follow up hearing? I mean, obviously, you know I'm hearing a lot of this, you know discussion, for the first time I would want obviously Our group to be able to at least you know be prepared to speak in front of you as well, and I don't think I have that opportunity if they weren't aware of what was going on today that's all.

William White: Right well there's going to be your follow up just again to the opening of the dialogue and whenever it just wasn't going to be one of the things we're going to do today that's what we say again we're listening we're taking information and the more information as far as I'm concerned, I'm quite sure the other commissions feel the same way, the better so that's where we're at right now and again it's an open dialogue.

Paul Lauenstein: My name is Paul Lauenstein and I live in Sharon, Massachusetts. We passed a three-year moratorium on artificial turf and in response to that we have a problem, presumably Martha's Vineyard, similar to yours, that we don't have enough athletic fields, we don't have enough hours to accommodate our sports programs, so we decided to embark on a program of enhanced natural turf maintenance, to try to get more hours out of each field.

We’ve done a couple of creative things like sand injection to increase the drainability of the fields, so we aren't faced with three or four days delay of mud after a heavy rain storm and we can't play on the fields and that's done remarkably well to drain the fields. We also have started with dormant seeding in the winter, so that the grass comes up stronger in the spring. And some other things too — We hired a professional consultant, and before we started on this, we asked the question, Are the ingredients of enhanced turf maintenance any less objectionable than PFAS? So we got a list of all the things they use and we gave them to a toxicologist who said they weren't bad so I just wanted to share that experience.

I'm responding to Dr. Butterick’s comment about alternatives to artificial turf and we are working on getting more hours out of the limited number of fields that we have, through enhanced turf maintenance. Thank you very much.

Board of Health member William White asked if Mr. Lauenstein could forward to them the information based on the toxicology of the alternative. Member Tom Zinno asked that any objections or any
information to please present it in writing along with documentation and your concerns. It would be very helpful to the board.

Meegan Lancaster said that Kristen Mello had some slides she'd like to share with the board.

**KRISTEN MELLO** (she/her) has a Bachelors degree in Chemistry (UMass Amherst), and a Masters degree in Analytical Chemistry specializing in Chemometrics (University of Delaware). She is the Director of Westfield Residents Advocating For Themselves (WRAFT), a community group formed in response to the PFAS contamination of their drinking water. Kristen led the effort to get PFAS blood testing for Westfield residents in the form of a PFAS Exposure Assessment from the Agency for Toxic Substances and Disease Registry (ATSDR). She was one of only two Community Representatives invited to be on the MassDEP PFAS Maximum Contaminant Level Stakeholder Group, is a Community Member of the Barnes Air National Guard Base Restoration Advisory Board, and works directly with UMass Amherst researchers on the Mass PFAS-Cov Study. Her PFAS advocacy work, in large part, led to her being elected a Westfield City Councilor At Large in 2019 and 2021.

Kristen Mello: My name is Kristen Mello and I am from Westfield, Massachusetts. Technically speaking, I was educated as a chemist I have a BS in chemistry from UMass Amherst and my master's is in analytical chemistry from the University of Delaware where my specialty chemometrics which is where chemists use a bunch of math and computer science and a little bit of artificial intelligence in order to investigate relationships and data, so we're like super geeky chemists people.

But what I wanted to show you (is at right). Eleven days ago, New Hampshire DES put out a paper. They went to Sagamore Creek and took water samples, and they took them in three places (yellow dots):

1. Top right, Portsmouth athletic field installation (WSHEDTB1), a sampling point at the Sagamore Creek just downfield from the field.
2. Left side, another sample where Greenleaf Ave meets the creek (WSHEDTB2) and
3. Down at the bottom where Elwind Road met the creek (WSHEDTB3

So they have three sampling locations and New Hampshire has included in the report a whole explanation of how far up they went so that there would be the least amount ofTitle influence in their sample.

