

**WHITMAN COUNTY
PLANNING COMMISSION
MAY 1, 2019
WORKSHOP
MINUTES**

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Gary Moore – Member

Guy Williams – Member
Keith Paulson – Member
Russell Jamison – Member

STAFF:

Alan Thomson – County Planner
Katrin Kunz – Assistant County Planner
Ginny Rumiser – Clerk

7:11 p.m. – Mark Storey – I just wanted to say that the speakers are breaking up back there and no one in the back can hear, so I'm just saying that we need to speak up into the microphones.

Chad Whetzel – Okay, thanks. So tonight we have several professors from WSU that are going to speak to the Board, to hopefully enlighten us on some of the issues or known issues of marijuana growing in the county. Can I have the professors please state your names and I will have you come forward in the order listed, so that I can keep track.

Tom Jobson, John Wyrick, Jon Davis, Ryan McLaughlin, David Gang, Mark Lange, and Michael Kahn.

Chad Whetzel – Is that all of the professors that are here tonight? Okay. I understand that we have an attorney, John Ashby, are you present tonight? Not hearing from him, I will proceed.

So tonight, what we are going to do is, we'll get through some of the testimony from these professors. I would like to have them have a conversation with the Board and if the audience has questions, at the end we'll try to go through those. But, again most of this is, we're trying to get some information so we have some idea as to where we're going. And at the end, if the rest of the public has questions, you can address those to the Board. We're going to put a 3-minute time limit on that, just to try to keep things condensed down tonight. If for some reason you have more questions, feel free to

email the County Planner, Alan Thomson, or the Assistant County Planner, Katrin Kunz, and they will get those to us.

Stephanie Fosback – If I may ask the professors if they have any conflicts of interest to disclose.

Chad Whetzel – We will discuss that at the beginning

Stephanie Fosback – If we can have them lay that out frankly, so we know where peoples research funding may come from, any industries that may provide a conflict of interest.

Chad Whetzel – If I can get into this before they speak, if all the professor's, for the recording, state your name and what you're affiliated with and if there may or may not be any conflicts of interest. Also when you're, and I'm sure you guys know this way better than I do, if you're giving testimony on something, especially if there is a paper cited, please give that so that we can look that up later on, if we need to. If there are any questions about it, I would appreciate that greatly. Are there any other questions before we get going on the testimony?

Guy Williams – I think we had a couple late comers.

Alan Thomson – Yeah, I think we may have somebody who is on the list just show up.

Chad Whetzel – For those gentlemen who just showed up, I was trying to get a list of names, are any one of you one of the professors or the lawyer that is going to speak tonight?

Josh Ashby – I've worked with various license holders. Alan had reached out to me and asked if I could show up to night and answer some questions.

Chad Whetzel – Okay, we'll probably get to you after we go through the research stuff. Was there another professor that may have come in? No? Okay. Tom Jobson, do you mind going first?

Tom Jobson – I can go first.

Mark Storey – Do you want them at the podium or just to hold the microphone?

Chad Whetzel – Wherever they are most comfortable. I don't know if we have a microphone set up at the podium that would be the easiest.

Ginny Rumiser – We can set a microphone up. They just need to speak loudly and have the microphone close to their mouths.

Tom Jobson – Is that loudly enough.

Ginny Rumiser – I can hear him, but I don't know if the audience can hear him.

Tom Jobson – Is that loud enough.

Mark Storey – We don't have a very good microphone system here.

Tom Jobson – I'm a professor in the Civil & Environmental Engineering, Laboratory for Atmospheric Research at WSU. And my expertise is in trace gas analysis and air quality. Mr. Thomson asked that I come down and talk about, presumably my experience with the Spokane Clean Air Agency and doing the air sampling for them regarding marijuana grow operations in Spokane. So, I'm going to talk about that. So, Spokane has a large number of growing operations and the Spokane Clean Air Agency has been inundated with odor complaints. So, they put together a little air sampling operation of the growing facilities to find out what the growing facilities might be emitting that would be causing odor complaints in Spokane. So, we were asked to collect air samples, actually they collected the air samples and we analyzed them. So, we produced some data for them to help them evaluate what these operations are emitting and whether these odor complaints are justified. They were wondering if there was an issue with just a NIMBY kind of thing, like people just didn't want these facilities near them. We measured different growing operations and in different places in the facilities, primarily grow rooms. And we identified the types of mono-terpenes that are emitted by some varieties. What we found was Myrcene was the most abundant things emitted by these plants, followed by Limonene and Alpha and Beta Pinene, some varieties were big emitters of Terpene. So, all those are mono-terpene compounds. They are not regulated air pollutants, that is, they do not appear on the State's Air Toxic list, so they're not considered air toxics. Their issue is simply a nuisance issue with odor.

And these facilities emit a lot of mono-terpenes and we were able to determine emissions per plant, mass emissions per plant and the engineers in the Spokane Clean Air Agency a reason that they needed to figure out what best practices might be to try to eliminate odor from these big warehouses. Primarily indoor grow operations. So they are still working on that and I think they have initiated something with the growers up there to try to put filtration systems on the bigger facilities to try to reduce emissions. So that issue is still outstanding and it's a nuisance issue, it's not a health issue, in their mind.

Chad Whetzel – Are there any questions from the Board?

Dave Gibney – So this was the City of Spokane or the County of Spokane?

Tom Jobson – It is the Spokane County Clean Air Agency. The air quality management district for that area.

Keith Paulson – So you said these were the indoor places or warehouses?

Tom Jobson – Yes.

Keith Paulson – So, anything with outdoor growing? I mean does it just dissipate faster, is it still there?

Tom Jobson – Say that again.

Keith Paulson – With outdoor grows, is it still there, the fumes and stuff, the odor?

Tom Jobson – I would guess so. We did not do anything with the bigger outdoor grow facilities. In Spokane, there are people who have small grow operations outdoors, it's because they are behind fences, like welding shops and stuff like that. But, not big places, so they didn't bother with those little guys. The problem with indoor facilities, these are major warehouses, they have HVAC systems that is pumping air out of a vent on the side of the building, so you get all of the emissions coming out of a vent. If you're outside, of course, you know, the solution to pollution is dilution, that area will be diluted a lot just by wind. So, if you're in an urban area and you're downwind end of one of these plumes from one of these industries that is where the odor complaints will be coming from.

Russell Jamison – Is this odor, these agents, are they heavier than air or are they lighter than air, in other words, like if they had a great big stack, like in the old days with some of the steam plants and things like that, would that help or not?

Tom Jobson – It's just like ventilation in this building, I'm assuming there is a vent somewhere in this building, so it's not like you have hot air exiting the building, that will rise, it's just coming out vertically with some velocity or horizontally with some velocity. And the winds from there will disburse it down wind. So, there is not much point putting a stack in.

Russell Jamison – Okay.

Guy Williams – Was there a consistent ratio, number of plants to the parts per million or however you measured it? Or was is consistent across the board?

Tom Jobson – It seemed like different varieties emit different mono-terpenes in different ratios, so it was hard to, like with a car you can pretty well assume that what is coming out of the exhaust pipe of a car, because they all burn gasoline, but with these plants, the emissions vary depending on the plant.

Guy Williams – Significantly?

Tom Jobson – Yeah, some plants did not emit one type of compound, Terpinolenes and other plants that was the major emitter. So, you got a different odor just for the fact that it emitted this one type of compound. So, it's been done per plant variety. All of them seem to emit Myrcene and that was a common constituent amongst all of the varieties.

Dave Gibney – You did state that none of the things that you found are known to be harmful by EPA or anybody?

Tom Jobson – That is correct. The State has a Clean Air Act, basically it follows the EPA Clean Air Act and there is a list of chemical compounds that are considered air toxics, none of those compounds that we measured are on that list. So, for the Spokane Clean Air Agency, it's not a toxic issue, it's a nuisance issue, just like odor from compost or landfills, it's a simple odor issue.

Dave Gibney – And do you know of any research or measuring that has been done for industrial hemp rather than recreational or medicinal cannabis?

Tom Jobson – I'm not aware of that.

Alan Thomson – Do any of these facilities have filtration systems in them?

Tom Jobson – I'm not aware of that. The big facility that I toured, there is a large warehouse and inside the warehouse, it was divided up into growing rooms and facilities and each of the growing rooms had its own HVAC system, air handling system. And then the whole air handling system of the building was used as another means of conditioning space for workers. I wasn't aware that that facility had any filtration that could remove gases from the airstream being vented and that is why it was part of the list that the Spokane Clean Air Agency examined, that was associated with odor complaints.

Keith Paulson – So beyond Spokane, do you know of any way that you can filter the air to get rid of all this?

Tom Jobson – Yeah, there are major industrial filtration systems for this very thing, it's just a matter of does the industry want to spend the money on it? And I think that is where the Spokane Clean Air Agency is discussing that with these facilities. What do they have to do remove odor from the vents. It seems like it would be pretty straight forward.

Gary Moore – That is what I wanted to know too.

Chad Whetzel – Thank you very much Tom.

Mark Storey – Mr. Paulson asked the same question that I had.

Chad Whetzel – Okay, next we will hear from John Wyrick

John Wyrick – I am an Associate Professor in the School of Molecular Biosciences. I don't have any financial conflicts of interest to disclose related to this issue, I am funded by NIH, primarily. The National Institutes of Health. And my lab does primary research on carcinogens and their effects on any damage, repair and mutations, primarily in skin

cancer, but also with some toxic compounds and agents that are used in chemotherapy. Our work is on understanding how those kinds of compounds, as well as, what causes cancer. I'm not researching marijuana, but I became interested in this issue and actually spoke at the moratorium hearing last month. So, David Gang and Alan Thomson asked me to come a talk about that. I have done extensive research on the (*inaudible*)...as well as give you some papers to think about this issue. It is an interesting issue.

Before I get started on aerosol effects of marijuana, I just want to strip your mind of, in terms of actually smoking marijuana, as far as we know, at the molecular level, it has very similar impacts as smoking tobacco. There has been a lot of studies done with the composition of the smoke coming from smoking marijuana and qualitatively the compounds are essentially the same as smoking tobacco. People who have done the genesis studies in marijuana, for example, there is a paper that I can give you if you're interested, but it's not directly related to the issue that we're talking about tonight, but Health Canada did a really nice study looking at the mutagenicity of marijuana smoke. And they found out that it is more mutagenic than tobacco smoke. There has also been a study done in women who smoke marijuana, either themselves or when they are pregnant, looking at the mutagenesis in blood cells derived from those individuals or from the newborn baby, as well as, the mother. And mutation rates go up if you smoke marijuana, just like they go up when you smoke tobacco. There is quite a bit of evidence that marijuana is mutagenic, you smoke it, and you burn it. There is a lot of interest now, is it actually directly linked to cancer, lung cancer, the evidence for that is much less strong. There is a lot of confusion there, it's very difficult to do, because for the longest time, when you are doing epidemiological studies, you either think cohort people, who are recognized marijuana smokers and until it has been legalized, it really hasn't been available and there is confounding effects of tobacco, people smoking tobacco and well as marijuana. And I would say that at that point, the jury is still out, as to whether it causes different types of cancers, including lung cancer and more work is needed for that. There could be reasons that it wouldn't that people have looked into.

However, even if you volatize, (*inaudible*) I don't use marijuana, personally, but researching this, there are a lot of people who are volatizing, almost like an e-cigarette for marijuana, which I understand is called dabbing. Where instead of burning or smoking a joint, you are volatizing. A paper just came out a year or two ago in ACS (American Cancer Society) omega journal, looking at, is that toxic to volatize marijuana. Essentially the resinous, isolation of the marijuana plant, usually using butane. Interestingly, it might very well be, and the interesting thing, and this is from a paper by Portland State University, essentially what they showed is if you look at what compounds are emitted when you volatize marijuana extract, a number of them are toxic. Examples would be, benzene and methacrolein, which are both known toxins. Benzene has been studied and is a really bad pollution compound. And what appears to be happening is, things like myrcene and some of the other terpenes, will break down if you heat them up and it will form these toxic byproducts. Again this is very preliminary research, I should emphasize this, a lot more research needs to be done, but there is evidence that you may have potentially hazardous levels of these compounds during

the (*inaudible*). And that is something that would also be an issue, these e-cigarettes are using flavored terpenes into the e-cigarette.

Interestingly, I am not an expert on cannabis, but I have done some research on this in preparation for this meeting and thought I should probably know something on this. It's interesting, but terpenes themselves don't have to be heated up to break down and form these toxic chemicals. And so there is a lot of evidence now, and I didn't realize this, that because a lot of people complain about issues working in indoor environments, particularly where you have a lot of furniture that has these pine, these stains and cleaners and stuff like that, that have all these terpenes. Things like air fresheners, things that smell like pine or lemon scent and those are the similar terpenes that you would get coming out of marijuana. It turns out that in the presence of ozone, which you have everywhere, you know the ozone is ubiquitous, it will react with those terpene compounds and form toxic products including, formaldehyde, and other aldehydes and ketones and formaldehyde is a known carcinogen, in those reactions. And so there has been a lot of interest in trying to understand, and there is a whole literature on this related at all to marijuana necessarily, there hasn't been a link or anything, at this point. But you get all these oxidation products, these terpenes that are potentially linked to adverse health effects. People have done studies with mice, they've done with human volunteers where they've put these oxidized terpenes in their eyes or in the lungs and they do see effects that those cause. Again, not that they cause cancer, necessarily, but they do get sensory irritation and (*inaudible*) at times. So, while the terpenes themselves are not in issue, I would say as far as I know, the reaction products of those are a potential issue.

Interestingly, there is a paper that came out in Science Magazine, which is the premier science journal in the US talking about this issue related to more on the pollution side. So it's called "Growth of legal pot farms drives smog worries". This came out in January 2019, in Science Magazine, which was highlighting a paper which was published in The Journal of Atmospheric Environment, where they essentially measured the levels of these biogenic volatile organic compounds (VOC's), which would include terpenes, mono-terpenes, their levels and trying to estimate how much of the plant is generating these and then how much would that contribute to smog and air pollution. They focused on the Denver area in Colorado. But what their measurements essentially say is, that if you were to extrapolate, and again this is very preliminary, (*inaudible*) and I can give you a copy of this if you're interested.

Chad Whetzel – Please do.

John Wyrick – It's not really a big large scale study to see what is the actual impact, in more detail, but this group from the University of North Carolina, showed that potentially, one estimate, they could essentially be doubling the amount of biogenic volatile organic compounds that air pollution in the Colorado area, which is a major metropolitan area. Now they have 600 grow facilities there, so there are a lot of plants being grown there, but it will potentially be an issue for smog and air pollution. The reason it may cause smog and air pollution is because, from what I understand, I'm not

an expert in this, when these terpenes are oxidized, and all the double bonds in the terpenes are (*inaudible*) to the oxidation by the ozone or hydroxyl radicals, which you'll have in the atmosphere or other reactive compounds, once they react they tend to clump together to form these smog particles. And those particles will then become these smog particles that essentially cause breathing effects and things like that.

