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CENTERS FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

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MOUND WORK GROUP

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TUESDAY
APRIL 10, 2012

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The Work Group convened in the Brussels Room of the Cincinnati Airport Marriott, 2395 Progress Drive, Hebron, Kentucky, at 9:00 a.m., Josie Beach, Chair, presiding.

PRESENT:

JOSIE BEACH, Chair
BRADLEY P. CLAWSON, Member
PHILLIP SCHOFIELD, Member*
PAUL L. ZIEMER, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
ISAF AL-NABULSI, DOE*
TERRIE BARRIE*
ROBERT BARTON, SC&A*
RON BUCHANAN, SC&A*
MEL CHEW, ORAU
SAM CHU, ORAU
JOE FITZGERALD, SC&A
DEB JERISON*
KARIN JESSEN, ORAU
JENNY LIN, HHS
JOHN MAURO, SC&A*
ROBERT MORRIS, ORAU*
JIM NETON, DCAS
JOE PROVECCHIO, SC&A*
JOHN STIVER, SC&A
BRANT ULSH, DCAS

*Participating via telephone

C-O-N-T-E-N-T-S

P-R-O-C-E-E-D-I-N-G-S

(9:01 a.m.)

MR. KATZ: Good morning everyone in the room and on the call. This is the Advisory Board on Radiation and Worker Health, Mound Workgroup. Let's get going with roll call. And we're speaking about a site so please speak to conflict of interest as well when you register.

(Roll Call)

MR. KATZ: Very good, that runs through out list. There's an agenda for the meeting. For folks on the phone you can find it on the NIOSH website under the Board section under meetings. And there are also some papers associated with this meeting. Most of them should be posted and some are probably in the process of being posted, but they should be up there very shortly, if they're not already.

Josie, it's your meeting.

CHAIR BEACH: Okay, thanks, Ted.

Good morning, everybody. We do have an agenda posted, as Ted said. I'm going to just briefly go through it.

We're going to start with tritides this morning. Tritides, we're going to go ahead and have NIOSH present on them. I know SC&A had a paper ready, but the tritides approach has changed considerably, so SC&A's paper, I'm sure they're going to redo that paper.

So we'll have NIOSH go through, explain this new approach so that we're all understanding what's happening, Brant, on your side. And then we can ask clarifying questions. I think we are going to have to come back on tritides on a later date but we'll get as much information as we can today.

Then we're going to go into data adequacy and completeness, the internal issues, with radon following. I didn't put it on the agenda, but I do want to give the workers a chance to comment after radon,

before we get into Work Group recommendations. And then of course we'll schedule another meeting, because I would like to tie this up before the June meeting if at all possible.

I'm going to go ahead and schedule breaks at 10:30 and then lunch from 12:30 to 1:30. We'll try to stick to that schedule as close as possible so you can all kind of follow.

And then the last item will be Action Plans, and of course that's where the schedule will come in. So if you think of that and towards the end of the day that we can get scheduled before June it would be helpful.

MR. KATZ: Let me just remind, folks on the phone, I didn't say anything this time but I should. We have a number of people on the phone. Please mute your phones except when you're addressing the group. If you don't have a mute button then press *6 to mute your phone and then you can press *6 again to

take your phone off of mute. Thanks.

CHAIR BEACH: Okay. So, Brant if you want to go ahead and start on the Tritides White Paper that came out recently.

DR. ULSH: All right.

CHAIR BEACH: March 30th I believe.

DR. ULSH: Sounds right. This is a long-running issue, like all of the ones that remain. We've been discussing it for months, if not years. The specific issue that is being discussed here is tritides, which is a bit of an unusual form of tritium. We're most commonly familiar with tritium in the form of tritiated water, which is very mobile, goes anywhere in the body. Behaves just like water.

Tritides are a bit different. It's tritium bound to a metal molecule and to varying degrees it is less soluble than tritiated water. And it's also less mobile. And it comes in a particulate form rather than

a water vapor form. And that implies that there are some very significant differences between the two forms of tritium.