These are the Sagamore Creek results (see next page)…
The blue is from next to the field. While the information from New Hampshire explains that because these numbers are lower than their water standards and because they all have the same suite of PFAS chemicals, they assume that this is background, but what's important to note is that the Blue is so much higher.

When you add up all the PFAS, the one by the high school is twice as high, [and] while these do not hit a level in New Hampshire [that requires] them to take action, it is worrying to see it. If the creek were equally contaminated, they should be relatively the same or close to the same but they're not.

William White: What's the threshold for New Hampshire to take action, 50%?

Kristen Mello: It's 12 for one chemical and 14 for the other but technically speaking, they don't actually have groundwater quality standards so much as drinking water quality standards, so if there's no well, they may not have to take action at all.

So I said, well, How does it compare to Massachusetts standards? What if that creek were in your island. What would it look like? And so, when you look at that data to get to Massachusetts standards you can't include what they call a J value. A J value is a number that is above the instrument’s method detection limit but it's below the reporting limit so it's a number that's a little bit lower than the standards. You made your calibration curve with and so it's an estimate, and when you have those estimates in Massachusetts you can't use them to add up to a regulatory limit. So those numbers aren't included here, we only included the non-J values and the non-J value for that water in Massachusetts would trigger action.

And that's my take home message for you right now.

So what do the Massachusetts results look like? You [the MVC process] did all of this testing, what does it look like, for you? Well, when you just did the leachate analysis (MVC REPORT REFERENCE?), you took the stuff and you let it sit in the water to say … what would storm water take off these materials, [and] this is what it came up with, and your concentration here is in parts per trillion and you
have the Greenfield turf and the shock pad and the Brock Fill. And so, these numbers aren't particularly high, but these are also brand new and they haven't been sitting out and they haven't been weathered.

And in another document that I sent both Portsmouth, New Hampshire and to Meegan last week in April of 2021 there was a review of the polymers that are used to coat these materials and, in addition to having strong oxidizing agents like chemicals and ozone, you know perchlorate those kinds of oxidizes interact badly with them, they also start to break apart under UV radiation. Not so much at 40 hours but above 120 hours if they severely fracture, and so we don't yet know what happens when those compounds begin to fracture and come up in the water. But when you look at water samples from other places that have had field installations and they are much higher than everywhere else in the creek it is concerning and a reason for alarm.

You also had one more test that was of note, MV Turf Total Oxidizable Precursor Assay (at right). An oxidizer precursor assay is when we take and oxidize all these PFAS that we're not seeing and our standard 537 and they convert from these tiny little bits into PFCAs that we can read and we can see. When you did that in your test (REFERENCE WHICH TEST?) you got significant results, and this isn't in parts per trillion — this particular graph is in parts per billion. Just from a data analysis point of view, you already have enough information to know that this installation is going to affect your groundwater and your honest sole source aquifer.

There is no plan B for you. There's no plan B.

And so, while you already have PFAS going into your system from septic tanks and landfills and you know all of the other [uncontrollable] ways we get PFAS in our lives, this is one of the ways you can control. A conscious decision about putting something this large that has the capacity to put this much PFAS in is a serious choice that you're making not only for yourself but for every generation of islander coming after you. [Martha’s Vineyard] is a sand bar. You are a sand bar and your drinking water comes from the rain. Every drop of PFAS that you add to that island is yours to keep and to go through your generations of people.

I thank you so much for taking the time to speak with everyone, especially those people who are donating their time to you and not paid consultants. We're not trying to sell you anything, in fact our stories make life more complicated, we know we're not super popular, but there's a better way and there's a way to protect the health of generations to come and I hope you choose it.

I’m happy to answer any questions. I will write all this that I gave you, and if you need anything, please let me know.
William White: I have a question. Does New Hampshire have any mitigation procedures to mitigate PFAS, or was there anything in or was it just the field. Do they have any filtering system or anything else, like that?