Interestingly, this is kind of interesting, sorry to get off my tangent for just a second, but there is some evidence that those can actually change the climate. This is very speculative, but there is a study that came out about the pine forests, because pines emit a lot of pinene, for example. They have a lot of terpenes and they're probably the biggest ones besides, marijuana is up there, but one of the biggest ones to do that. They emit these compounds, they get oxidized in the environment and then those little small micro particles seed clouds. So there is the model out there, this was published in Science and Nature, in 2016 and 2014, that essentially trees are kind of making clouds to rain on them. They're emitting these compounds to get more overcast sky and then they would cause more rain. It was a big deal and the reason was published in these top science journals, Science and Nature, is because they're models before was only sulfur dioxide, if I remember right, which is emitted by power plants, would seed clouds. But it turns out these organic compounds, that break down products and these terpenes also will seed clouds and potentially increase the amount of overcast cloud cover and it could potentially affect the amount of rain. And that is very speculative at this point, but it would be interesting to look at it. Especially if the amount of terpenes being giving off by lots of grow facilities, how much impact that would have. That would be very interesting, in my mind to look at.

To summarize, in terms of the terpenes, while they themselves may be not negative, they can definitely make very negative break down products. Formaldehyde, benzene, other things like that, you know the aldehydes and ketones and things like that. So, I think that is a serious issue that needs to be looked into. And that is why Colorado is doing a big study on this and they can make this secondary aerosol seed total particulate matter, it would be an issue in terms of air pollution in this area.

Finally, in terms of the nuisance smell, I can personally say it is a nuisance from my own perspective and I can be bias about this. We had, when we were living in Pullman, it turns out over time, a year or two ago, we had this really kind of strong sweet skunk smell in our back yard, so we kept our kids inside. It turns out we found out, just recently actually, that we didn't know we had a skunk problem, a neighbor a few houses down was actually growing marijuana in their greenhouse back there and so when it got to the blooms, the amount of terpenes being emitted and other compounds were there during the growth stage, it was a very unpleasant smell there. And then we had also run into it driving on Airport Road, you had a very strong smell. There are a lot of issues about that, I found that there are a number of, like the New York Times article, an article in North Bay Business Journal about the smells that are associated with marijuana and how people are unhappy about that, being able to smell it ½ -1 mile away. People being interviewed saying that the nearest was a mile away. And they were complaining of headaches and things like that, which is actually the same kind of thing people

complain about when they are exposed to these pine scented air fresheners. Sorry to divert you, but air fresheners are actually bad for you, because they emit these terpenes and there have been a lot of articles about having these air fresheners emitting all these terpene smells, because again they for these toxic compounds. It's kind of like, we were really big on no tanning beds, because you don't want extra UV light, (*inaudible*) use tanning beds at home, there were massive numbers of tanning beds (*inaudible*) and it certainly linked to cancer. And air fresheners are kind of the same thing. So in the marijuana case, if you're down wind of a marijuana facility that is not using a simple carbon filtration unit to clean up their air, you're essentially being forced to live near, have this massive air freshener blasting your house, instead if it smelling like a pine scent, it smells like a skunk. It's kind of the worst of both worlds, in that case. The other thing that is interesting is, as far as I know, and somebody correct me if I'm wrong, people don't really know what exactly compounds are causing the skunk smell, because Pinene and Limonene and those smells like Limonene, if I remember right is pretty common in citrus, that would be more of an orangey, citrusy right. Pinene is more of a pine smell, but marijuana has a pretty distinctive smell, it's a little bit different than those. It doesn't smell like a forest or an orange grove, it smells like a skunk, in my experience. So, there is a lot thinking, what compounds actually causing this skunk smell and there is actually a paper in Plos One that came out in 2015, from Rice and Koziel, from Iowa State University, where they went through and characterized all the different volatile compounds in prepared marijuana. It's not smoked, it's just prepared. What they found is, if I remember right, they found in the order of like 200 different compounds. And they tried to correspond to which ones gave us the strongest scent, the strongest scent of a marijuana smell, and it wasn't necessarily the terpenes. So, a skunk smell is usually, the thiols and it could very well be some kind thiol on it that is causing the odiferous smell. We don't know what the potential hazards of that might be. Obviously getting sprayed by a skunk is not a pleasant experience. And it actually could cause significant harm to dogs, they can die if they get sprayed.

So, there is still more to be learned, I think. And a lot of it, the emphasis is, a lot of these things are just beginning, like this on, out of the University of North Carolina about the smog, that was one of the first studies, because it's been hard to do up to this point, because of the difficulty of working with many states and certainly federally, is it's an illegal substance.

Finally, the last thing that I want to mention is, well two things. One, there is a lot of mold that is known to be associated with marijuana growing. And I know a lot of people, like in some situations they were required to irradiate, to kill mold spores associated with marijuana and there have been cases, I have found a couple cases, where people had Aspergillus infections associated with the bonding(?) use. So that is an issue with, not only with using marijuana, but with growing marijuana. So, that is something to consider, those kinds of potential hazards. There is also known allergies to cannabis, so that is a potential issue, so if you're prone to allergies for people who are working with cannabis. Or if you are downwind, there has been studies in that regard.

And then finally, I know there are a lot of issues about milk and dairy. And that is one of the issues that is coming up here. I think that is a really important issue that really is, at this point (*inaudible*) studied and I know Dr. Gang can probably speak a lot more to this than I can. But, I looked at some of the papers he had found about the potential transfer of terpenes and other compounds to milk and I can just quickly summarize what I found in reading this, because this has been debated, I remember in the moratorium. And I think one of the issues here is this kind of negative, the possibility that that might be relevant. So, first of all, it's know that if cows, it's been published in the Journal of Toxicology and Clinical Toxicology, back in 1990. There was an interesting study where buffalos in Pakistan that were allowed to graze on marijuana plants. In that case it was clear that there was THC in the milk and there was also in children who drank that milk. And so that is kind of interesting, especially for the hemp industry, because there is talk of using hemp as silage for dairy cows. And even though hemp is supposed to have low THC, it still has some, in some cases, less than .2%, I think is what they have said. So, that could be a potential issue, the feeding. It's also known, for example, that if women smoke marijuana, I understand that they will also have THC in their breast milk. And the issue then, and it's not a big issue for grow, because the amount of THC being involved is very minimal, as far as I know. But, the main issue would obviously be the terpenes, because they are the biggest compounds. The one paper from 2013, from Denmark, did show that if you expose cows to terpenes you will see, just in a sponge, if I remember right, in an enclosed chamber, you will see those terpenes showing up in the milk, when they breathe the air. And they tried to use, like 50 grams of oil and they tried to get the amount of terpenes, like for 9 hours to have a smell in the room that would be consistent with a clear smell. I think they were using oregano and something else. So you can definitely transfer terpenes via smell, the question is, is that really relevant for marijuana, no clue. We need further studies on that. They weren't looking at marijuana at all, they were just looking at the, can you get an effect on the flavor. I certainly think that it's possible, the question is, is it probable and again more research is needed to look into that. This paper certainly doesn't definitively say that, but it certainly doesn't rule it out either. And the key thing with science is, the absence of evidence doesn't imply the evidence of absence. Just because there's no study yet, showing that this can count for this, it doesn't mean that it can't count for this. And certainly a study has been shown that it potentially could happen. And the question is, is the levels of terpenes that you would have coming out of a grow facility, that distance away, would they be high enough to potentially influence the milk. The other thing they should mention is, terpenes can also be directly absorbed into milk, that's been shown, from what I understand. And I'm not an expert in this. So, even if the cows aren't breathing it in, having the milk in the dairy facility you could potentially get direct absorptions, from what I understand.

Anyways, sorry to run for so long, but that's my take on it.

Chad Whetzel – Does the Board have any questions? Thank you.

John Wyrick – Let me grab those papers and I'll pass them along.

Chad Whetzel – Yeah, if you could pass them to either Katrin or Alan there, they will get copies for us. Next, can Jon Davis come forward?

Jon Davis – Sorry I have a cold and I will do my best to speak up. I work at WSU in the Department of Integrative Physiology and Neuroscience. My lab studies how the gut communicates with the brain to control feeding behavior. And one of the things that we have been studying, for about 2 ½ - 3 years is how cannabis stimulates appetite. I've got no conflicts of interest to disclose. My funding for that project is from the State of Washington. The real issue is that we're trying to understand how cannabis stimulates appetite for people who have cancer. Because about 2/3 of cancer patients die from muscle wasting and anorexia and not the disease itself. This is just a little bit of background about why we sort of got into that. What we do is we take animals, laboratory animals, rodents, mice and rats and we actually expose them to vaporized or volatilized cannabis. The cannabis that we get is from the federal government, it's from NIDA, National Institute of Drug Abuse, drug supply. And so, we know the exact quantities of THC and CBD that are in it. Again we vaporize the cannabis and we give it to the animals and we do, a sort of battery of tests on them. We look at their endocrine profiles in their blood. So, we measure hormones, we measure feeding behavior, we measure stress behavior, motivated behavior, learning and those sorts of things. What I can tell you is that the effects that we've found over about 2 ½ years is that it is a very acute affect, so in other words, when we give an animal cannabis and we vaporize it, and we look at feeding, the animals will eat more to about 2 hours after they've been given cannabis and they eat more for about an hour or two and then that's it. They don't gain significant body weight or body fat or anything like that, when we do that. There is no impairments in movement that we've detected. We've measured hormones in their blood that are appetite stimulatory and we see increases in appetite stimulatory, perhaps not surprising after you've given them vaporized marijuana.

Now our control animals go through the exact same regiment, in other words, they're put into a vaporized cannabis chamber and instead of vaporizing cannabis there's air that is actually just turned, so that the system is turned on. And so they smell all of the byproducts, but they're not actually getting any real exposure to cannabis. And we verify that because we measure the THC in their blood and we measure it within 5-minutes after we expose them. And those animals show absolutely no changes in behavior whatsoever, that we've ever seen. And that is true for rats and mice. Now, we've also measured genetic changes in their brain and again these changes would be occurring within an hour after exposure. And the genetic changes that we've see signify changes that would increase feeding behavior, primarily. The brain is a pretty complex structure, so we haven't looked everywhere yet, but in the areas that we have looked, it seemingly it's telling us that there is genetic programming events that are helping adapt to eat more.

That is about all I can tell you about our cannabis studies, so far.

Chad Whetzel – Are there any questions? And you said that was on the volatilized cannabis, correct? We're not talking about smoking or anything like that?

Jon Davis – It's a vaporizer, yes.

Chad Whetzel – Which would be similar to some of the, I guess, the industrial processes, possibly.

Jon Davis – You know, I can't directly speak to that, I can just compare it to what Dr. Wyrick just said. I think what he was mentioning were concentrated extracts from plants and that is not what we're doing. We're using dry plant matter and we base that on the sales. Actually in the State of Washington, about 75% of the sales is in dry plant matter, the bud of the plant. And so our system is set up to actually vaporize that, so not concentrated extracts. So, it would be similar to what would happen if you took one of the plants as being grown in a greenhouse, over here and vaporized it, not concentrating it to where the THC is really, really high and then volatilizing that. And so, as a consequence of that, we measured THC directly in the animal's blood once we volatilize the plant matter, in other words, just to make sure that we see THC, did it have an effect at all. That was kind of our first start. But, that is a little bit different than what Dr. Wyrick mentioned, in terms of the more concentrated extracts, because those have to go through a process to actually be formed and put into the e-cigarette. So, mentioning butane and those sorts of things, that is actually part of the process to get those high concentrated extracts. But, that is not what we are doing.

Chad Whetzel – Okay.

Keith Paulson – Have you done anything on feeding the cows marijuana?

Jon Davis – Feeding the cows marijuana?

Keith Paulson – I mean, like as hay?

Jon Davis – No, I've never done any studies on cows. I do teach GI Physiology, I do know that a major source of Methane, which is also volatile is actually cows, so anybody who owns cows knows one of the main things is, burping, you know cows burp all the time, they burp out a lot of methane and if they don't, you're in serious trouble. That is about all I can tell you on cows, but no we don't study cows, we study rats and mice.

Keith Paulson – You haven't fed the rats any marijuana, as far as feeding them.

Jon Davis – Oh, fed them the marijuana. No we haven't. That is a very good question that we've been trying to address, but it's very difficult, because all of the sort of edibles that you have, are different concentrations. There is a really good study that came out earlier this year that said, that what you think is this THC concentration could be hordes of magnitude off. And one of the reasons we don't study the edible part is because the cancer patients, believe it or not, prefer vaporizing, because they can control their dose. Once you've had a pot brownie, if it's too much, you're in trouble, you're sick. Versus when you're vaporizing you can kind of titrate how much you're getting. So, you wouldn't necessarily think that people that had cancer would want to put anything into

their lungs, but in fact that is what the trend is now, so they can actually control it. But, we haven't done anything in terms of edibles with the animals quite yet.

Keith Paulson – Thank you.

Chad Whetzel – Is there anyone else. Thank you very much. Ryan McLaughlin.

Ryan McLaughlin – Good evening everyone. I'm an Assistant Professor in the Department of Integrative Physiology and Neuroscience at Washington State University. So I work in the same department as Dr. Davis. My research is also using animal models. We use rats and mice as a tool to understand the development effects of cannabis on the brain and behavior. So, our questions are mostly centered on exposure to cannabis during sensitive developmental periods, such as prenatal exposure or cannabis exposure during pregnancy, as well as cannabis exposure during adolescence and its impact on brain development. And the cognitive and emotional components of those. We're very much interested in that. So, I have been studying cannabis and not just cannabis but the endogenous system on which cannabis acts. We have an endogenous system called the Endocannabinoid System, which is very similar, I often refer to it as, most people are aware of endorphins, as being kind of our naturally occurring morphine. Our endogenous pain killing molecules. Well, it just so happens that we also have endogenous cannabis like molecules as well, which we term Endocannabinoids. They are very ubiquitous throughout our brains, throughout our bodies and the receptors to which they bind, as well as the receptor to which cannabis constituents like THC bind, are actually some of the most bonded receptors throughout the brain and throughout the body. So, they're very, very prevalent and they have a very important role in regulating just normal synaptic function and brain development. So, I'm very much interested in seeing how cannabis might interfere with that. So, I do have some understanding of what cannabis does to the brain, what cannabis actually is and maybe what it isn't. I want to just maybe talk about that first, because my understanding, and this is my first time at the meeting, my understanding is that a lot of the concerns that have been raised here have been with respect to the use or the growing of cannabis plant and the fumes and the smells and the possibility for it to seep into the irrigation and affect the cows, affect the wildlife and this sort of thing.

The thing that I wanted to mention is that in the cannabis plant, THC as we know it, the psychoactive constituent of cannabis, does not actually, there is very, very little THC in the cannabis plant as itself. It exists as a compound called THCA, which is an acid form of THC. And in order for you to actually feel the intoxicating effects of cannabis, you need to, what we say, what we call decarboxylate the THC and that basically means that we have to remove the acid group from the THC. The way that you do that is by heating, so that is why people smoke cannabis. If you were to just pick up a plant and start munching on it and eating it, you wouldn't get intoxicated from that. That does not make you intoxicated. Anyone who has tried to make marijuana grounds without actually cooking the marijuana first would realize this, it's quite well known. So, I think that a lot of the issues or a lot of the concerns that we might have, we should make sure that we're talking about a plant that doesn't exhibit a whole lot of endogenous THC. It's

actually a THCA form, which is a more of an inactive form of THC. So, I am not super concerned, I wouldn't be super concerned about the effects of the plant in its non-decarboxylated form. The other thing to mention is THC and these other cannabinoids or plant derived cannabis molecules, they're basically fat molecules, they're lipids. And lipids don't dissolve in water and we've worked with these cannabinoids for a long time and they're very, very difficult to get into a solution. So, I think that is another thing that I should mention.