For one thing, we're kind of concerned about the most limiting case, the worst case, which is the least soluble form of a tritide. So what happens there is if a person were to inhale some of this it would stay pretty much in the lung. And the concern has been can you detect it with a urinalysis that you might use for a typical tritium program.

So that's the issue in a nutshell that we've been discussing for quite some time. NIOSH's initial position, and it's our current position, is for this particular tritide that we're concerned about the insoluble tritium. We know, from interviews with workers, we know who has been involved with working with this compound. It was a very small program.

I've got my visual aid here on the

table, but I'm not going to go into it in any detail. Those who were present at the meetings that we had in Germantown and in Livermore know how to interpret that. And I'm not going to say anything more about it.

We have had discussions about the scale of this program, or the activities with this compound at Mound. It was very, very small. It involved ten to 15 workers, we've provided a list of the workers involved. Now, that list of names was provided to us by the workers who were directly involved in the program.

However, the Working Group expressed some concern about people who were not on the list. People who might have come in to change the trash, service the equipment, do maintenance. Those kinds of activities.

So in response to that, and in response to a specific request from the Working Group, NIOSH examined swipe data. And the purpose of this analysis was to address

that concern about, well not necessarily for the people directly involved, the people that are in the list of ten or 15 workers, whatever it is. But these other people, maintenance people, technicians, whatever, what is their exposure potential.

And that is what this swipe analysis is meant to address. We presented an initial version of this at the Germantown meeting of this on January 6th. And in that paper I think we didn't capture all of the locations at Mound where work with tritides was conducted. And I think we also did not capture the D&D years.

So the Working Group requested that we expand that paper and make those two changes. We've done that. We've delivered it to SC&A and the Working Group, I think March 30th was the date that you said there.

The conclusion is that the doses are, they're trivial. They're in fact fraction of a millirem range, which is

basically what we heard in the interviews that we conducted with the workers. And by we I mean the Working Group and SC&A and us jointly interviewed the workers that were involved in this program.

And our analysis backs that up. This is a program where people were working with tritium, they were monitored for tritium. There are some challenges interpreting bioassay when this compound is possible.

But we've been told over and over and over again that this compound was never deliberately handled in the open environment. It was always handled inside double containment.

And it's a particulate tritium, it doesn't go everywhere like you might be thinking if you're thinking of a typical tritium gas or tritiated water compound. One of the workers involved was kind of incredulous when we asked this. And said you're asking me how much, basically how much

dust can get out of a tritium-tight glove box.

And it just doesn't make sense, because these particles are bigger and less mobile than tritium gas. So if you're working in a facility to try to prevent tritium gas from spreading all around it's really overkill for this kind of a compound.

So we've presented our analysis. Just a few minutes ago Joe sent out a piece from Bob Barton at SC&A raising some concerns about our paper. There might be a couple of mistakes, I don't know, I haven't had time to investigate that.

But that's where we are, NIOSH and ORAU, with the tritide issue.

CHAIR BEACH: I have a couple of questions. Just on this new paper I noticed that you did three interviews with health physics professionals?

DR. ULSH: Yes.

CHAIR BEACH: Are those new interviews for this particular paper?

DR. ULSH: Yes, the discussions themselves are new, but they're people that we've talked to in the past. And the notes from these interviews are in the SRDB, right, Mel?

DR. CHEW: Yes, they are.

CHAIR BEACH: Is there a number for this? Normally you list it in your paper.

DR. ULSH: Okay so what you're saying is that the SRDB number for the interview notes is not in the paper?

CHAIR BEACH: Well I was just curious if you had the SRBD number so we could go look at those.

DR. ULSH: If I don't I'll get it for you.

CHAIR BEACH: Okay.

DR. ULSH: But they are people, I mean obviously we can't talk about names here for Privacy Act reasons.

CHAIR BEACH: Oh, I know that.

DR. ULSH: But they are people

that, they're certainly people that we've talked to before. I think they're people you've talked to before as well.

MR. FITZGERALD: I suspect there's an overlap.

DR. ULSH: Yes.

CHAIR BEACH: It just wasn't clear from your paper if these were new or existing, that's why I was questioning.

DR. ULSH: Yes, the discussions themselves are new. As we went through this paper we had some questions, so we went to talk to those people again.