Kristen Mello: Well, they did do extensive storm water work there, but storm water work doesn't clean PFAS. To my knowledge, there's no storm water PFAS filtration that's up and available yet.

Tom Zinno: Is there more data from groundwater testing under existing fields or is that kind of non-existent? To be able to see the data of fields that have been out there for a while that have lived in the weather in the shock of people playing sports on it, is there data out there?

Kristen Mello: Well, I think a lot of the turf data is over in Dr. Peaslee's lab and I would very much like to take [him] up on his invitation to take a look at it. But I will tell you all weekend we've been comparing different sites, we knew in Massachusetts and groundwater samples from them in several areas. You could see where in Franklin the turf that had all been rolled up there was that Boston Globe story. The runoff coming right after that was really, really high in the six 2FPS that's a PFAS that's a precursor. And it turns out that when that hangs out in the environment, it gets oxidized by microbes and sunshine and other things, whatever into the PSHA checks, and the PFTPA. Right, so if you start watching the 62SFS migrate into the environment you'll start to see it show up as these other PFAS. It will get bio transformed so and also there was one near the McDuffy school in Granby, Massachusetts their school’s wells have just started to show in a very small levels and their installation was recent but getting correlative information of monitoring wells that's work ahead.

Graham Peaslee: I can add to that…Kristen has done a marvelous job at the data, I have not seen what she showed today... But I know of two other places that have some correlation with the surface water, where there's run off of a used field.

We've looked at dozens and dozens of fields now and we can measure this turf and we see high levels, part per million levels of fluorine. But when we look at the individual PFAS you see low levels part per trillion washing off and the question is what happens over time? And what Kristen just showed was what's called a total oxidizable precursor assay, so that scale went up by a million fold. The parts per billion coming out instead of way down lower. It went up at least a thousand fold, but maybe even higher. And that’s the cumulative amount that can come out over time readily. There's still plenty left … and to do the study in the groundwater would really take the drill wells and pump water into test. It just requires a budget that none of us has that we're going to be able to do that.

So nobody's done that study [but] I would love to. [A lot] of people would love to do that study but it's going to take time to get to that. Groundwater, of course, can have hundreds of years to fill up. If you look at Massachusetts they have a more direct posts they put a triple F on this … is now getting into the groundwater that people are drinking on Cape Cod and that groundwater there has lifetimes and hundreds of years to go from point A to point B.

I think what we put on the surface water is what we can measure going into the groundwater it's going to take years to be able to see it, but what you've done today will show up there and 500 years and we'll be able to see it.

Christian Huntress: Thanks for having us and just to answer a couple of questions that were raised. You had asked whether or not there were groundwater studies that have been done. There is one that was done by Haley and Aldrich, it was done on the Lexington and Concord fields and was submitted as part of the MVC review. There is some data in that I'd be happy to get over to Lorna so that you can see that and determine whether or not that had value in your decision.
The other thing I'd like to add, is just two quick comments, there was a comment from a presenter earlier that the synthetic turf would lay on top of the topsoil and would be additive, it whatever PFAS was in the turf would be added to the top soil. That's not how synthetic turf fields are installed. The topsoil is removed, and then the synthetic turf is placed on top of a gravel-branded blanket that goes into an infiltration system. So it's not added if you don't take … whatever you find in this turf and add it to the top of the top. So really just a note for everybody, so that we're dealing with the same information and then, finally, a question back to Kristen. Kristen, you showed those target readings out of Sagamore creek… was there a target reading prior to the installation of this synthetic turf field, so that you could see whether or not there was an impact of background readings on any of that data or is it just speculation.

**Kristen Mello:** I have no background reading for PFAS in the Sagamore creek previous to these readings.

**Christian Huntress:** So you don't know what the levels were like prior to the installation of the synthetic turf.

**Kristen Mello:** There may be people who do, but I do not have that data.

**Graham Peaslee:** We do have pre- and post- [data] on a field in Fairfield, Connecticut, so we do have data that shows that increases about the same level of person sees about a factor to hire.