That the risk for cannabis to actually get into the water and for THC, (inaudible) will dissolve and into the water stream, for instance, is very low. It's unlikely that that is going to happen. I think what was brought up about terpenes is probably what you are all a little bit concerned of, because I think a lot of people probably who maybe don't know a whole lot about the cannabis plant, they smell the plant, it smells pungent, it smells toxic, it smells bad to you, and a lot of people equate that with maybe with the intoxicating component of the plant. They think, oh I smell that and thus I'm smelling the THC or I'm smelling the thing that makes people high and that's not the case. It's actually like others have said, it's the monoterpenes that you're actually smelling. And I think that there has been some evidence that has been presented about the potential detrimental effects of terpenes on the brain and the body, but it's interesting because I think there is just as large, if not an even larger literature to show that the terpenes have anti-inflammatory properties, they have analgesic properties, they have anti-tumorigenic properties and there are very extensive review papers that have been published on this, both in animal models, as well as cell cultures, looking in cultures that are looking at cancer cells, for instance. A lot of this has shown that these components have antioxidant and anti-inflammatory properties. So much so actually that the National Institute of Health, which is the organization which my research is funded by, and I do not have any conflicts of interests to disclose, but the National Institute of Health just recently released a request for applications amongst researchers in the United States to develop studies to examine the punitive analgesic properties of non-primary cannabinoids in terpenes. So, they're actually trying to target these other non-THC, non-intoxicating components of the plant, trying to derive those and trying to understand what those effects are and then perhaps be able to use those in treatment without the adverse effects of cannabis. So, a lot of people are actually going towards the terpenes and trying to harvest the therapeutic potential of those terpenes to treat some of the issues that people are currently using cannabis for. So, again these are naturally occurring compounds. The vast majority of the alpha beta pinene that we see in the world are from pine trees, so it's a little bit surprising to me that these would have such pervasive effects and long term effects on air quality, considering the number of pine trees that we have. Myrcene as well being the most predominant cannabinoid or cannabis based terpene is actually the most prominent component of hops as well. The cannabis and the hops plants are very close relatives, so myrcene is a very prominent component of it. Up to 40% of its weight, of its mass is myrcene. We're not necessarily as much concerned about growing plants or hops for alcohol purposes, so I just want to make sure that there is not a lot of, that we clear up some misconceptions, I think, about what terpenes are actually doing. And really, I think, the consensus, at least in the neuroscience and the mental health research field right now, is that we can actually

utilize the power of terpenes to try and treat some disorders, whether they be for pain or eating disorders or inflammatory disorders as well. So, I think again, like it was stated, there is still a lot of research that needs to be done on this. But, I really feel like its maybe a little bit premature to consider the long term health effects of growing a small, whatever is being planned here, I'm not sure how many grow sites are being proposed or if it's going to reach anywhere near the scale or magnitude that they are seeing in Colorado, for instance, my guess is probably not. I just think that maybe we should pump the breaks a little and we need to understand that these compounds are not necessarily quite as harmful as we may be thinking. It's very similar to kind of how we understood or how we developed aspirin from studying willow bark. We didn't really know about this, but we were able to derive a specific chemical or specific component of a naturally based plant. We used that and developed it into a pharmaceutical and now we use that quite regularly as well. So, that is the National Institute of Health approach to understanding and utilizing terpenes and other non-THC cannabinoids, is to try and naturally understand, are there positive or potentially negative health benefits towards these. And if so, how can we use them effectively in a clinic. Aromatherapy is essentially exposure to terpenes. People are using aromatherapy all the time and they claim to have very reasonable and valid affects from being exposed to these terpenes. For instance the linalool compound in lavender, for instance, there is a lot of evidence to suggest that it could have anti-inflammatory and sedative effects and could help people sleep and help people relax. So, until the research on what the actual effects of the terpenes are, I think we don't, I don't necessarily want us all to confound the potentially negative effects of smoking cannabis, and actually causing the decarboxylation of the THCA causing you to be intoxicated is very different from just having the plant there and smelling the plant. I don't think that we're going to reach that sort of level of air pollution from the level of growth that is being proposed here.

So, that is my perspective on it.

Chad Whetzel – Thank you. Are there any questions from the Board? Thank you very much, appreciate it. Next up, David Gang.

David Gang – I'm the Assistant Director of the Agricultural Research Center at Washington State University also known as the AG Experiment Station. I'm also a full Professor in the Institute of Biological Chemistry. I'm the past President of Phytochemical Society of North America. I'm on the Executive Board of the Groupe Polyphenols, International Scientific Society, which studies bioactive and compounds, especially things that are related to anti-inflammatory activities. I also, it's not really a conflict of interest, but I'm Chief Science Officer of a small start-up company which doesn't work on cannabis, it works on turmeric. Another anti-inflammatory plant and we're developing anti-inflammatory compounds from that. It has nothing to do with cannabis. I have given you some information about that just to give you an idea of who I am and what my experience is. I have been working on the chemistry and biochemistry of volatile compounds produced by plants for almost 30 years, next year will be 30 years, so I've been doing this for a very long time.

I have read many, many, many papers, I have published several dozen papers in this field and so I think I come from an area of a little bit of experience. So, hopefully what I have to say will be a little bit of use to you today. And I've tried to put in a good due-diligence, when I was given this task to kind of address this issue by my boss at WSU, our Dean, he asked me to come to that previous meeting and deliver a letter because we were concerned, because our Chair of the Animal Sciences Department, Kris Johnson, who is here in the audience, she found this paper that suggested that terpenes could potentially end up in milk and the paper wasn't, as you heard earlier, it wasn't from terpenes, the study wasn't done with marijuana or cannabis, it was done with plants that are normally used as culinary herbs, but they contain the same compounds. They contain limonene, they contain pinene, and they contain myrcene. And that study said, that yes in the Oregon example, if you put them in an enclosed environment, and that is the first paper on top here, I'd call it the notorious paper that kind of started this ball rolling, in some ways. It suggested that this is a possibility. And so our question was then, if it was a possibility, is it really a probability or is it just a one-off paper that maybe somebody suggested something and maybe it wasn't something that was really going to be important after all. So, we did a lot of research into this area, and instead of finding one paper, we found actually a couple dozen papers, quite easily, that talk about how milk absorbs compounds that cows either ingest or re-vent. And if they ingest them, as we heard earlier, cows burp and the way that the compounds that they ingest actually get into the milk is because they burp it out and then they breathe it back in. And I've got papers in this stack that talk about that. So if you go down a couple of papers, I also have done research on cannabis, I published one of the first studies on the genes that are involved in making the (*inaudible*) in the plant, in cannabis sativa. There is a paper published, like the 3rd one down here that says "Research Papers" up top "Off Flavors of Milk". It was published in 1978, it's kind of a review summary of the number of papers that were published starting in the 1950's; 1960's; and the 1970's, and just because it was published a long time ago, it does not mean that it's not valid today. In fact, a lot of the work that was done back then is perfectly valid today. What that paper summarizes is, that a lot of compounds that are around cows end up in the milk. And the way that that happens, was at that time was not really understood very well, aside from the fact that when they breathe them in it ends up in the milk. So, what does that mean to us, I'll come back to that in just a minute?

The next series of papers I gave you there are what are called "Safety Data Sheet", they're also called MSDS or Material Safety Data Sheets. And I printed these off for you all to have. They are for the most abundant compounds that the cannabis sativa plant makes. At least as far as most of the strains of either marijuana or hemp are concerned. The first one there is Limonene, and if you look at the 2nd page, and this goes back to what both Ryan McLaughlin and John Wyrick said, if you look at point 2.3, Adverse Human Health Effects and Symptoms, and this is in response to the email that I got from Alan, and he asked, 'Is there any potential human or animal health effects of these compounds?' And it says it causes skin irritation, material may be irritating to the mucous membranes and upper respiratory tract, may be harmful by inhalation, ingestion, or skin absorption, may cause an allergic skin reaction, may cause eye or respiratory system irritation, very toxic to aquatic life with long lasting effects. And then

this is the really important statement, it says “To the best of our knowledge, the toxicological properties have not been thoroughly investigated.” And this is like their most up-to-date sheet. I just got it off the website yesterday. And that is the same for all these compounds, it basically says the same thing. All these compounds under the right circumstance are toxic or dangerous to something. That is why plants make them. Plants can’t fight back, they don’t have teeth, they don’t chew, they don’t bite, what they do is, they make poisons. That is how they defend themselves. So, saying that something is natural does not mean that it is safe. Plants produce lots of very, very toxic compounds. And what I have been interested in my whole career is trying to understand how those toxic compounds are made and which ones are toxic to humans and why. Which ones are toxic to bacteria and why. Which ones are toxic to other animals or fish or microbes or whatever it is. We use a lot of these compounds in our health practices and in our cosmetics and in our cleaning of our houses, because we find the smell is pleasant and they don’t really affect us very much, but they do great wonderful things to kill bacteria. Limonene is a good example of that. It’s quite toxic to lots of bacteria, but it’s not very toxic to most people. We heard that stated earlier and that’s pretty true.

If you go to the next document “D-Limonene: Safety and Clinical Applications”, and it goes through the whole summary of the whole series of studies. It talks about anti-cancer activity and it does mention that in some cases it might be slightly toxic to some people. And it’s important to remember, that as was mentioned earlier, that most of these compounds have not actually really been studied. And that is why that MSDS sheet said what it did. But to the best of their knowledge, this hasn’t been thoroughly studied. The reality is, is that most terpenes have not been studied for their toxicity effects. Most of them have not been studied for their environmental effects. There was a study, a large research project that was funded by Genome Canada, a big research funding agency up in Canada, a number of years ago. It was led by a former Post Doc here at Washington State University, his name (*Inaudible*) Bowman and Mark Lange and I know him really well, he’s a friend of ours. And they were interested in this question of the Bark Beetles. Maybe you guys have heard about the Bark Beetle problem and how they are infesting the trees. And if you’ve ever gone to Canada, you will see there are vast tracks of the Canadian west where the trees are basically gone, it’s because they all died by the Bark Beetle and then the forests burn. And what they are finding, and they did some really interesting first modeling and now investigations about this, and it goes back to what John Wyrick said, is that they actually have really good evidence that the climate is changing locally in that area because the pine trees are no longer there. So, the pine trees really did have a significant impact on that environment and British Columbia and Alberta are facing this serious problem with their water issues now, because the pine forests have disappeared. Now, if we put plants in that produce those compounds maybe that would be reversed, we don’t know. But, the point here is that, plants produce a lot of compounds, they get into air and they do affect the environment. Now, if they can affect water vapor and if they can react to the ozone, what happens here in the summer when we have our wildfires and smoke comes into the area and we have those stagnant days and one of these facilities is producing these compounds and it pumps it out into the air, and then those smoke particles interact with it and react with

it, what are the products that are going to be formed? The answer is, we actually have no clue, we don't know. At this point nobody has done any studies to look at that. Is it going to be okay, are we going to be safe? We don't know. So, at this point we need to think about, do we be a little bit conservative, a little bit cautious or do we just kind of throw caution to the wind and say it'll be okay. And I think we need to be, and in your position in the County you have a really important place to think about what the future of the county is going to be and can we think about how we regulate what we do in a way that is smart, that both facilitates economic growth development, allows industries like the Selway/Dewey group to come in and put together their facility and spur research and allow them to do things that will benefit, we hope society. But, maybe the things that Ryan McLaughlin talked about are really going to come true. Some of those compounds, some of those terpenes really will be important active compounds that will help with the medicine, help develop new treatments and research activities like what those guys are doing might be able to do that. But can we do it in a way that doesn't impact the rest of society. I think that is a really important thing to think about.

Okay, the next paper. This is kind of interesting. It goes to the other question of the essential oils. Now my wife and her sister are really big into essential oils. They use them for lots of things and as I was looking and as I was studying this topic to present here, I ran across a couple of really interesting studies that kind of surprised me. And what they have found is, that Tea Tree oil, which is also called Melaleuca, which my wife likes to put on our kids feet, because it helps with a lot of different things, she thinks. It turns out that Lavender oil, which is supposed to help you sleep, that if you are a young man maybe you really don't want that on your body because it could lead to a condition where you develop breasts, prematurely, which men usually don't. So, it's an endocrine receptor inhibitor, is what it is. It interferes with endocrine system. And the compounds that have been contributed to that are some of these exact same monoterpenes that we've been hearing about today. Now what that points to is, and of course that was a topical application, that wasn't breathed in, it was a much higher dose. But the question is, and this is something that I hope you get out of what I am trying to say here, is that something that is a medicine at one dose is a toxin at another dose. And something that is a medicine to one person is a toxin to another person. And just because a study was done with, and in the case of a lot of these compounds, like Limonene, they've done a few studies on, and that paper talks about it, how many, looking at the potential toxicology of it, the first study was done on two people. Two men that were adults. The next study was done on seven people, that's it. And they found in those studies, yeah it was sick (?). But that didn't look at the large population. And what we need to think about is, yeah we have a lot of people in our population that are not the average person. We have a lot of people who have sensitivities, who have allergies, they have allergic reactions to certain compounds, and we talked about that earlier about the whole issue with the air fresheners, right? And we need to think about, not just the average person, but we need to think about all of the individuals in our society and what impact of what we do, may have on them. And that is what the research is suggesting today, at least what we have right now, is that there aren't any real clear answers, that as a whole population, that everybody is effected negatively by these things, but there is suggestions that certain individuals might be negatively

impacted. And it's also important to remember that a terpene is not a terpene, right? Just like every person in this room is not every person in this room. Each terpene is a specific individual compound that has specific properties. They're very different from each other. Some of them might be off of pinene, which is produced by pine trees. Linalool is another one, which is produced by a lot of flowers. Myrcene is another one, it's produced by cannabis and it's produced by sweet basil. It's one of the things that gives sweet basil its sweet taste. I eat sweet basil all the time, myrcene is a great thing. A lot of people have to be careful working in sweet basil fields because they eventually develop an allergic sensitivity to it and they get rashes and it's because they're exposed to things like that individual compound. So, individual terpenes have potential therapeutic activities, others may not. So, we have to think about these at the individual level. It's kind of difficult to do that, I understand, but that is really what we are looking at here.

Okay, so then there is another paper here, called "Exposure to Terpenes: Effects on Pulmonary Function". Where they look at mainly alpha-pinene (*inaudible*) and they found that in certain individuals it caused a reaction in their lungs that was bad. The next paper, upper respiratory irritation of terpene/ozone oxidation products, basically it says the same thing and it refers to what Dr. Wyrick said. Another paper is, residential ambient air limonene associated with asthma. This is actually a really important and interesting study. What they found is that children that lived in houses where their moms cleaned with pine scented cleaners, that had alpha-pinene in it, had a very much higher risk of having asthma, than children who didn't. Now the question is, did the mothers have asthmatic children and therefore try to clean or did the children develop asthma because their mothers were cleaning? The answer is, we don't know right now. This is the first study in this area. The whole point here is, that we are really at the cusp of a whole new research area, but I think over the next 10 years we're going to see it explode on us. We're going to find that a lot of studies are done, NIH is going to have a lot more calls like the one that Ryan McLaughlin talked about. Are these things really efficacious, do they really do anything? Can we find a therapeutic activity? If you ingest it, it might treat cancer, limonene has been shown that if you ingest it, and you're a woman and you have breast cancer, it ends up in the breast tissue, that's one of the papers that I gave you, and it helps reduce the growth of the cancer cells. But, if you breathe it in and you're a young man, you might get asthma. So, the question is, how is it affecting each individual person? And the answer is, is that each compound effects each individual differently.