CHAIR BEACH: Okay. Work Group Members, any other questions for Brant at this time?

MEMBER CLAWSON: Yes, when you did these interviews did you ever think to call us in there? That we'd like to be a part of these, because we have tried over the years to be able to, so that we're not pounding on these people, everybody doing different

things. And so that all of us are hearing the same thing. I was kind of taken back and surprised because I hadn't heard anything about this.

DR. ULSH: Well they weren't official interviews. They were basically, since we've talked to them so often, we have working relations that we just picked up the phone and called them and asked them. I think you guys have talked to them in a similar capacity, maybe not.

So no, I mean we didn't. These people are known to you. If you want to check after you look at the interview notes, if you want to check with them feel free. Call them.

MEMBER CLAWSON: No it's. I'm not going to ask them a total different thing, Brant, I'm looking at so many times people just ask if we could all come in at the same time so they're not having to go through -- Because I didn't know who, I've got a good idea who they were with. It's just this is

several different sites this has happened for and I was just wondering.

MR. STIVER: Brant, I have a question for you. I noticed the first analysis you guys did seems to be more of a bounding demonstration. It was not really intended to be coworker model.

But just given the assuming 100 percent tritides in the swipes the highest possible factors contributing to dose in the model you were able to demonstrate in your paper, your claim was that these doses are less than a couple hundred millirem.

And the new model seems to be a more of a best estimate type approach. And I was wondering are you planning to use this as a coworker model now as opposed to a demonstration? Or is that still the intent?

DR. ULSH: The reason it changed approach, and you're right it did change, is because I explicitly asked the ORAU Team to do a best estimate rather than a huge bounding

over estimate.

As you know, it's kind of analogous to be over estimating strategy that we follow with the dose reconstructions. We'll start out, we'll overestimate it, we'll throw the kitchen sink at it. But that gives you a PoC greater than 50. Well you need to do a more precise and more best estimate.

And that was the situation here. I didn't want to get into a situation where we were using unrealistically high overestimates and then walk in with a dose of a few rem because that doesn't tell us anything.

So I instructed specifically, the ORAU Team to back off on some of these wild overestimates and make them more best estimates.

Now in terms of your question, will we use this for a coworker model. I don't know. That's more of a TBD issue that we'll have to talk about. My initial reaction is this was meant as a demonstration project

to give a best estimate of what the exposure potential to these tertiary people would be.

If we came out with a very significant dose estimate we would have a problem. That's not what we're seeing here. We're seeing fractions of a millirem. Or if Bob Barton is correct and we've made a couple of mistakes we're talking a few millirem.

MR. STIVER: Okay. You know, obviously we're just beginning to review this. So just the types of questions you'll probably hear from us today are more regarding clarification.

And one that seemed to really be a driver was a reduction and resuspension factor. The previous was three to the minus three per meter. And you went down to five times ten to the minus fifth.

DR. ULSH: Yes in the first revision we used three to the minus three, because we wanted to use the absolute highest resuspension factor, because we didn't want to

sit here and argue about what the resuspension factor should be. It's directly proportional, the doses that we estimate are directly proportional.

If you don't like the negative five number that we've used in the current White Paper, which we've provided the reference for. It's out of OTIB-70 I believe.

MR. STIVER: Yes, it was out of TIB-70.

DR. ULSH: TIB-70, yes. If you like a negative four number, multiply by ten. You're still talking a few tens of millirem.

DR. MAURO: Brant, this is John Mauro. I see you're using five minus five, regarding the resuspension factor, and I was originally the reviewer of the RF portion. So, I mean, I'm just looking at it purely as a resuspension factor. The only observation, I guess I have two observations and they're fairly simple.

You may want to consider that the

resuspension factor literature, that is the underpinning of your five times ten to the minus five, and I like the five times ten to the minus five number, when you're using it for total activity on the surface.

In this case, and this is just a thought to consider, what you're really working with is not the total activity on the surface but what you have to observe, as a swipe.

So you're really only looking at the removable portion of the activity on the surface. And, as a rule of thumb, as you probably know from Reg Guide 1.86, they make a distinction about a factor of five between when you're dealing total activity versus the removable material.