**Joe Sullivan:** Just wanted to add, I mean I think it's important to have you know that testing, and we in part of the proposal is to have testing wells put in to our location having a baseline to start with, and then previous readings, but even the studies that you know a lot of the experts are inquiring about its I want to make sure that you know the studies being done is on apples to apples and not necessarily I mean those fields, full of crumb rubber that would expedite the levels of PFAS based on the fabrication of that material, so I think it's all relevant. I think it's important to have these studies. I couldn't commend you know the you know our world now for going that route, but I also want to make sure that you know we're comparing apples to apples and not apples to oranges, when it comes to what we're looking at for overall results, thank you, but that's a great point.

**Meegan Lancaster:** Joe, to your point on the numbers that Kristen showed in that chart with the PFAS leachate chart — those were directly from the Alpha Analytical studies that were commissioned for this project and the commentary that Dr. Bennett made in terms of the requirements for the California Prop 65 and the EPA I believe it's 357, were also taken directly from the work that was done to this specific project, so we were sure to reference this project, specifically for those items.

**James Butterick:** The question that comes to my mind, and I know it's been referenced in the literature in the studies that we've seen is okay, so if this ends up going forward, as is and we test on an annual basis and in two or three years there's excessive levels of PFAS that are coming out of what then? What are we going to do, are we going to tear out the field go back to grass? And what happens in this is a huge investment. And it just seems like it'd be better to do something without PFAS so there's not an issue, because I think we have to anticipate that testing becoming more sophisticated and more of these PFAS chemicals being identified and regarded as toxic were we got it, we could have a very serious problem 2, 3, 4 years out and what will we do.

**Meegan Lancaster** went over the Draft Regulation and walked attendees through it.
**Meegan Lancaster:** Our regulations for a while now, just to make sure that they're consistent from regulations as we've been going through and creating new ones and amending old ones so the scope of authority is this is the power granted to the Board of Health under Massachusetts federal law which allows Massachusetts boards of health, to adopt regulations and it's also referencing the nuisance statute in M.G.L. which refers to if the board feels that something may cause harm.

So the purpose is, whereas the siting of artificial turf has the potential to release PFAS and metals in drinking water supplies…one thing that we've been focusing this conversation entirely on PFAS, but there are, based on the studies that were done for these particular products leachate of heavy metals as well. And these pollutants have repeatedly threatened surface and groundwater quality. Surface and groundwater resources contribute to Oak Bluffs public drinking water supplies…the town of Oak Bluffs adapts the following regulation under its authorities specified in section one which is referring to the State law that allows us to create regulations.

As a preventative measure, the purpose of preserving and protecting the quality of public drinking water drawn from our sole source aquifer and to minimize the rest of public health and the environment. And, as was discussed with other towns, who have done the moratorium, those were also done I believe, through select boards [but] we do have a right as a board of health, to create regulation, though, so be mindful of that.

This regulation shall apply to all property in Oak Bluffs so this would be public and or private. When going through definitions, the one thing I think, maybe somebody can speak to this, as this definition of PFAS-free, which in my conversation with Dr. Bennett and it also spoke with Jeff Gearhart from the Ecology Center that this is the generally accepted definition for defining something as PFAS-free.

From the numbers that were pulled from the testing that was done for the specific products that are proposed for this field, they had a combined level of 117 parts per million. So the prohibition would be the installation, storage and dumping of artificial turf containing PFAS in the town of Oak Bluffs. The effective date would be whenever the Board votes the regulation in, this is just important to know as of the effective date there's a common missing here as of the effective date any applicable modification of a property within the town of Oak Bluffs shall comply with the provisions of this regulation so it's not written particularly clearly this is not saying that if it's in the ground at the moment that it would be to be removed, but going forward, there would not be allowed any modification, that would be contrary to propose draft regulation. Then this is the language that's included in Mass. General law for penalties for violation of regulations. And also just the severability clause that affects all regulations that we do, and then the effective date for the proposed regulations.