Now onto the question of milk. There is a whole series of papers here and because of time, I'm not going to go through all of them, you can look at them if you want. What they basically say is what I said before, that if a cow eats it, it ends up in the milk. If a cow eats it, they burp it out, they breathe it in, and it ends up in the milk. If a cow breathes it in, it ends up in the milk. Some of these compounds actually are beneficial. People in Switzerland like to put their cows in the upper meadows where they have high terpene containing plants that produce certain profiles of terpenes. Remember, not all terpenes are the same. And that affects the cheese that is produced and they measure the terpenes in those cheeses. And I have papers that talk about that. If they put them

in different places, then different terpenes that are produced, then the cheeses are different. So, depending on where a cow is, what it's associated with, what we (*inaudible*) associated with, what it comes in contact with, it is affected differently, it's milk is affected differently and the cheese is affected differently.

So, finally you go back to the question of breast milk, the jury is completely out on this one. There is practically no studies that have been performed. We've looked extensively to find anything in this regard, and what we could find is, this paper called, "Lactational Transfer of Volatile Chemicals in Breast Milk". And what they looked at are things that are kind of nasty, like MTVE(?), tetrahydrochloride and stuff like that. And they're volatile, they can be volatilized and guess what, if the mother breathes it in, it ends up in the milk. Now, not all of the compounds did though, they list a bunch of other compounds that worked and what terpenes were alcohols and aldehydes and things like that. They didn't end up in the mother's milk. So different compounds did end up in the milk and other compounds don't. Nobody's looked at terpenes yet. We don't know if they end up in mother's milk at all, because nobody's done that study. So, we're back to the point that John Wyrick said, which is, lack of evidence is not evidence of a lack of a problem, right? We just don't know.

The other thing that I want to say is, I know that Tom Jobson was joking when he said that, "The Dilution to pollution is solution", right, you all got that, he wasn't serious. The EPA is very clear about that, we don't dilute things out. What that does is, it just moves it to somebody else. So, we don't want to dilute things out and assume that just because we put a lot of air through our facility, it's no longer a problem for the workers, but that means that the people in the community are now facing that problem.

I'll stop there. If you want we can talk about some of the papers, you can look at them. This is just the tip of the iceberg, I kind of ran out of time after I found these 15 or so papers relating to milk and terpenes and etc., etc. There is a whole lot of literature on this and a lot of this.

Brian Davies – Has any research ever come forward about honey, because I know from having honey bees at home, myself, they're in our lavender, they're in other things like that and it tends to taint the taste of our honey. In a pleasant way, but I was just wondering, it's probably the same with honey as it would be with anything else that would be edible or with milk.

David Gang – That is a good questions and I'm not a bee expert, I don't work with bees, we have other people at WSU that could come in and talk with you. But the cannabis is not bee pollinated, its wind pollinated.

Brian Davies – Okay.

David Gang – Now that doesn't mean that the pollen can't end up on other plants. Yeah, if there's enough plants it could happen and people have showed that with other, I mean there was a big study with Monarch Butterflies and maize and GMO's, saying that the

bee “T” toxin that people spread all over the organic fields and then Monsanto introduced into corn and they were finding that pollen on these other plants that the Monarch Butterflies were ingesting, is that a problem? If it is, I don’t know, but could the same thing happen with cannabis? Yeah, if you had a huge population of plants, yeah maybe. That was one thing I didn’t talk about, which I think is really important to think about here. Right now we’re dealing with the cannabis problem, which is about this big (made a movement with his hand(s)) in 2018, in December, just a few months ago, the United States Government passed the farm bill, which legalized hemp. It’s no longer called industrial hemp, it’s just called hemp. It’s like alfalfa, it’s a commodity product. It will be regulated. The State of Washington just passed its bill this last week, saying that we’re basically going to align our policies with this policy of the United States Government, which is if this is a commodity, hemp can be grown in this area, the water requirements range between 15” to 27” to 28” of rain per year, depending on the cultivar. Guess what, that’s where we live, so you could have, instead of an acre of marijuana plants, which is cannabis sativa, you could have a 1,000 acres of hemp plants, which is cannabis sativa. It’s the same species, produces the same compounds, just in different ratios. It’s used for different things, it’s bred to do different things, but it’s the same species. We are facing potentially a much bigger problem with hemp very, very soon down the road. And this is something that I urge you guys to think about this, is where are we going to let people put their hemp fields? I think the State needs to have rules, I hope they’re thinking about this. We’re going to try to engage them at WSU, we’re going to try to engage them to think about it. And I hope you think about it too. It makes sense that could facilitate the industry that is likely to be the modern gold rush that a lot of people think, right? Or the green rush, whatever you want to call it. There is a lot of potential industrial activity that could come from this. There is also a lot of potential impact on everybody around it as well. And if you look in the newspaper and you look online, you find story after story after story around the country, where schools are next to a hemp field, by Medford, and the kids all have headaches and complain of nausea, and they’re told that they need to put air scrubbers on schools so that the kids will be safe, instead of regulating the field that is right next door. Is that what we’re going to do here in Whitman County? And say I’m sorry? You have a kid with allergies and you’re going to have to somehow protect your property, instead of, let’s put the fields out a couple more miles away. So, that is something to think about. I think that they can co-exist in the county, I just don’t think we want hemp fields very close to our houses. That’s my personal opinion, I don’t want one next to my house.

An audience member wanted to ask a question.

Chad Whetzel – If you could ask that at the end, I would appreciate it.

Dave Gibney – In these material safety sheets, the concentrations that are used to show the harm, the first one I looked at, I think it said 100%, is that...

David Gang – What they are saying is, the compound is a pure compound that they used. And yeah, in all of these toxicology studies, if you try to look at them, it’s hard to find exactly what they used. Studies done on mice and on rats, and I think Jon Davis

will tell you this, don't always translate to humans. There are some compounds that are really toxic to mice and rats that are perfectly safe in humans and the other way around. And so, those studies it's hard to draw a conclusion of what those really mean and as far as our health is concerned sometimes.

Dave Gibney – So the level that causes a rash...

David Gang – And that is going to be person to person dependent, it really is. We have a lot of people that have allergies that they can't be around perfume. It causes them to break out into a rash or have anaphylactic shock in some cases. I can sit in a cloud of perfume all day if it smells nice. It just depends on the person. So, are we going to force the people that have sensitivities to tough it out and move somewhere else or are we going to try to protect the sensitive people in our community. And I think we really need to think about the kids here, small children are the ones that are most likely to be impacted by this. And again, not all compounds are the same. Different terpenes are different. Some terpenes are very beneficial and some of them are very, very, like Ryan talked about, very positive, very likely to have really important positive benefits that could help to treat cancer. I don't think they're going to cure it, they're going to help to treat inflammation, they're not going to cure it, but a lot of compounds have that potential benefit and a lot of other terpenes are actually really nasty, you don't want to get them on you. So, it just depends on the compound.

Russell Jamison – Does the hemp plant produce the same terpenes as the marijuana plant then, or are they a little bit different?

David Gang – Each variety or cultivar or whatever you want to call it, produces a different cocktail. Tom Jobson talked about that a little bit, some of them that he mentioned hardly have any terpinolenes, and some have high levels. The pinene levels vary all over the place from low, single digits up to 30%. The limonene the same thing, it totally depends on the variety. And what is known about hemp is that it's a whole lot like marijuana, in terms of those compounds. They're all over the place. And it's one of the nice, for the people in the industry, that is one of the magical things about the plant, it's got this wonderful capacity to make these really cool compounds in all kinds of combinations and there's lots of industrial applications of those. And I'm personally really interested in that in my research, to try to figure out how we can benefit from that. But, we also have to be careful that when we do that, we do it in a way that is smart and it protects people in our society. Like I said, I think we can co-exist here, we just have to figure out a way that it can work.

Chad Whetzel – Are there any other questions from the members? Thank you very much. You gave us some light reading. Next we'll have Mark Lange, please.

Mark Lange – I work at the same institute as Dr. Gang, we're actually neighbors there. I don't have to give you my CV, because ours kind of looks alike, I think. In a number of ways we have parallel research programs. In terms of conflicts of interests, I work with

a lot of different companies and outlets. I've been an employee of some companies of various sizes. I consult a lot. The one that would be of relevance here would be Dewey Scientific. Jordan Zager, the founder was a former student of mine and as he and his associate Paul, started the company, they had a lot of questions about how you set up a company and the research direction.

So, I have consulted on that. In terms of what I want to talk about, is a little bit about what we do on when they try to learn how plants make various natural products or volatiles. And it's been mentioned that cannabis is pretty prolific when it comes to these volatiles. More than 200 were analyzed in one study that was mentioned and that is true. Cannabis emits a lot of different types of molecules. It's not just terpenes that are in the news, there are a lot of other things. One of the questions that was posed by Michael Largent, one of the County Commissioners here, is there something specific about cannabis that makes it different from other crops that we grow or other emitters that we're exposed to. And in terms of the different types of chemicals that it makes, it's not that unusual. Plants use volatiles to communicate. Almost all plants emit some kind of volatile to either attract pollinators, to communicate with other plants, to make sure that other plants or animals don't get too close. In some cases its defense, in some cases its attraction. So, the fact that volatiles are emitted is not very unusual. So, is the odor of cannabis unique? And the answer is, yes. If you ask humans or dogs that have been exposed before, if they can recognize the smell, they will. In airports or anywhere else, it is a unique smell. So, the cocktail of chemicals that we associate with most of those cannabis strains, is something that dogs and humans will recognize. So, there is something that is somewhat specific about that. Now, are the concentrations of these volatiles in cannabis extremely high? It's hard to tell. Conifers have been mentioned and what you have to realize is that with crop plants, you plant them very closely. So, the emission from a field of cannabis would be larger than the equivalent if it was just growing in a meadow by itself. So, obviously what you do when you grow crop plants, you kind of concentrate and try to get as many of them into a small acreage. So, in terms of fields, the emissions will be somewhat larger, as most of what we get from vegetation. But, if you look at Whitman County, we are actually the top emitter in the state of volatiles from plants. And I will reference one of those government reports that comes out every few years, to talk a little bit more about that. So, one important question obviously is, what is so objectionable about this smell for some people. The term skunky odor has come up and one of the questions is, do we know what this is? I would say, we do. You look at skunk secretions, there are two compounds and I'm going to give you a name and please don't cringe, one is called butene thiol and the other is called butanethiol acetate and that is what skunks spray. They are extremely odorous compounds and they will be active in extremely low concentrations. And that is important when you think about the nuisance issue. Not every volatile has the same what people call the odor threshold. There are some compounds that you can barely smell at high concentrations and then there are some that are just a tiny little drop and you just think, this is awful. So, they are very different in how they are perceived by us. So, the question is, do compounds like the skunky stuff occur in plants? And the answer is, yes they do. They are actually very common. Does anyone like Carona beer? I hope not, I think it's awful. So it comes in clear bottles and you should never

put a beer in a clear bottle. Beer needs to be in a dark bottle, because in a clear bottle UV radiation comes in and it makes a skunky flavor. So, that is why they don't want you to put this into a glass, they always give you a bottle and then you put a lime on top, so you don't smell it. So, these compounds are not just in beer, they've also been detected in wine, they're in coffee, and they are in olive oil and so on. They're not exactly the same compounds, but they're very similar. Now funny enough, no one's really looked into cannabis. Don't know why, but very likely I would say it's something like this that causes the skunky smell. So, it is something that is natural, it is something that is active at an extremely low concentration and that might be one of the reasons why people haven't seen it yet. You use a certain detector and it has a certain sensitivity for various different things, but if this is just a tiny trace, then you might think that little peek here is not prophetic, but in terms of the odor profile, it might actually be really important and just missed.

So, that brings me to just a comment about concentrations and doses, that we've talked about. Because in pharmacy school, the first thing you learn is, that everything is a toxin, it just depends on the dose. And that is, I think, a very important consideration here, what are the doses of these terpenes that you can expect to be emitted from either outdoor growth or indoor growth? And unfortunately there is very little publicly available information on that. Not even in Colorado, where this has been going on for a few years. There has just not been a lot of research that has been done. So, in some ways we're really, we just don't know.

So, for regulation, there are a few considerations. One of them would be health and that has been talked about a little bit by some of the other speakers before me. The question would be, are there potential health issues that are volatile related when you are growing cannabis? And at least from a regulatory point of view, none of the agencies consider this a real issue. So far it's missing entirely from any of the regulations that people go through when they license their operations. But, what is also important in context, not just the dose, but also the context. So, what do we regulate and what is important there is the emission inventory that the State releases every few years. And what's in there are things like, industrial emissions, gas stations, vehicle exhaust, road dust, construction dust, agricultural burning, fuel used for heating, residential wood combustion, structural and vehicle fires, livestock emissions, natural and biogenic activities, trees, shrubs, soil, those kinds of things, wildfires, agricultural activities, fertilizer applications and so on. So, if you try to put the volatile release from fields into perspective, then you have to compare this with some of the other activities that are important. Particulate matter is one of the ones that people are particularly concerned about, so those are very small dust particles. Whitman County is by far the highest in Washington State when it comes to small dust particles from agricultural activities. That's due to tilling, harvesting and so on. That's seasonal, but the total amount of matter that is released into the air is over 15,000 tons. Then fertilizer and pesticide applications, again Whitman County is the highest in Washington State, of all the counties. So, we do have airborne concerns with various activities that we have to take into account. So, in a way we're really lucky that we don't have any large industrial emitters, maybe the paper mill down in Lewiston, you can occasionally smell that, but

other than that, we don't really have very much. But, agriculture does obviously have an impact. Then the question is, would cannabis fields have a similar impact, potentially on the air quality? And I would say that depends on the acreage. If everything that is planted here is cannabis, then we would very likely get to concentrations that are relevant, even in comparison to wildfires that have increased in recent years, agricultural activities and so on. But that really depends on the acreage.

So, that gets me to the last part and that is the nuisance issue, because that is different, that's much more difficult to define. Even when it comes to health issues, there is a lot of ambiguity, as we've heard. But, when it comes to personal preference, it's almost impossible to get to an agreement. Some people think essential oils are the best thing ever, they love them and other people just think that it's very discomforting. So, there is a little bit of regulation around what the distances are between operations for cannabis and certain restricted entities, like playgrounds and schools and those kinds of things, but other than that there is not much at this point. And it often comes down to local governments to make those kinds of decisions and I think that is where you are right now. So, in a way Spokane could serve as an example, because in both Spokane and Spokane Valley, people have gone through the process before. In terms of the number of operations, it's an order of magnitude larger than here or more, so I think that is something to look at.

And then the last issue that I just wanted to mention, came up in Dr. Gang's talk, and that is hemp. Hemp is something that has been legalized in the last farm bill. In terms of the volatiles, in general it tends to be lower than the strains that are used for marijuana. Primarily because people just associate that pungent smell with more activity. So, if you want to get high, you're really looking for something that gives you a little bit of bang and when you're interested in fibers that is actually not any of your concern. And a little bit of breeding that has been done, in Kentucky, they've actually tried to get rid of any of the smelling compounds, because they are not related to the fiber quality, so that is what you want from hemp. You want to make sure it's something like this. So, it is something to keep in mind, but I think it's also a real opportunity for research and maybe go in that direction and take out what is so smelly in the marijuana.