Just a thought, you may want to increase that five minus five per meter by a factor of five. And that would be compatible with the difference between total deposited activity and removable. One quick

observation.

The other one is a little discussion, here's where I'm a bit at a loss is all the literature on resuspension factors goes toward, I actually made a list of them, it must have been about 20 papers, going to the source documents in our White Paper.

And there is that enormous range that you correctly point out. And your three minus three was certainly at the upper end of that range. Well when you look at the data it's largely either plutonium, maybe uranium. There are some experimental work where they actually use some type of dust, where they were working with milligrams per square meter and per cubic meter.

Any thought to whether there's anything about a tritide, like a hafnium tritide, that is chemically unusual, I have no reason to believe it is or is not, where, for some reason, the literature that does not, of course, include tritides on resuspension

factor or anything about the chemistry and the particle size distributions, all of which I understand are areas that we can't go into.

But that's another thought that came to mind when I was thinking about your resuspension factor and the degree to which the literature itself, upon which your five minus five is based, is reasonably applicable to this particular chemical form of tritium, a hafnium tritide.

Those are my real, quite frankly, you know I read through your material and those are the two things that hit me right away. And you may want to give some thought to that.

DR. ULSH: Okay. Thank you, John. I appreciate your comments. With regard to the factor of five, you know, we could entertain, I'm not committing that we would increase it by a factor of five. But I assume that SC&A will be making comments. And we'll certainly give that due consideration.

I would point out though that even a factor of five doesn't increase the doses that we estimate to a level that I think would be of concern. And I guess it kind of depends on where we go from here.

At the end of the day, when the Working Group makes its recommendations, I don't know if you're going to ask for more work from us on this or if you're going to make a decision to move forward.

Well, certainly, if it's the Working Group's desire I guess we would look at whatever response SC&A wants to provide.

Now in terms of the second question, do tritides behave like whatever materials were used to generate the literature value of the resuspension factors? It's not an issue that we explicitly considered. It's not an issue that we explicitly consider in any other situation either. I don't know.

DR. MAURO: Yes, Brant, the only reason I bring it up is I think in every other

situation where we were using resuspension factors, I think it was plutonium, thorium and perhaps uranium oxides, and a lot of the literature itself is based on that.

So the source documents that are the basis for, for example, OTIB-70 numbers, where they're largely used at AWE facilities. You know we see that all the time so we know that the literature is in fact directly applicable to the circumstances we're dealing with.

Here we have a circumstance that is, as you pointed out correctly, is a little unusual. And quite frankly I'm thinking just about a metal tritide.

And for all intents and purposes, you know, if you're talking about halfnium or some of the other metals, if you just think about it as a metal, as a finely separated metal at a very small particle size, you know, five micron distribution or whatever, you know, intuitively one would say well why would

it behave any differently.

But I have to say I just don't know. And the degree to which we could be at least thinking about that might be helpful.

DR. ULSH: I'm with you, John. I just don't know if these compounds, these tritides are salt. That's what they are, they're salts. A metal combined with hydrogen. So I don't know if that means anything.

DR. MAURO: Exactly. And I understand what you're saying. So one could say, well it's just like any other metal. Yes. I'm not sure. I just don't know. Well the tritide is not, I'm maybe asking a question I shouldn't ask, it's not a hydrated thing like a hydrate. It's a hydrogen on the metal.

In other words the tritium itself is not HTO. It's T that's tied to the metal? Or you cannot answer that question.

MEMBER ZIEMER: It's not HTO.

CHAIR BEACH: I think Paul had a comment, John.

MEMBER ZIEMER: Well the tritium in a sense, in this case, for particle size considerations is trivial. So if you're talking about let's say iron oxide particles or halfnium, or any other metal, it seems to me it's the metal, it's going to behave like whatever that metal is. The presence of the tritium I can't see that that would change how the particles would behave in terms of resuspension.

DR. MAURO: Yes, Paul, my intuition goes in the same direction as yours on that. But I hate to just jump to that conclusion.