I know people have been saying ‘moratorium’ which you know if that's something the Board is amenable to, then you know we're welcome to modify this it is you know it is a draft, I think we all know that the science is evolving quickly and we have the opportunity to amend the document as the board would see fit.

Additionally, I just want to include…so the state of Massachusetts only requires public hearing for regulations that deal with Title Five, which is the septic regulations, they don't require public hearings for any non Title Five regulation so this would be a non title five Regulation, However, we have always historically published in the newspaper and how the full public hearing in the interest of hearing from people and transparency. So while not required by State law to hold a public hearing for a future vote that's what we do for our regulations, all of them, just to make sure that we're consistent across the board.
Dr. Kyla Bennett, Public Employees for Environmental Responsibility: I would suggest adding some language in there about the fact that you are on a sole source aquifer because that is different than many of the other towns in Massachusetts. And I would also add something about the micro plastics, and I think Paul might still be here, but the town of Sharon talked about that because, contrary to what you've been told, these blades do break. We have videos we'd be happy to share with you, showing how they break off and get into the water, and that is an emerging concern. In fact, the state of Hawaii just added micro plastics to one of their water quality standards, so I think that's another valid concern for these fields, so those are two suggestions that I would recommend.

Meegan Lancaster: I believe I have the language about the sole source aquifer in there, I did run through it pretty quickly, though, but then just to one point which I'm sure Chris or Joe would bring up the proposed plan does have a in the catchment system under the field for storm water drainage they do have a geotextile to I can't remember down to what size and sure Joe or Chris can chime in on that, but in order to filter micro plastics, at least from what might go through the field directly into the stormwater system.

Dr. Bennett, Public Employees for Environmental Responsibility: Part of the problem, though, and if you look at the life cycle and that's something that we haven't really discussed here today, but if you look at the life cycle of these turf fields… I know everyone's talking about this new proposed recycling facility in Pennsylvania, which I will believe it when I see it, we've been hearing about this for a decade or more, but the bottom line is that when you have a PFAS-contaminated item like whether it's the micro plastics from the blades. Those themselves will become hazardous waste, so you have to figure out where to dispose them. You can't put them into a landfill, you can't incinerate them. As you all, probably know, EPA had a $50,000 award for anybody who could develop a method to destroy PFAS and we really don't have very good ways right now. If you incinerate it the PFAS can become airborne and travel hundred and 50 kilometers if you put it in a landfill it leaches out and gets into the groundwater There's really nothing to do with it, except at this point store it so. And whether it is going to stay on island or go off island if it goes off island you're just contaminating somebody else.

Think about that as well when you're thinking about the plastics that are coming off this, even if you're collecting them and preventing them from getting into your water, what do you do with them, then.

Meegan Lancaster: Thank you, and when I was speaking with somebody the other day, talking about Mass has some pretty restrictive landfill solid waste practices and that currently there ignore the fact that it's an island and there's a ferry in between us and the mainland, that the cost is approximately $900 a ton to dispose of hazardous waste materials and it needs to get shipped to Michigan currently.

Kristen Mello: Thank you, I just wanted to add I don't know if on island you guys, are the ones responsible for landfills, but out here, health and landfill tend to go together. And I just wanted to make sure that, as you think about this, you also provide some kind of mechanism or framework for your businesses that need to phase out of… maybe it's a CAFE with a little bit on the ground, or maybe, is it a hotel or someone who's got this fill already and the kind of turf and needs to be able to dispose of it if you'll take the time to find out exactly how so that anybody who is looking to get away from artificial turf knows the appropriate way to do that on island, I think it would help everybody there to sort of comply and move forward with you.