I think I will leave it at that. I would be happy to answer any questions.

Chad Whetzel – Are there any questions from the Board? Thank you very much, we appreciate it. I believe the last for the Professors is Michael Kahn.

Michael Kahn – I'm a Professor in the school of Biological Chemistry as is Mark Lange and David Gang. I also until a few years ago was a colleague of John Wyrick's in the School of Molecular Biosciences. My history includes support by, currently I'm the director of a NIH training grant at WSU and I have a grant from NSF to study nitrogen fixation in alfalfa. I work on nitrogen fixation, I don't work on these compounds, but I'm sort of in the position, I think here, of being somebody who is scientifically literate and I came to this meeting a month ago and it sounded to me like you guys were having some trouble sorting through some of the science. And so I came back. I do know

enough to read this stuff. The figure that I've shown you is actually, I think, the first figure in the first paper that Dr. Gang gave you. It's the paper from Denmark in which a cow or cows were put into a Plexiglas box and exposed to either oregano or caraway essential oils for 9 hours. When I first saw this figure the first thing that struck me was how high the bar was for the morning milk. So what happened here was, they would milk the cows in the morning, they exposed them to the essential oil, they would milk them in the evening and then they came back and milked them the next morning. So that was the next morning's milk. So, what you can see there is, as David described, the levels of the essential oils go up, but they go up from a pretty high level already. There are terpenes in whatever those cows were eating that were pretty substantial. And in fact, when you look down at the bottom, you can see the letters "ns". That refers to the differences were not significant statistically. There are differences in level, but by the criteria that these guys were using, there was not a statistically significant difference. I don't mean that there was no difference, okay, but they were using a particular criteria and declared for the caraway oil non-significant and the oregano oil they said was significant. And they compared respiratory conditions with actually pumping the essential oil into the cow's digestive tract to see how that worked. And what you can see is, yes it goes up but it comes down again. So, this is a very transient sort of thing. Terpenes are common, you've heard that from several people and what you haven't heard are the abbreviations GRAS, generally recognized as safe. Many terpenes, in fact I don't know that there are any terpenes that we're talking about here that are not on this list. This list, a lot of compounds, the FDA does not regulate, because they are essentially grandfathered in. There is an industry group that essentially looks at the safety of these compounds and so this is the group that essentially says you can put mint in your toothpaste, you can put lemon oil in something that you want to rub on your chest. You have terpenes in your life all the time. And for most people those give a kind of pleasure. If you took the myrcene out of oregano, you might find that it was not something that would make a good pizza. These things are very, very common and are used by a lot of people. They haven't be subjected to the kind of study that one might do for some novel anti-cancer drug, but that is because they are generally recognized as safe. Now David has raised the point that for some people these might not be safe. There may be allergic reactions, there may be other things going on, but if you go buy cough drops, you're going to buy essential oils, imbedded in the candy, okay. So, just recognize what we're talking about, we're talking about something that you actually have a lot of experience with.

On the second page here, is a list of things that are found in cannabis, and unfortunately it didn't print out very well. Exactly what we are talking about is not readable, and I apologize for that, but there is an extensive list of things that you would eat that have some of the essential oils that we're talking about today. There are not essential oils that are unique and as was pointed out earlier, the THC, the psychoactive ingredient that is most important in defining the difference between marijuana and hemp, is not volatile. It is not something which is an odor hazard. I think Mark Lange pointed out that in the discussion last month, Commissioner Largent said it's not your job to look at the safety issues unless there is a safety issue. That is, you're not being called upon to make a judgement about whether limonene is safe or not. The

Department of Health, OSHA, those kinds of agencies do have certification processes for looking at these compounds and the first speaker pointed out that these things that are being talked about are not on the list of hazardous compounds. The point is, your job, I think is to look at, at least the way I interpret what Dr. Lange and Commissioner Largent said was, your job is to look and see if some of the things that are in these volatiles are bad and if so, figure out how to regulate them. There is another task that Mr. Whetzel brought up, that if you're going to be processing these things, there are chemicals you use for doing the extractions and so forth, that have to be regulated by themselves for whatever hazard they are. If you're a firefighter you want to know if they are doing butane extraction in there. Just as you would want to know that somebody has a propane tank attached to their BBQ grill. Those things come under a category of, is there a special need to regulate this. In fact, a point that Mark made and I would like to emphasize it, is that, and I've talked with a number of people in the industry, cannabis is cannabis, but hemp is now legal. If you've got lower than a certain THC concentration you can grow hemp. And in this area farmers are looking for alternative crops. The standard cropping system in this area is you grow wheat, when I first moved here you grow wheat for money, and you rotate to something else to get rid of the diseases that are going to cause you trouble. We now have crops that can produce as much cash as wheat, like chickpeas. But hemp is likely to be a decent rotation crop and you can take that as a plus as this is something that gives value to the local farmers. You can take it as a minus if there is a hazard as Dr. Gang pointed out. We may be talking about a bigger acreage than what is needed to supply marijuana to the population in Whitman County. There are other uses for hemp and in fact, a lot of people are breeding like mad to get the THC content down in order to study other potentially interesting cannabinoids in these plants. Other interesting compounds in these plants. THC is a problem, it turns out you can breed it out relatively quickly.

Again, a point that I would like to make in response to Dr. Gang. He gave you the Material Safety Data Sheets, for a number of terpenoids. Those are based on the hazard of using those compounds in the laboratory primarily, and as Dave Gibney pointed out, 100% of something is not the same thing as 1% or .1% of it, in terms of things like explosion hazard. The MSDS I think, is not the appropriate standard. I think the standards that are used in looking at compounds for grass to be recognized as safe, are more appropriate because they are talking about small levels of additives to things and that is essentially what we're talking about in the atmosphere. These things are not going to be in really high concentrations.

To get back to this cow experiment, the amount of essential oil that was put on this sponge, if you bought it from Amazon, and I priced it out last night, would be about \$20.00. Its 2 ounces and Amazon describes that in the aromatherapy market as 2 huge bottles. And you can read what people say about it and in the descriptions of some of these essential oils, that people that are complaining, that are giving 1's instead of 5's, are typically complaining because that stuff is not strong enough. This is a really weak oil, they didn't sell me enough. One of my favorite things from there, the guy was saying that we use a lot of this, it helps us sleep, and it helps our dog sleep. I have a Shih Tzu and it apparently snores like mad and the Shih Tzu sleeps better when there's

essential oils in the room. It doesn't mean that everybody is going to sleep better with essential oils in the room, but it does mean that in contrast to the, there is no information. There is a lot of information and you can believe that if people didn't like having lemon or menthol or whatever, they wouldn't be buying it and it wouldn't be there. I happen to not like lavender. I would not buy something with linalool in it. When I say I wouldn't buy something that has linalool in it, you'd go linalool, what is that? Its lavender, okay. I just don't like the smell of it. But, that is a preference and I think that at the level of the Planning Commission, it sounded to me last month, like the question is, is this a sufficient nuisance for you guys to step forward and say, let's not do that. Or is this something that can be regulated in other ways, by setbacks or whatever.

I guess another point that I would like to react to, one of the reasons that the Europeans are quite knowledgeable about things like the high mountain meadows that their cattle are grazing on, is because when they want to create, essentially an Appalachian designation that this cheese was made in a certain region, they have to show that it's not just geographic, but there is something specific about that cheese that lets them keep other people out of the market. It's what if you were growing wine, it would be called Terre noire (?). We have regions in Washington State that are designated regions that you can grow and say, this is from the Walla Walla region for instance and that means something to somebody who cares about wine. So, it actually represents, in some cases, a value added, not a subtraction of value. Thank you very much.

Chad Whetzel – Are there any questions? I don't know if you have the answer to this, but, you were talking about the MSDS' and the quantities, I think most people understand ammonia is a very strong smell also, do you happen to know what the level is that it becomes an inhalation hazard at? Like parts per million?

Michael Kahn – I don't, but I think ammonia is a classic example of something which is actually fairly dangerous. And Anhydrous Ammonia is not something to trifle with. I don't think any of these things are in that category.

Chad Whetzel – No, but I was thinking of that more as a comparison...

Michael Kahn – There are recommendations about how much ammonia vapor fumes to be exposed to, I just don't know.

Chad Whetzel – I was trying to look for a comparison.

Dave Gibney – That is another thing that is used in households.

Michael Kahn – Yes, it is used in households and in fact there are hazards to using ammonia in households, if you've got bleach around. If you pour bleach on top of ammonia in your toilet, it generates some pretty, pretty bad stuff.

Chad Whetzel – The other question I had and I guess I had better preface this a little bit. Not my direct family, but my in-laws are all a long line of dairymen, so that is where I am

coming from in asking this. So, I'm a little sensitive to the dairy's, but you were talking about generally recognized as safe, that terminology. To me, generally recognized as safe and desirable are two totally different things. So, something can be safe but still be undesirable.

Michael Kahn – Absolutely.

Chad Whetzel – So, I guess to me when I look at this, my question in my mind is, yes it's safe for us, but is it desirable in a product, whether it's the milk or meat or whatever. So, that is something that we...you mentioned that whether we want to have this or not, it's something that I think, it's whether it's safe for the community, but is it also, not necessarily desirable, but is it going to have any conflicts with other things that we already have going on? We have to protect everybody, not just one industry. We have to protect the marijuana, if we go with that, and also the other AG that we have going on around it.

Michael Kahn – I hear what you're saying, you should go back to what Mark said, which is, concentration can be very, very important for things like flavor. A little bit of something can enhance flavor where a lot of it is not good. And that can include things that at high concentration are noxious, but at low concentrations, they may be components of very expensive perfumes. That's true okay. Small amounts of something can tickle your fancy. Whether that affects milk, in fact in this Danish paper, I don't think they actually tasted the milk, I don't, there was a lepto (?) component of, and you yeah that tastes like caraway.

Chad Whetzel – The part that I read I thought, and I will be honest, I didn't read the whole thing super thoroughly, it's a scientific paper and that requires some time, but from my understanding they did say they detected that in people that are sensitive. Like for me, I drink raw milk, because that is what I like. And so you can taste that. If you put cows on onions, if you put them on all kinds of things, you know instantly.

Michael Kahn – My wife used to say that when cows had been into their wheat, they knew it the next morning, no question about it. These cows, presumably are not going to be eating the hemp or the marijuana.

Chad Whetzel – No, it's not the eating, but it's the inhalation. As they were saying, if I understand the study correctly, they had a fistula into the stomach, so basically a tube into the stomach, and they just dropped a bag of it in there and there was basically no change in the milk if I understood the study correctly. But if they were inhaling it, that has more of a direct affect into the milk and I don't understand all of the physics behind it, but that is the way I read the paper.

Michael Kahn – In this table, some of the numbers are those fistulae cows, and yes the levels of the terpenes bled out.

Chad Whetzel – But not as drastic as just the inhalation, if I remember correctly.

Dave Gibney – Actually, if you take a look at this graph, the first column, there are two sets of three, one set is the caraway and the other is the oregano. The first column is the respiratory and that is actually the shortest column of each of them.

Chad Whetzel – When I read the paper that we were emailed, that's not the impression that I got from that.

Dave Gibney – That could be, but this particular thing, the one that is kind of noticeable is the lag is stronger when they put it in, whatever the difference is between the low and high duodenum is, it's the same with both. But the respiratory is the lowest column.

Michael Kahn – And the additional terpenes that were found when that level went up, were the terpenes that were consistent with the essential oil that was being used. The two different essential oils have different compositions. It made sense, but like I say, the first thing that struck me about that figure was how high the level of terpenes was to start with.

Dave Gibney – Yeah, one of the things that comes to mind is, that I happen to like blue cheese, but some people don't. The different flavors of cheese are good or bad or different flavors of milk or different flavors of anything are good or bad based on individual taste. Neither one is harmful.

Michael Kahn – Unfortunately this is characteristic of this sort of area that we're moving into, because marijuana has been illegal and because hemp, as a result, has also been illegal, there is an awful lot that we don't know. But a lot of that could be sorted out in the market place, rather than (*inaudible*), I mean if Cougar Gold has a problem with their milk, my guess is they would get in touch with the people that were growing hemp.

Chad Whetzel – I guess to me, the downside is, if they get to that stage and I don't care where it is, I mean my cousins are selling to a boutique cheese company in downtown Seattle. If they get to the point where their milk isn't done, they're not coming back, it's done, you lose everything right then. And I'm not saying that marijuana has no place, but I'm saying we have to protect all sides. It's not just one group or the other, we have to find something that works for everybody. My point is, generally recognized as safe is not the same as desirable.

Michael Kahn – No, but it does indicate that there is a lack of obvious hazard.

Chad Whetzel – Right, but hazard and desirable are not the same thing. I mean, like you said, some people like certain perfumes, I can't sit in a room with perfume, I have to leave. That's just me.

Michael Kahn – I just refer you to Dave Gibney's statement about blue cheese.

Chad Whetzel – Yeah. Are there any other questions? Thank you very much. We have one more guest. Josh Ashby, please.

Josh Ashby – I’m an attorney in Seattle with Lane Powell. I’m the Chair of the cannabis legal team. I’m also the Executive Chair for the State Bar Association’s Cannabis Law Section. I am also the Executive Chair for the NW Marijuana Legal Conference, which tracks legal developments both in the Northwest and abroad. I am here, I was invited to come to provide some information regarding legal developments related to cannabis. I do work with clients who are located here, who are both licensed or who what we call ancillary or auxiliary companies in the industry. So, companies that do business with licensed companies. I am not advocating for any of them, at this point. I want to just provide information to you and to that end I am more than happy to give you information based on what I have heard tonight, but I actually would like to offer to answer any specific legal questions that you have first.

Chad Whetzel – Are there any questions from the Board?

Brian Davies – I guess my question is, are other counties going through this right now? The entire State, and the State of Colorado and it sounds like a lot of the research has not been done and so there are not answers to a lot of these questions. And land use is probably one of the big ones. It’s obvious that that is our arena and I’m just wondering if there have been any decisions in Washington State, at the County level that could help us with our decisions about what we’re doing here tonight.

Josh Ashby – So, I would answer that in two parts. First is, whether there is a lot of new information or guidance regarding either the legislative process or codification, rules or case law. There is in fact a massive body of discussion, investigation that has taken place on the legislative history site. Regarding the science, I cannot speak to it. I’m familiar with it, I also have a background at the undergraduate level, in genetics and so I’m aware of how to interpret it, but I cannot speak to the science of it. I can tell you how, on the legislative and legal side of it, there has been huge amounts of investigation on the science, on the implications regarding land use, regarding property values, is huge. Most of the law, in fact deals with property values and that is a big one. There is a lot of information out there and so I can speak to that at length. In fact, I was very closely involved with the hemp legislation that was just, I drafted a large portion of it, in fact I was there with the Governor on Friday when he signed it. So, I’m very familiar with it, I’ve also been engaged by legislative bodies on numerous occasions to weight in based on my industry knowledge. In fact, I spend a lot of time talking with not only other States but with other countries, who are currently weighing in on this. And I can tell you that the reason the barrier is dropping, is not for lack of information or for lack of investigation, it’s for lack of evidence of a problem.

Brian Davies – The nuisance issue seems to be the biggest thing. And I guess my question is, what are other counties doing? Setbacks, is that how they’re controlling some of the issues?