MEMBER ZIEMER: But I do have a separate question if I might raise it. My understanding is that the swipe samples, at the time that they are taken and even now, were understood to be just tritium wipes, not tritides, is that correct?

DR. ULSH: Yes, and that's really, it's an accurate assumption. And that was one thing that I was going to point out here.

MEMBER ZIEMER: That you're assuming, in your model, as kind of a worst case, that the swipes are actually tritides, is that correct?

DR. ULSH: We're assuming that all of the activity detected from the swipes are 100 percent insoluble tritides. And that is a huge --

MEMBER ZIEMER: Right. In reality it's almost the other end of the spectrum.

DR. ULSH: Yes.

MEMBER ZIEMER: It's probably all, or close to all --

DR. ULSH: Darn close to it.

MEMBER ZIEMER: But that raises the other question. Do you have some level of confidence that a swipe made of tritide versus that of normal formed tritium, which is just contaminated surface, would they look

different to a PC-3, or I guess it was a PC-5, or a scintillation counter.

I know that in the scintillation counter, and probably in the PC-3, you're still looking at, for the tritide, just the surface. And you had some discussion, which I didn't fully follow on how the counts represent the true activity.

DR. ULSH: Yes, exactly. You're talking about self-absorption really.

MEMBER ZIEMER: Right.

DR. ULSH: That is a topic that we were specifically asked to address at the Germantown meeting. So you did have a discussion of that in the paper here. Basically what happens is with tritiated water self absorption is simply not an issue. What you see is what you get.

With tritides, if the particles are big enough, there's a potential for some of the beta activity from the tritium, from the interior of the particle, to never make it

out of the particle and not be detected in a liquid scintillation cocktail.

So the question would be then, well how much of the activity are you missing? Turns out it doesn't matter. It simply doesn't matter. What is important is in the liquid scintillation cocktail, if you want to call it the apparent activity instead of the true activity, the apparent activity is what is important from a dosimetric standpoint, because if the tritium decay is at the interior of a particle and no radiation, no energy ever makes it out of the particle, well it's true it won't be counted in the liquid scintillation cocktail.

But it also won't escape to irradiate the lung. So it's not dosimetrically important. What we need to focus on is the apparent activity. And that is stated explicitly in the Mound Technical Basis Document. Not the one that NIOSH wrote, the one that Mound wrote, for stable tritiated

particulates. It's the apparent activity that is dosimetrically important. Did I answer your question?

MEMBER ZIEMER: Yes. That's what I thought you did. But I just wanted to make sure that we understood why that was done that way. And that the actual swipes were probably not tritides or if there were tritides it would be very small. I mean these things were opened inside the glove boxes, right?

DR. ULSH: Absolutely. Now it could have been a tritide, it could have been iron. It could have been rust. I mean there's a lot of metal equipment. But we're not terribly concerned about the rust, it's not one of the highly insoluble tritides. The highly insoluble tritides were handled inside double containment, inside glove boxes.

MR. FITZGERALD: Yes, I guess a couple of comments since there's a lull here.

(Laughter.)

MR. FITZGERALD: Just to expand a

little bit. The reason we're still talking about this, just going off your comment, Paul, is that in the interviews it became apparent there were, you know, as there are with handling tritium in glove boxes, there was a history of releases and that was acknowledged and not surprising either.

And that was where the concern over perhaps tritides being released with the tritium in this leakage and whether that would have been an exposure source. Not so much for the operator, since they of course were on bioassay, but for the support workers who many have been in the labs. That's where, sort of this has gone.

I guess my other clarifying question. We looked at sort of the previous version of the assessment and this latest version. I think you've clarified a little bit but I just want to make sure I understand.

The last version was a maximizing dose estimate. And, well, all the assumptions

were maximizing in terms of coming up with the significance, demonstrating the significance of the exposure source. This is also demonstrating significance of the exposure source. This is a best estimate.

So really it's the context of the review. I mean what in fact, what assumptions are selected and how one goes about that. But I mean the purpose is still the same. You're trying to demonstrate the dose significance, potential dose significance or exposure significance of the insoluble tritides, with these assumptions.