Meegan Lancaster: Thanks we don't have any active landfills they've actually all been shut down and kept on the islands, so we transfer all of our waste off island currently.
Kristen Mello: I'm so sorry that I mean it's great that you don't have it there, but that's a huge expense, so if you, am I, there may be there may be options with DDP and the state or even federally to help remove PFAS.

Tom Zinno: This has really opened my eyes to the amount of plastics, we have in our lives … plastic everywhere we touch everything we touch it's everywhere, you know I think this PFAS problem is you know, as we're talking it's in our foods it's you know it's somewhere in our waters on miniscule levels, but we have you know we passed a plastic bottle ban recently, you know you go fishing and there's plastics in the water it's everywhere, you know we've created a society where we do we're going to be dealing with PFAS for a while. So, you know that this is something that's involving the testing is involving the government regulations is evolving so it's something that is constantly changing, and I think we're just unfortunate that this feels here at this point in time. Because I think the regulations are going to be more strict and every year they're going to be coming up with more because they're going to be finding more data on how the plastics we've been using since the 40s or 50s when Dupont you know started introducing them and Dow Chemical in our lives there. You know we're going to find out more data, and I think it's changing right now so I'm glad we're looking at this closely because I'm really shocked, because I wasn't looking at it before this and this to see how much of it is constantly around us surrounding us.

William White: Thank you, Tom as far as I'm concerned the board members ourselves we're going to be taking a look at the draft and taking all the information that we get over the next couple of weeks or months, however long it takes and then we'll at some point in time will come to a conclusion, if we want to enact these on that, but again, it is a draft to be changed, modified or you know, taking out all the ways when that choice this moment in time, but it's an open ended dialogue it's an open ended conversation I would like to thank everybody for giving the particular perspective it's helped me as a coach wouldn't help the island.

Meegan Lancaster: The word moratorium was bandied about versus you know spot out prohibition is that something in terms of you know, this is part of a discussion that the board would be interested in proceeding in that way? It could be a regulation that is the moratorium and in lieu of a full restriction on the installation, that it would be. The thing is, if you if you pass the regulation, you can always repeal the regulation at a later point and if any product in the future, meets the criteria of PFA-free that, of course, then that would be you know permissible so that's I think one thought to keep in mind right now and then the other one is this definition of PFAS-free. I’d be curious, and I can you know speak with some of the experts here offline but this is the generally accepted threshold for defining something as PFAS-free.

William White: Right at this moment I'm going to take the information and I'm just going to hold up and digest all this information.

Meegan Lancaster: So you would like to accept public commentary… I did receive a couple of pieces of correspondence on that one of them is from Chris Huntress talking about the DEP criteria for detection of PFAS in the soil and groundwater. I emailed this to the board I got it yesterday afternoon. I'm talking about the relative thresholds, and these are the thresholds that they had talked about, which is the mass contingency plan it's MCP on refer to the PFAS six compounds and the MCP is reporting limit where enough has been released that there's a reportable quantity, so that was what Chris was asking about was pegging our regulation essentially to the reported concentrations in the synthetic Mass DEP criteria for detection of PFAS in soil and groundwater so there's that I also received letters from the NAACP, Chris Romans, Susan Desmarais, Elizabeth Drops, Noli Taylor, Barbara Casso, Field Fund, Beka ElDeiry, support of the draft and one letter from John Packer who was not in support of the proposed regulation.
James Butterick: They're just some things that we're going to have to consider, I mean when I read the first time and it says all land in Oak Bluffs and it's like well, you know private land that it's a stretch on the other hand, public land is something that we know we're probably going to consider whether it's a moratorium or regulation. And if we wanted to put a time frame and just things that we haven't thought about, we need to discuss, and we will.

Tom Zinno: What I've read, is that there are other towns in Massachusetts have proposed moratoriums or have passed moratoriums to put off the installation while things are evolving. And I think I've also read that you know it's an issue, even out in the Midwest-- places where there have been droughts, where they've been using a lot of artificial turf in different areas, you know in people's yards to save water and now this issue is also coming up, but the moratorium issue, I think the other towns have done in Massachusetts and in New Hampshire or they're proposed to basically, say, you know waiting for the science to get to the place of acceptance or you know that we find out that what the regulations really are some theory involved so that's that is a tool that is not a regulation or if it can be folded into a regulation, if we go that way we don't know yet.