Josh Ashby – So, nuisance is a difficult issue. It's a big one in a lot of areas, not limited just to cannabis. And there isn't an easy answer. Agricultural focused counties have taken an agricultural oriented approach, which is that we can't stem industries, we can't stem the economic benefit that these industries bring. And they see the value of where this is going. I can tell you, for example, that if you take the top 100 largest publicly traded companies, every single CPG company right now, is investigating the potential products that it is going to introduce. The question is not whether the industry is coming, the question is not whether the federalizing (*inaudible*) has changed on the hemp side, the question is whether Whitman County wants to participate in that or whether they would rather see it occur somewhere else. Which is a reasonable question and that's a question that you need to weigh in on. In terms of the safety, yeah there may appear to be, not a lot of it, but in certain studies, it is not however because there hasn't been the ability to research. In fact, in 2014 when the Farm Bill was passed, specific to research, states were allowed to adopt pilot programs. Washington adopted its own pilot program so that people could study the effects of the various active components and compounds of cannabis. And there is a lot of great information about that here tonight. Did that answer your question?

Brian Davies – Yes.

Josh Ashby – There is a lot here. I'm trying to stop from diving into it too much.

Russell Jamison – When you say legal questions, does that mean all? I mean, can I ask any kind of question about this and you're going to answer it?

Josh Ashby – Any legal question, yes, you are welcome. If I don't have an answer I will tell you.

Russell Jamison – Well there are some counties that have taken the position of making the marijuana illegal in the county, isn't that correct? After they have already had some growers that were there?

Josh Ashby – So, I'm speaking to cannabis, which I should explain contains both marijuana and hemp, is the terminology generally now that is the solution between the recreational side and what was previously called industrial hemp. Cannabis, there are counties yes, that have imposed certain types of restrictions. I can tell you that every single county that has adopted something like that, is currently in litigation. Whether or not those can stick around is an open question.

Russell Jamison – That was going to be my follow up question. If a county like ours decided to do something like that, where we already have growers here, what kind of a cost to the county to legally have those growers step away, would you kind of give us an estimate or idea, because I mean, certainly they're not just going to leave with, you know, especially when they've got investments and things like that. So, can you give us an idea?

Josh Ashby – That is a good question. And you would certainly want to ask that in advance.

Russell Jamison – Because, if we chose, let me finish, if we chose to do that, the public needs to know how much it would cost.

Josh Ashby – So, in terms of that analysis, I'm not a good person to do a valuation like that. I'm not an accountant that would be involved in that type of evaluation.

Russell Jamison – Just a ballpark would be fine.

Josh Ashby – It would be completely misleading if I attempted to put any type of sticker on it. I can say that one county that recently settled this issue, I think was absolutely floored, it was 10 fold beyond what they had anticipated, which is not to say that you cannot get an inaccurate number, but to certainly investigate it. That is beyond where I generally focus. There are transactions attorneys and there are litigators. I do not litigate, I'm not involved once it breaks out into a fight. I'm involved advising people prior to that happening, in order to hopefully avoid the fight if possible. And specifically regarding most recently, in the cannabis legislation, yeah it has been adopted recently or is being considered. In terms of counties, binding examples are actually on the litigation side, because there have been several high profile cases, including here in the 9th Circuit, all of which have failed. They were brought related to odor issues. Nuisance has to have an illegal tie-in to it and the footing just simply hasn't been there for people who have brought their odor claim, there hasn't been anything for them to claim on the property side. So, at this point, all of that has worked against property owners. In most places there isn't a lot of new case law that is emerging at the moment or high profile litigation underway, in part because of that. Tenth Circuit in Colorado had the most high profile case and it went to a jury in fact, and it went against the property owners who were claiming nuisance. So, that is on the case law side. In terms of value, the area of law that it regards is called "takings law" and it regards the value of property basically being stripped away from a property owner. If you lose the ability, whether it's to live there, because you can no longer live there or if it's commercial, because you can no longer operate your business. I can recommend a few accountants who could probably maybe offer some more clear guidance in terms of valuations.

Dave Gibney – Could you be a little more clear as to, you're saying that the owners of the property who brought the nuisance actions, generally lose or the cannabis growers who are alleged to be the nuisance, generally lose?

Josh Ashby – Yeah, I might not have been clear enough in terms of who is generally losing. It's not a general, it's one or the other, and it is an absolute 100% case of the property owners bringing the nuisance claims have lost. In every case that they have brought against a cannabis business. So, it's not generally, it's actually a 100%.

Dave Gibney – And I also think I heard you say something about a Washington County has settled something recently.

Josh Ashby – I don't know whether the details, and because I'm not an attorney representing either side of it, I don't know whether it has been made public. Generally with a settlement situation it isn't always public, in fact there may be a confidentiality component of it. Whereas with a county there are public records there and so beyond that, we might need to follow up on it. I think it will likely be in the news once it's public.

Dave Gibney – Which County?

Josh Ashby – I'm not actually at liberty to discuss that, I'm just saying that it has occurred. That was the question, right? That is has occurred?

Dave Gibney – Yes.

Josh Ashby – And have other counties dealt with it, yeah other counties have dealt with it. Have they been surprised? Yeah, they've been surprised. Do I know all of the details? No. Do I know that they were unhappy with it? Yeah.

Dave Gibney – The county government is not happy.

Josh Ashby – Yeah, they were not happy. I think, in that situation, they were misled a little bit by the facts.

Chad Whetzel – You mentioned that property values and people filing suit because they claimed that their property values had decreased, what became of those?

Josh Ashby – So the two most high profile cases at this point were directly related to property values. One down in Petaluma, just outside of Santa Rosa, California and the other in Colorado. Those are both cases that they lost, so they didn't in fact ever get to do the valuation part of it, which is usually the last step, the damages, so determining how big the damages are, because they couldn't find a legal basis for it. That said, I don't think that you asking the question is a bad idea. In fact, I think this is probably address whether or not you want Whitman County to have a piece of that pie or not and you may not. I can say that most of these discussions though, have until now focused around the recreational side, but the cannabis question is much larger than that. Hemp has been mentioned a few times. I'm not really sure that put in perspective, recreationally it would be a drop in the bucket as compared with hemp. I think in Washington we had something like 88-acres total canopy and if you add up all the actively grown recreational marijuana, I know in Oregon last year there were 20,000-acres of hemp. Based on the new laws we're expected to have something similar to that. The largest Agri-businesses in the country are investing hugely in this because of its value as a rotation crop, because of its value in the therapeutic values of the various substances in it. Which is beyond the scope of my expertise, but fiber at this point is really an afterthought. It has to do with several active substances in hemp. So, the FDA has already approved medications based on substances in hemp. Washington law specifically, in fact, they don't just track with Federal law, they are out in front of Federal

law and they say that we're only going to limit it to the extent the Federal law limits it. Federal law limits it, we're not even going to restrict it or deal with regulating it at this point. There are some other interesting things in regards to hemp and so there may be some points of interest here, which have to do with things like setbacks. So, if there is interest there, I can offer some information regarding how the state has dealt with it. They have, for example, completely abandoned the idea of setbacks.

Dave Gibney – What was the bill number?

Josh Ashby – SB-5276, HB-1401 was the companion bill on the House side and the Senate bill is SB-5276. It is NTIB, which meant that it need to be in appropriations which have occurred on Monday.

Keith Paulson – If we as a county was to make stipulations of setbacks and where we could or couldn't have these hemp and marijuana, would we be open to lawsuits from these people? Have you run across that?

Josh Ashby – I don't represent anyone at this point who is a hemp company in the County. I can tell you that if there are hemp counties, currently there is no way that they wouldn't probably take issue. Does that mean that it would go to a lawsuit? Not necessarily. Most people don't ever really want to see a lawsuit, particularly large businesses. They would rather work with communities that want them there. So, I don't directly work with any hemp companies in Whitman County.

Keith Paulson – Or cannabis, either one.

Josh Ashby – Cannabis, likely more so. I know that there are a lot of businesses already operating in Whitman County. In fact, I know that there are businesses, for example, that are located here based on the perceived friendly nature of Whitman County as far back as 2014. So, I certainly think that there are people who would take issue and would be disappointed by that.

Russell Jamison – We've discussed a little bit here with the Board with regards to the distance between a hemp field and a cannabis operation, but now because of the changes that have occurred just real quickly, I don't know if what we've been thinking will work or not, but my question is, is the state and specifically the Department of Agriculture discussed with you and the Governor with regards to distances between these two different kinds of crops, because we know that Whitman County, as it was stated tonight, will be a county that these plants grow well in. But, yet at the same time, we need to be careful about how we approach the distance issue and we're probably going to need some guidance here.

Josh Ashby – Frankly I think that is a great example of how you're an AG oriented community, because you're asking the right questions. That is what the questions probably need to be at this point. Yes, there was enormous discussion around this, because over the last 4 years, Washington has been dealing with this issue. In fact, as

a precautionary measure, in 2014 under the pilot program they adopted a 4-mile buffer which they had some leeway to adjust, in limited circumstances. The WSDA, who authored this portion of the bill said look, if somebody wants to provide scientific evidence, in fact this is not just the legislative history, this is the language in the bill, they said that if somebody wants to present scientific evidence that there is in fact an issue related to cross pollination or contamination, we will consider it. I apologize, I thought this was silenced, (his phone beeped) however, based on the fact that they think there is no evidence at this point they are not going to create a buffer, period. And that is what the language of the bill says. That is the WSDA who wrote that part.

Russell Jamison – Okay.

Chad Whetzel – Are there any other questions? I'm sure we will come up with a few more eventually.

Josh Ashby – I'm happy to be a resource to that and as the Bar Section Chair for the state, I spend a lot of time weighing in for various municipalities, counties and otherwise. Although I do work for people in the industry, I am also interested in developing it. Fair and balanced industry doesn't do anybody any good to run out ahead and have a problem later. Thank you for the invitation.

Chad Whetzel – Thank you very much. So, that concludes all of our guest speakers right now. We will try to keep this a brief as we can, because it is getting late, but if we have any public comments, we would take those now. If you have something that is prepared or something that you mentioned before, we appreciate hearing that, but for the sake of time, let's be brief about it and I would like to try to keep this down to 3 minutes per person. I guess we will start with anyone that was proponents of the marijuana or the cannabis plants. So, if you are a proponent and you would like to make a brief comment or question, now is your chance. No questions from the proponents? Okay, we'll move onto the opponents, if you have any questions about something that was said tonight please step up to the mike and state your name.

Stephanie Fosback – I had two questions, one of them came up earlier. I'll start with the legal question. I am not a lawyer, but I read the Op Ed in the Seattle times, which I still follow because I lived there a long time. And it's from Bob Ferguson, who is our Attorney General, and his quote says, and I'll basically paraphrase it, but we need to allow local government in our state to place bans and restrictions on marijuana otherwise we will come under federal scrutiny and we don't want to do that, in order to protect our marijuana legalization in our state. So, I don't know if the attorney that was just here wants to comment on that, but my impression from Bob Ferguson is that actually counties have the legal right and responsibility to regulate marijuana within the state law itself. And again, I'm not an attorney, I'm a physician, but I just wanted to see if there was something he wanted to say about that, because my impression as that actually you all do have the legal right and responsibility to regulate that if you want to. And then my other question was about the terpenes. Because they were talking about the parts per million and I was just curious if anybody could give me a sense, and I

actually asked the expert behind me, because I can't hold myself in long enough, if this amount of terpenes that people are getting exposed to in Spokane, what they were measuring in those facilities, would have been comparable to what those cows got on those sponge and it sounds like we don't know. And I stood up in front of you all many months ago saying we don't know, and I want to say that again, we don't know. So, I don't want to be part of an epidemiological study of how this impacts my family in many years from now. Thank you for listening to me.

Chad Whetzel – Thank you. I don't know that we'll get necessarily an answer. Obviously we have a lawyer here that has dealt with that stuff, but I think as far as whether or not we're going to be able to regulate something, is something for Denis Tracy.

Dave Gibney – I don't think that there is a question as to whether we can do some manner of regulations of marijuana or hemp, it's what will be the reaction of the constituents of whichever side or all sides who feel that they got a shorter deal.

Stephanie Fosback responded from the audience without the microphone.

Dave Gibney – Right, we have the authority to do what we're doing.

Chad Whetzel – Yes, but the general question is, what is defensible or not, is more for Denis Tracy.

Alan Thomson – I don't think that there is any question about it. If the Board of County Commissioners so choose, they can ban this. That is not in dispute, that's obviously not in dispute. That is their choice to make and what we are trying to do here is, gather enough information to figure out or to send to the Board of County Commissioners so they can make up their minds what they want to do about this. Whether we're going to regulate it or whether they're going to ban it, they'll make that decision based on what this Planning Commission gathers.

Dave Gibney – I'm not sure that they're going to have the authority to totally ban the hemp crop.

Alan Thomson – I'm not talking about hemp, that is a totally different ballgame. I don't know enough about that right now to make any kind of comment. We're just talking about marijuana.

Russell Jamison – I think you're totally right about them making the decision. I think the public really needs to understand, and it's been made pretty clear tonight, for landowners to have lost every case, this court is 100%, with regards to their complaints, that's a big statement. And if our County Commissioners choose to do, you know, not have it here, the county needs to understand that there is going to be a price that we will have to pay and how much is that going to be. We didn't get a dollar figure tonight, but I know that there is one rolling around and it's just not being said. I don't know what it is,

I know it will be a big number, because for every property owner that had a complaint with odor or whatever, health, to have lost, that's a big statement. Because I wouldn't want it next to my house, I totally understand you, but I also understand that if it was there, I probably wouldn't want to use my retirement to try and make it right, because I would lose.

Guy Williams – But he said that every case that was lost was because they were trying to prove a nuisance.

Russell Jamison – That's right.

Guy Williams – And that is a whole different perspective. Then in essence, if the County Commissioners want to ban it, completely, that is a whole different issue. Totally separate.

Chad Whetzel – Some of the things I've seen in some of the counties, if we decide to go this route, have done bans, not bans, but they've regulated it to the point where it's impossible.

Russell Jamison – Right, they could do that.

Chad Whetzel – I'm not saying that we would want to go that direction or not, but there's a lot of, everything from no regulation at all to a near ban, is what we're looking at.

Brian Davies – There are three decisions that we can make. We can regulate it and allow it, we can ban it all together, what was the third one, it just slipped my mind.

Chad Whetzel – Do nothing, let it go. Just let it go as is status-quo.

Brian Davies – The State controls the number of permits, correct? And we are at the maximum number of licenses for the county based on population, correct?

Chad Whetzel – That is for retail sales.

Dave Gibney – Not correct.

Chad Whetzel – That is for retail sales and what they said at I believe the last meeting, was that at this time the state was not issuing any more growing licenses, but the state has also changed their mind several times. So, it could go up, it may not, we don't know on that.

Dave Gibney – It's certainly not based on population.

Chad Whetzel – The retail sales, however is.

Dave Gibney – No, no.

Chad Whetzel – Yes.

Josh Ashby – Can I answer that?

Chad Whetzel – Yes, please.

Dave Gibney – That's why Pullman got five and Spokane had two, at the beginning.

Chad Whetzel – Just a minute.

Josh Ashby – There are no more licenses currently being issued, nor do they foresee issuing them at all, ever. In fact, right now they are exploring ways that they can reduce the number of licenses. So, not only is there a finite number, but that number is going down. They just completed, about a month ago, the first what they called their all state canopy survey, which is when I said the 88-acres, it's actually based on that, because although they've issued all these licenses, they don't in fact know actually how much is actually being grown. So, now they have an idea about that, they've figured out where they want to adjust the canopy. From an economic standpoint, people though are, state included, trying to balance the idea that they realize federal legalization is actually on the horizon, and Washington is, because we are one of the early state's to get a foothold position, because like apples, we're a state that over-produces. So, there is kind of attention there, whether we want to pull back the licenses or not. As it stands right now, however, they're talking about licenses moving around throughout the state.

Brian Davies – Like the liquor licenses, sort of? Or moving around the county?

Josh Ashby – So, it depends, if you're talking about retail, they're more geographically restricted. Producer/Processors, which are the only ones who would, for example, have an odor related question or contamination related questions or things like that, producer/processors however do not have that type of geographical restriction.

An audience member ask a question without the microphone.

Josh Ashby – For producer/processors, no.

Russell Jamison – So, a county that banned the production of cannabis, those permits that were in that county could move to this county, is what you're saying.

Josh Ashby – Yes, they can. In fact, the LCB, that is the Liquor and Cannabis Board, so they are the regulating authority on the recreational side and WSDA is going to be the regulating authority on the other side for hemp, so they share authority for cannabis in the State of Washington. The Liquor and Cannabis Board has moved around. They've thumbed their nose at counties in some cases, and said that they were issuing licenses anyway and I think that is a problematic position. They have softened that position and said, okay we're going to defer to the municipalities in some cases, but not in others. They have recently dialed that back a little bit more and said well we're going

to issue them anyway and sort it out later. It sounds like part of the end of the line, although we don't have the formal explanations. Part of the underlying reasoning may be that they don't want to dial back the canopy at this point, so they are just looking to just kind of preserve it as a bookmark. That said, now I'm weighing in on the personal opinion, yet you ought to be able to do what you want to do and you guys are the ones who are in the best position to look at what is right for this county, whether it's economically or whether it is what is fit for this county. What has Whitman County traditionally been focused on, what do you want to focus on in the future, so these are all relevant. There were several other quick questions that came up and I'll just hang out up here for a bit if there are other questions you would like to ask. Some of them I immediate answers. They're not biased answers, they're just factual.

Chad Whetzel – We'll get back to you here in a little bit.

Stephanie Fosback is talking from the audience without a microphone.

Josh Ashby – Do you want me to weigh in on the constitutional federal pre-emption? Regarding Attorney General Ferguson's remarks.

Chad Whetzel – Yes, briefly if you want to go through that. As quickly as you can, because we've got another question coming up.

Josh Ashby – Yeah, I think that he was saying exactly what I was saying, which is that counties ought to have the right to weigh in, no question about it. He's also weighing in on the pre-emption intention between Federal and State law. He's a huge proponent of state's rights and the local county municipal rights. So, he doesn't like the idea of restricting people from even being able to address the issue of whether or not they want to pass a ban. In regards to specifically hemp and cannabis, he's been a huge proponent of both on the hemp and the recreational side, for related reasons, which is, hey let's have some laws in place rather than simply having this relaxed market. People are growing this anyway and they're growing it out in the fields and they're already here, so let's at least extend our hand in controlling it. In my experience that is Bob's position.

Chad Whetzel – We'll get back to you, I'm sure.

Kris Johnson – I'm the Department Chair of Animal Sciences at WSU and I'm neither an advocate nor anti, but there are a couple of things that were said that my colleagues actually said that I think we need to correct. So, when this facility was going up, I was concerned more about the so called skunk smell and the fact that the WSU dairy is right across the street. In looking into it I determined, and the science that if an animal breathes, a cow breathes an odor and it gets into the milk because it gets into their bloodstream through the respiratory system and it gets into milk through the bloodstream. So, when I talked to Tom about it, he had made some measurements and the problem, as I see it, or not the problem, but the concern, is simply that the cows will be, yes there are terpenes in milk, there's always terpenes in milk, they're a naturally occurring compound, however they will be potentially exposed to higher levels of

terpenes than they have seen before. So, we understand that there are terpenes in milk as Dr. Kahn said, the terpenes have something to do with organoleptic properties of milk, hence the people in the Alps that graze their cows out on pine, with pine scented terpenes and they get their milk. Ferdinand's does not count on our milk changing in its composition, because our cows potentially are exposed to other terpenes. So, Dr. Kahn also mentioned that Ferdinand's might come back to their milk supplier, that's us, and say, hey we have a problem. That would be three years after the cheese was produced. So, our concern is not that this isn't a great idea, a great business, it's simply that if I can't sell the milk from the WSU dairy, we go out of business. Ferdinand's goes and finds milk from some other place and the educational and research experience of my department is a problem. Now these gentlemen have a great facility where they actually have the filters they need for all of the inside grow, so frankly my concern only is what the terpenes are for the outside and we don't have any scientific information to say that it is going to be a problem or that it isn't going to be a problem and we can't investigate that because of federal laws about research. So, that's my only concern. These gentlemen have been very generous in having conversations with us about how we can mitigate problems, but frankly our only concern is what we really don't know. And probably can't figure out until they get to open their operation or, and the other option we have right now, now that hemp is legalized, we might be able to use hemp as a proxy and then ask the same question, but not use cannabis. So, that's all I wanted to say, but again I'm neither anti, nor pro, but that was part of our concern.

Chad Whetzel – Thank you.

Dave Gibney – A comment there would be, if the farmer who is growing wheat in the same area were to be licensed and chose to use hemp as his rotation instead of chickpeas that would actually be an impact, whereas the internal processing and growing in a building that is probably filtered, isn't going to be anything.

Kris Johnson – It would be the same problem. So, the outside grow and you're actually right, a hemp field right next to us could be the exact same problem.

Dave Gibney – And quite likely, actually more likely, and it's going to be bigger if it happens.

Kris Johnson – Dependent again on the variety as Dr. Lange said, different varieties have different odor compounds. One other thing that I need to correct, just because I'm a faculty member at WSU, gentlemen the cows erupt (?) methane but their primary source of methane is that they breathe it out, so when methane is produced, it essentially goes into the trachea, into the lungs and they breathe it out, so please stop saying that cows belch methane all the time, they expire methane and it isn't re-breathing. Thank you.

Chad Whetzel – Come on up.

Carla Burton Keifer – And I know that these gentlemen have a septic tank, so my concern is my waterways are right below them, right past the dairy. So, my family's

farm and ranch is on Country Club Road and I'm past that on SR 194. So, my concern is their septic tank and I want to know where the waste is going to go. So, that is my big concern, because I have cattle and we have a farm.

Alan Thomson – I can answer your question. They're not allowed to put their wastes in a septic system. And we can regulate that.

Carla Burton Keifer – Can we regulate that, because that is my big concern and I want to see it?

Alan Thomson – Absolutely. The Department of Ecology does not allow that to happen in the first place. And we can add additional regulations to state that, if they were to do a conditional use. And I'm being hypothetical here, I don't know what their outcome is going to be, but we would regulate this, we would do a conditional use and that would be one of the conditions.

Carla Burton Keifer – Okay, as one of the farmers around there and I have cattle, I would like to see that, I would like to see proof of that, not have it all, just under the table.

Alan Thomson – The state does not allow them to put it into a septic system.

Carla Burton Keifer – But we don't know what they are doing with their waste.

Alan Thomson – Well that is actually regulated through Ecology as well.

Carla Burton Keifer – It's proven and regulated?

Alan Thomson – Yes, and I've got the sheets here that show you the language that Ecology always responds to on any of these applications.

Carla Burton Keifer – Because I am concerned about that one, because my grandson, who is 2-years old, will be here for quite some time, so there has not been the research, I'm wondering what's coming down the way.

Alan Thomson – It will be illegal.

Dave Gibney – And just as a point, we've moved well beyond the one company that wants to do a processing plant on Country Club Road.

Carla Burton Keifer – I know, but it came in so quickly and nobody really knew about it and they were going to, it just came in and it was put there, nothing was done or told to the neighbors out there. It was just brought in and done.

Dave Gibney – That is what we are addressing, but we're not talking about any single specific company or entity or location right now at all.

Carla Burton Keifer – That was my concern, because I'm a tax payer and my husband's family has been there a long time and that has been their farm and we're concerned about (inaudible) and I'm concerned about my cattle.

Chad Whetzel – Honestly, I understand your concern, but it's no different than any fertilizer plant, they have regulations, they have to adhere to them, if they're abusing...

Carla Burton Keifer – But there is nothing (inaudible)

Chad Whetzel – If a company is using some sort of a chemical, depending on the chemical and how it is regulated through the MSDS, they have to have containments for it and they have to prove that they have no leaching. It can't go into waterways, salmon rules, that is something that Ecology regulates very heavily and we will have ordinances, but the state is the one that takes the pressures on that. They are very particular on those sorts of things.

Carla Burton Keifer – I was just concerned because it was put through so quickly and we have not seen regulations and that is a concern.

Alan Thomson – There is a Washington Administration Code 314-55097, that speaks specifically about marijuana wastes. And Ecology follows up on that and every time there is an application and every existing business in Whitman County right now is subject to that as well.

Carla Burton Keifer – Okay, but this has been so quickly done and so quietly done that it's a concern.

Dave Gibney – Well it wasn't done at all, it hasn't happened.

Carla Burton Keifer – Well they're out there all the time.

Chad Whetzel – That is not our concern right now, what a single business, we're working on an entire code for the whole county.

Carla Burton Keifer – And I want to see a code.

Chad Whetzel – That is what we are working on and that is what we are here for. In the back, come on up and state your name please.

Gretchen Wyrick – So, my question is piggy-backing on hers. What has already taken place with the grows that exist and I think there is something like 13 grows. Are you saying that they don't put their waste into a septic system and if they don't, I would like to know where their water waste does go now? I'm not talking about some regulation change for the future, but can you tell us what is happening now?

Chad Whetzel – I can tell you right now from my position on Whitman County Fire District 12, we've toured a lot of these facilities and in these facilities if they remove any part of the plant, it has to go into a garbage can, be weighed and accounted for. It actually is pretty detailed. Everything is accounted for, they have certain processes for disposing that, such as mulching. It's not something that they just dump outside and nobody knows about. As far as the fertilizers are concerned, almost all of these systems are, you could consider them a closed system. The water goes into the tank, whatever fertilizer they are using goes into the tank, and it can't be back splashing into your water systems or anything. We've looked at the processes and some of the stuff that we've had at the last meeting, the state regulates all their pesticides, fertilizers, everything and most of that stuff, honestly, is as safe Miracle Grow. The worst thing that they have is some PH balancers, which would be no different than if you had a swimming pool.

Gretchen Wyrick – So, are these places being regularly inspected, currently or is that something that we need to change with regulation.

Chad Whetzel – Inspected in what respect?

Gretchen Wyrick – So, do they have someone from the County or the EPA going around to make sure that these places really are doing this on a regular basis?

Chad Whetzel – As far as I know for the waste products, that's through the Cannabis Board, I believe. And I could be wrong on that, but it's pretty, on our tour they were showing us, and I don't remember what it was, one of the guys pulled a leaf off of the plant, and as he walked out, there was a receptacle and he put it in there and the thing is weighed. So, they know, the state knows how much waste products they have, versus how much they are harvesting. It's pretty detailed as far as that is concerned.

Gretchen Wyrick – Thank you.

Alan Thomson – Ma'am, let me give you this. This is a letter from Ecology and this is actually the Orville Boyd Road application. So, this tells you what Ecology responds to and they are supposed to keep in communication with Ecology. If we create any kind of ordinance, we can act on that.

Chad Whetzel – Alan, can we hear you?

Dave Gibney – You need to be at a microphone.

Ginny Rumiser – You of all people.

Alan Thomson – So, that is one of the things that we are proposing right now and that would probably be something that we would consider doing, is putting that into an ordinance. But, Ecology monitors this and that is just the standard state response.

Gretchen Wyrick – So, right now, it's solely in the hands of Ecology, the County does not have any requirement.

Alan Thomson – Correct.

Gretchen Wyrick – So with regulation, I'm assuming that would change for the existing grows.

Alan Thomson – Well, no. So that is another question entirely. The existing businesses are probably going to be grandfathered in, because they were allowed under the regulations at the time. If we create new regulations, then they are grandfathered in, we cannot compel them, but they are still held to these standards by Ecology.

Gretchen Wyrick – Thank you.

Chad Whetzel – Benno, come on up please.

Alan Thomson – Ma'am, I need that letter back once you have read it.

Benno Mohr – So, this is a point of clarification. So just on the studies. I don't work with legumes or mice, I'm an internal medicine physician. So, terpene effects on lung functions, there was a study with health human volunteers with ambient levels of terpenes in a saw mill facility, where they did essentially a rotational study, so a blind study. And they look at lung function and they found that in normal healthy volunteers that they had, decreasing lung function. So, they essentially had an asthma pulmonary function profile with response to just ambient terpene levels in the air at the saw mill. So, it clearly has effects, right? A lot of them are irritants and Dr. Gang talked about allergic, so allergic and inflammatory disease mostly what you see in the literature is non allergic and inflammatory disease. So, people get sinusitis, upper airway disease and asthma. So, in terms of causality, the Canadian study that was looked and exposure to terpenes and asthma in children, from a causality standpoint, it's likely to be the opposite, so it causes upper respiratory or non-allergic rhinitis, which is from irritants. Rhinitis is the biggest developer or the biggest driver of asthma development. So, those things are looked to be causally related. So just in terms of health effects in humans and in addition to irritant dermatitis, or skin rashes from exposure to terpenes. In terms of ambient terpenes you see both of those things. So, clearly it has health effects in humans. The other one, the question was about industrial waste water and septic systems in Washington and the WAC, so looking at that, it looked as though the WAC expected that you regulate it on the County level.

Alan Thomson – No, that is something that Ecology is responsible for. The County is not responsible for that. That is the Department of Ecology. And when an application comes in, we send out the information to Ecology and Fish & Wildlife, etc., etc. That is the response to the SEPA, The State Environmental Policy Act. So, it's Ecology's responsibility and they will respond to the applicant, they'll cc the County. Mr. Applicant,

Miss Applicant, this is what you are responsible for, this is what you need to do, here's my number, call me and we'll talk. So, it's all on Ecology.

Benno Mohr – I asked the Ecology folks and they said it's regulated at the County level.

Alan Thomson – Well, you got the letters.

Benno Mohr – That is for the SEPA.

Alan Thomson – That is a response from the Department of Ecology Water Quality Division, which is a standard response. I don't know who you talked to at the Department of Ecology, but every single application has that response from the Department of Ecology.

Benno Mohr – Because it was the same with air quality.

Alan Thomson – It's not the same.

Benno Mohr – They said that it's related, I guess it was a response, but the responsibility was with the permitting agency, which I assume is you.

Alan Thomson – Air quality is also supposed to be the responsibility of Ecology, but they don't seem to do a very good job with that, with air quality. So, there are compartments in Ecology. One department is responsible for air quality and another is responsible for water quality. The water one seems to be tighter and more efficient. I'm not confident in them doing anything about air quality.

Benno Mohr – And the last question is for Mr. Ashby, who I understand is a very excellent lawyer, but do you have a financial relationship with, you've been council for (*inaudible*) some of the businesses here in Whitman County. Can you tell me what your relationship with them is now?

Chad Whetzel – Mr. Mohr, you need to direct your questions to the Planning Commission Board.

Benno Mohr – I'm just trying to clarify Mr. Ashby's conflict of interest, because I understand that, you have other roles in addition to that. I think that is an important thing to bring up.