Joe Sullivan: I just wanted to make two points, I just wanted to see -- you will be having another hearing and will be, I mean as the actual group we will be notified of that hearing and what will be discussed at us, so that if there's any additional information or documentation that you're looking for, we can have it ready.

Meegan Lancaster: What would the board like -- to have a follow up meeting to have a further discussion and then have another meeting, which would be the official public hearing or what How would you like to proceed here.

William White: Well, for me, I don't know about the other two [board members], for me, I'd like to have another meeting to address some of the other issues with anybody or Joe says he'd like to present some information. I'd like to hear what he has to say or anybody else, and take it from there. I know that situation like this, where we were listening to people and then take it again and then take it again I don't know it's a time thing you know we do a rush I don't think so, you know my thing would be to gather as much information as I possibly can.

Joe Sullivan: And the other, the second part of it is just you know you put a moratorium a stipulation on justice as...

William White: Well as looking betting on when putting it on at the moment.

Joe Sullivan: No, no, I mean you propose a draft of that but okay i'd also make sure that you take in consideration PFAS, you know that the conditions of PFAS exists even in our soils as we speak, right now, so you know it's a consideration on a particular material that you're speaking about but it's a bigger animal than that and if that's the case, I mean, I think you need to really think through how you're presenting it, and what you're presenting on because I mean as Tom alluded to earlier, it's like it made him think outside of the box. It is a lot more involved than just the turf field that you have concerns about, that's all i'm trying to say.

Tom Zinno: With the okay yeah I agree, I think it's a much broader issue there's PFAS that we need to consider this is a regulation if we do, do something like this it may have to be broader because I think that the problem is broader. And yes, I think the meeting schedules will be you know get as much information before we actually move forward on doing anything and if it's multiple meetings it's multiple meetings, it's education, it's finding the right path to be able to come to a conclusion that is good for everyone and keeps our water safe.
Christian Huntress: Thank you very much for this conversation I think it's incredibly valuable and it's a great thing to continue to have this discussion about our environment. One of the things that I just wanted to point out, as a designer of the field we took the responsibility of specifying products very seriously. And the products that we specified are different than a lot of products that are used around the country and a lot of products that were referenced today, so I'd encourage you to look at that and Meegan did a good job of kind of paraphrasing my email to the board yesterday. But the part that was left out is significant in that I copied the Tetra Tech report that was done as part of the MVC hearing and that report was a third party independent report, it was not somebody hired or engaged as part of our team, it was a consultant team that was hired by the MVC and Ron Myrick was the principal in charge a Tetra Tech who oversaw the testing of the materials that we propose.

As I've said, you know, often through the MVC process, if you can turn about what is going to happen in the ground and test the products before you put them in. The products that we specified have been significantly reviewed and done so independently, so I would encourage you to reach out to Ron Myrick and talk to him. I would encourage you to invite him to one of these meetings and talk about the results, because I think you would find it interesting. You can get his information from Adam Turner over at the MVC. Again, it's not somebody that was part of our team, but I think that makes them even more valuable to speak to you guys as to what a true independent voice has said about the testing and the products that we propose, so thank you very much for your time.

William White: I'd like to do that, Meegan, could you reach out to him for our next meeting is the board in agreement with that?

Kristen Mello: Thank you so much, I just wanted to add that the Martha's Vineyard charts that you saw those are from in fact that Tetra Tech report and the assumption that the field would add 12 parts per trillion to the groundwater that's from the Tetra Tech report. In my write up, I will make sure to highlight those for you and take screenshots.

*The Board of Health set January 11, 2022 for a continuation of this discussion.*