Dave Gibney – I think he made that clear.

Chad Whetzel – And he did state that he had active roles with companies around here. So, that is the way I understood it and I'm fine with that.

Benno Mohr – That is all that I had.

Chad Whetzel – Thank you.

Dave Gibney – I would like to clarify one thing that I said. Is that the entity on Country Club Road has the legal right to grow marijuana before they came before us to do a zone change. The request that they came before us with was to change that to an industrial area where they would no longer be able to grow marijuana without the conditional use permit, which was their next step planned to go to the Board of Adjustment to get. But, the zone change did not occur, their rights as an entity to grow, remained as to what they were before the process started. So, that is what I meant by, this has moved on.

Chad Whetzel – Right, those permits are not what we are worried about. We are on opponents still. Let's get through that stuff first, please.

Jim Burton – I live on Country Club Road. I'm easily confused, I guess, because are we not talking that, that facility on Country Club Road, this is not what you're talking about, at all? It's still there and it's growth only?

Chad Whetzel – Right. So, they had brought a permit and they requested a change of land use there. And they have since withdrawn that. So this really is not about one facility in particular. Right now we are trying to come up with information to design a code to regulate and have marijuana in the county and work with the entire county the way they want it to. Whether that be we decide to not change anything, to eliminate it, or something in between.

Jim Burton – Okay. So it's very difficult for me to imagine eliminating anything. It will keep rearing its head if you say I eliminate it. The last meeting I was at, that we thought we were talking a permanent ban and we found out we got three more months and that was it. Legally we couldn't do what we were told that we could do. So, I don't want to eliminate anything, but I do think you people need to say, okay EPA regulates waste, okay. That is fine. But somebody needs to follow up and say okay the county needs to have a follow up on these regulating authorities. If you're going to give them permit to do it, somebody needs to say, are you doing it. It can't be just dropped. Someone needs to say, okay you guys have got to, as an example, filter the air. You're not going to filter a field of air, but you've got to have somebody some time step up to the plate and say, are you really doing this. Because the ball gets dropped so often and it just keeps, it rolls on and on and if you say, yes you can do this, then somebody needs to have a fall level and I think your committee needs to tell the Commissioners, here's how we're going to do it. You've got to have a follow up. Don't let this ball keep rolling and rolling. There is nothing wrong with doing it, you're concerned about what it's going to cost to say no, but you haven't addressed a follow up. That is my point. I would like you to suggest that you recommend something that makes it a follow up. Don't just let it mushroom.

Chad Whetzel – Thank you. Are there any other opponents? Are there any neutral comments?

Jordan Zager – Were you able to distribute this paper that I emailed you guys?

Katrin Kunz – Yes.

Jordan Zager – Okay, so I believe Katrin and Alan distributed a paper. I'm here to just contradict a comment previously made.

Chad Whetzel – Which paper was that?

Jordan Zager – It's titled "Terpenes from Forests and Human Health".

Chad Whetzel – Is that one that we got today?

Katrin Kunz – Yes, it was sent out today.

Jordan Zager – This is from the journal "Toxicological Research", from 2017. On the first terpenes easily obtained, sorry. We categorize various terpenes easily obtained...according to their anti-inflammatory, anti-tumorigenic, or neuroprotective activities. So if you turn to page, the second page...

Katrin Kunz – Jordan, just a second. Not everybody was able to print it out.

Jordan Zager – Okay. So it was on the second page. Studies in recent decades have demonstrated that terpenes exert anti-inflammatory effects by inhibiting various pro-inflammatory pathways in ear edema, bronchitis, so your lungs and chronic obstructive pulmonary disease, so your blood stream. This is peer reviewed and published research in direct contradiction to what has been said to you this evening regarding terpenes and lung path. That is all.

Chad Whetzel – Thank you.

Audience member started talking.

Chad Whetzel – Please no talking without the microphone.

Dave Gibney – To be clear, we saw papers on both sides of that already.

Benno Mohr – What I talked about was a functional study, like lung function, pulmonary function.

Chad Whetzel – Are there any other questions or comments?

Paul Mahalov – First off, I just wanted to thank all of the WSU faculty members who came tonight. It's really late and I understand that everyone wants to be home with their families instead of here. But, we have a lot of things to talk about. One of the things

that I wanted to bring up, was one of the concerns that this county is going to become a mecca or a center for cannabis agriculture. As a plant breeder myself, we invest a lot of time trying to make decisions about what plants go on what acres. And from what I can see, the cannabis industry right now is a very high value crop. Along with those high value crops comes with planting those in areas that can get irrigation. I think if this goes legal federally, you will see all of the marijuana go straight to central Washington where it will have access to the Columbia River or in Skagit Valley, where there is a lot of rainfall. There is zero chance that this county becomes a center for marijuana research and production. I shouldn't say research, that's actually what we want to do. We're here to really research the crop as a whole and not really turning this into a county that is a high producer, because that is just not going to happen. It's not high value enough, to be honest.

Chad Whetzel – Thank you.

Brian Davies – Is it likely that Whitman County will become more known or will adopt the growing of hemp as a rotation crop? That sounds like the bigger question that is looming on the horizon.

Chad Whetzel – I agree with that. Right now though, I don't know. We've got some stuff that we've got to look into. It looks like whether or not we regulate hemp in any way, we can't do if it's an agricultural product, that's an agricultural product. There may be some leeway to, depending on how the research comes out, whether we protect the marijuana grows we have, if that is an issue. That may be something that we can do, but beside from that, if it's an AG product, there is nothing to be done for it. And so we're focused on the marijuana issue, not so much the hemp. If that makes sense.

Brian Davies – No.

Chad Whetzel – The ordinance that we are working on is for regulating the growing of marijuana.

Brian Davies – What we are talking about is the current licensed operations in this County and whether or not we're going to allow that to expand or pull back.

Chad Whetzel – What the regulation is, that is what we're working towards.

Dave Gibney – There are no county level regulations at this time. And that is what we are talking about establishing. But, I don't see the long term ability to distinguish between cannabis sativa and cannabis sativa, hemp and marijuana. If we don't look ahead to what we're going to do, one side or the other is possibly going to bring a lawsuit and you're going to get into equal protection situations. I've lived in this county for 40 odd years and I've chosen to stay here, but every year I know when they start turning the soil up and every year I know when they start cutting the wheat and I live a long ways away from any one of those fields, but my nasal reaction happens. We need to do what we can, but we have to be fair to everyone, if we can.

Russell Jamison – I think your question is really valid. I think that the growers in the area are going to look at the alternate crop, especially because of the economics, the way things are right now. I know I'm getting off the subject here, but I want to answer your question. I am a grower of production AG. Certainly it is something that I would look into as a grower. I have to, it's survivability. When new technology comes in, you have to look at it to be able to jump on it before your neighbors do if you're going to stay in the agricultural game. What will happen in Whitman County? I'll be quite honest with you, agriculture has changed from small family farms like me into corporate board of director controlled farms. It's slow in entering this county, but it's happening all around me and when a new crop comes into production big corporate farms are not really going to have the county's interest at heart. And because of that, boards like this need to consider what we want to do, but to be all fair about it, just like we've shown tonight, the state is really in control. They didn't consult the county before they voted to make it an agricultural crop, they just did it and now how we're going to handle it is dumped on our lap. And I don't know what the outcome will be. We can make decisions here, do the best we can, but in a sense I know from my own operation I sometimes wonder who really is running the farm. Is it me or is it the Federal government or the State government with all the regulations? And this commission could come up with ideas and things like that, take your comments into consideration, but let's face the facts here, the county gets the money from the state to run the county and the state gets the money from the federal government to run the state. That's just the way it is.

Chad Whetzel – Is there anything else? When do we want to meet next?

Alan Thomson – A month from now. I'm contacting the Planning Director from Spokane County to see if he will come down next month and tell us about Spokane County's journey.

Chad Whetzel – So that will be June 5th.

Chris Boyd – I just wanted to ask what you were talking about?

Chad Whetzel – Oh, our next meeting will be...

Chris Boyd – No, I got that.

Chad Whetzel – Oh, okay I've got you.

Chris Boyd – I'm from Palouse. How many public comment meetings are we going to go through on this thing? Is there a plan on that?

Alan Thomson – Until we're done.

Chris Boyd – You guys know that this is just going to go on and on and on, unless you put a limit on it. I've been a commissioner too and I've been a planner and you have to

say okay we're going to take public comment. I think you've got a six month moratorium window, you better portion out what part of that you're going to take public comment and I wouldn't make it but a 1/3 of it, and then take the other 2/3 to write the rules. Because it's going to take a long time, you guys have got a lot of conflicting problems here. The whole hemp thing is coming into this. From my point of view, because I am not one of you guys right now, I see it's pretty simple. You've got nothing to worry about on the retail aspect, the state has already determined that. You have something to worry about on the processing aspect, what zone do you put it in? It's just another product being processed. And then you need to decide, is marijuana, hemp, cannabis sativa an Ag crop or an industrial crop. It's really that simple.

Alan Thomson – You going to write us up the ordinance, Chris?

Chris Boyd – Yeah. Because that is the facts, you guys. You can take public comment forever, but it's already laid out in front of you, what the decisions are. There are only three decisions. One of them is already made.

Dave Gibney – I'm pretty sure the industrial hemp decision is made, that it's an agricultural product for us also.

Chris Boyd – Oh, no, no, no. Remember the discussion about rape seed oil and canola oil, you bet you can say no, we've got too much terpenes coming out of this cannabis plants, so we're going to have to keep it away from things that are sensitive, like a dairy. We're going to keep it 3-miles up wind, I don't think you're going to get a lot of in fighting in the cannabis industry between recreational and industrial hemp, because the recreational people are going to protect their girls, their female plants, canopy colony. And you're not going to stop hemp pollen, it flies hundreds of miles in the winds that we have on the Palouse. Those recreational breeders just simple have to protect their own plants. Which unfortunately means that they use up hydro-electric power to run the damn lights, instead of growing it out in the sunshine. But in an efficient production of their product, that's where your other question comes in, are they manufacturing or are they farming, because it's getting a lot further away from farming when everything is grown inside of a greenhouse. All of it is artificial light, they're going to be filtering the air that comes in as soon as there is hemp planted in this state, up wind, they're going to filter it.

Dave Gibney – That's marijuana, but the cover crop, or the rotational hemp, in the wheat field is, we're not going to be able to say you can only do that in the industrial areas.

Chris Boyd – No, you probably aren't going to do that, but you can certainly write into the laws of your AG zone that because of the effects this may have on another agricultural endeavor, a dairy, which we don't have a lot of, but we do have the WSU dairy, that in Whitman County you can't have something that smelly, which is kind of ironic, if you've ever smelled a dairy. In as far as how much it taints the milk, you bet. But, you see what I'm saying, you bet you can say, it's an Ag product, the industrial

hemp, but it can't be grown this close to this Ag product, because of the effect and that dairy was already existing. Now on a personal level, I'd hate to see this county short themselves if there are licenses that want to move into this county. Write the regulations so that they are satisfactory. We still don't have a processor in this county and that is kind of silly, I mean we should, we just should. Because we have producers, not very many, I think there are only 8, is what we finally figured out. Thirteen licenses and 8 actually active. But I think that if you're going to have processing, I think that needs to be in an industrial zone, because it involves solvents and potential owners and things like that.

Alan Thomson – There are other possibilities of how to regulate that and that is why I think Spokane County's Planning Director is an important one. They do everything by a conditional use and they allow the Hearing Examiner to determine, so it doesn't even need to go into an industrial area, it's just a conditional use. So, that is one possibility that is out there in the State of Washington. There are other ways that other counties do it and I think we need to explore how other counties are doing this and then come up with an idea on how to do it here.

Chris Boyd – I'd never heard Hearing Examiner before you said it, about this other hearing for PNW.

Brian Davies – I'm under the impression that conditional use permits also come up for review every certain...

Alan Thomson – Well you can put conditions on it to address things like that. You can put a time limit on it or you could just, the thing with a conditional use permit is that it can be taken away from you if you're not complying with the conditions. That's the hammer and the Planning Department is responsible for that. So, we can check, we can have Environmental Health go in there from time to time to make sure that they are doing everything that they are supposed to be doing and if there is a problem, we try to work the problem out. So there is the beauty of having a conditional use.

Brian Davies – So there is the follow up.

Alan Thomson – So there is the follow up that the gentleman was talking about. So, that is all something that we can consider putting into the regulation.

Dave Gibney – One more comment and then I think we need to go on.

Chad Whetzel – Did you have something else Chris?

Chris Boyd – Well, yeah on this CUP thing. I think on the follow up that he was concerned about, is that, and he doesn't understand, and Chad you can really clarify it for him, that these guys that are growing right now, nuclear power plants aren't under the scrutiny that these guys that are growing right now are. I mean, they're doing this in front of cameras. There is no way to get anything by on the LCB. The County doesn't

need to be trying to add an additional police force to what the LCB is doing. But the conditional use permit, that is the beauty of it. If there are complaints and you find out it's violating the ordinance, you can shut them down.

Chad Whetzel – And that is true. These facilities are, the cameras are everywhere. You cannot walk on that facility without being on camera. They're just everywhere and the regulations are very strict on what they can and can't do and checking ID's to the point where, a lot of people don't realize there are several or there may be multiple owners within the same building. And you can't walk from one room to the next without going outside, getting your new ID and walking around to the other door and coming back in. So, yeah you are correct.

Dave Gibney – The thing that I was going to say is, I know we don't want to hear it, but there is no doubt in my mind that the moratorium will be extended at least once.

Alan Thomson – Yeah, I don't think we're going to get this done in the next three months.

Brian Davies – With the changes now in the Federal law making hemp an agricultural product, how is due process going to be served by that, with the other issue that we're talking about? Because it's the same plant.

Alan Thomson – The definition is not the same. So, the problem is, agriculture in Whitman County is a permitted use. We do not regulate it. If hemp is an agricultural product and that is how the State is classifying it, it comes into the same category as every other crop.

Russell Jamison – That means we're going to have a lot more odor.

Alan Thomson – Yes.

Chad Whetzel – Meanwhile, we'll be back on June 5th, you said.

Alan Thomson – Yeah, June 5th.

Chad Whetzel – And you'll have the Spokane County Planner?

Alan Thomson – I'm hoping to. I haven't gotten a confirmation yet. I'll let you know. If not, we'll send you some regulations and we'll start talking about how we want to put this together.

Brian Davies – So we need to have public hearings with regards to the moratorium also?

Dave Gibney – We don't.

Alan Thomson – No, the Board of County Commissioners will, if they want to extend it.

Brian Davies – Are we required to have any more public hearings or are we required, how much public testimony?

Alan Thomson – These are not hearings, what we're doing here tonight, we're conducting workshops.

Brian Davies – Right.

Alan Thomson – So, it's up to the Chair if you want to have the public participate, which typically happens, then there is not a problem, it's a workshop. And we're probably going to have several more.

Dave Gibney – I would rather that we not ever have a time when we don't ask the audience if they have anything to say.

Chad Whetzel – Right and that is my opinion. We are them, their representatives and if we don't listen to them, there are times when it's not appropriate, but by and large, if you don't, you're an idiot. Anything else?

Dave Gibney – No sign of a special meeting, we don't have any ordinary business coming up? Zone changes and stuff?

Alan Thomson – No, we don't at this moment.

Dave Gibney – I move we adjourn.

10:30 p.m. Adjourn