And I think you pointed out, and this is where I was trying to follow from before, that the resulting level would, at best, be millirem. And now you're saying actually with the best estimate it would be fraction of millirem. And it would have to be a higher level to be of consequence or significance.

I guess my question is what level

would it have to be if it were to be something that would be of consequence in this program. I'm just trying to figure out if it's not a few millirem or a fraction of millirem at what point, I mean, I think at the last meeting maybe Jim said this, if it were tens of rem, hundreds of rem, then we would have to address it. I remember that comment.

But now we're sort of in the minuscule range, but I'm just trying to figure out where would that have to be to be of exposure significance?

DR. ULSH: Yes, it's a tough question and I --

DR. NETON: Well I guess I might be able to kind of answer it. I think when I referring to this tens of rem or hundreds of rem issue had more to do with the significance of the overestimate. If you do an overestimate you get into the tens or hundreds of rems and you kind of have to like sharpen your pencil, so to speak, because you just

can't get away and say okay we can bound it and it's really high.

The extreme bounding estimate came out I think it was like 100 millirem or 200 millirem and so that didn't rise, at least in my mind, to a level of concern that we have a huge issue here.

As far as levels significant to where we'd include things in dose reconstructions I think we've drawn the line at a millirem. I mean anything a millirem or higher is going to go into a dose reconstruction.

So clearly if they get into the millirem ranges we would be including the potential exposure in a dose reconstruction.

MR. FITZGERALD: Now we're talking about the two analyses, one was a maximizing, maybe a bounding approach. And this is a best estimate approach.

DR. ULSH: Let me clarify that, because I know you're going off what I said so

it's really kind of my --

MR. FITZGERALD: Well I'm just saying the two papers have struck me, that was the context.

DR. ULSH: Perhaps I misspoke a little bit earlier. This is still an overestimate. It's just not as overestimating as the first one that we did. We backed off on the resuspension factor, as has been pointed out.

But as Paul pointed out we've still included some overestimating assumptions here. First and foremost, all the activity on the swipe is insoluble tritide. That's a huge overestimate. Especially when we know the operating history where this material was contained.

There are some other overestimating assumptions that are in here in terms of what percentile was picked. It's just that this is not quite as enormous an overestimate as the first one.

MR. FITZGERALD: I guess that's my point. Are we sort of in this scaling process where I could put a different group of HPs in the room and say I want a conservative construct on this, and by virtue of picking certain assumptions, because you really don't have any real data, so what you're doing is you're using these very conservative assumptions to try this.

So you're selecting these, whether it's ten to the minus fifth or fourth, you know, you're picking a number. And these numbers are cumulative, you know, when you add these assumptions together they'll give you a result.

And what, I guess just off the top, concerns me and this goes back to your answer, is that there's in a sense there's almost a target level of what would be considered de minimis in this program. And I think you're saying it's about a millirem.

And if we are simply playing a

numbers game where it depends on what assumptions you pick, and if you change those assumptions, and I think we had a, I don't know, couple hundred millirems CEDE to lung that probably equated to several millirem whole body, that would probably, that might actually fall in on what would be considered not a negligible exposure in EEOICPA. Here we've rejiggered the numbers and now it comes in slightly below a millirem, perhaps.

But do you see what I'm getting at? It sort of becomes this calculational effort. And the issue becomes one of whether one falls below or above a millirem as far as whether it's a dose reconstructable exposure. I think that's not a good place for the program to be when you're talking about something as significant as an exposure cohort.

So that's where I'm a little concerned about we're operating in an arena, we've had many discussions about this, where

we lack quantifiable data and site characterization data. So we're employing assumptions. And in this case trying to demonstrate the significance of an exposure potential.

But the implication of doing so is that we're trying to make a judgement as to whether that exposure potential is something that should be dose reconstructable under the program.

And my concern is that seeing the two, and these are two worthwhile efforts and actually I think I even told Brant I thought this latest analysis was a stronger analysis.

But nonetheless, it sort of brings me back to we could have a number of analyses that would give you a spectrum of assumptions that would be as bounding, I shouldn't use that word, as maximizing as the first one we looked at a month or two ago.

And perhaps with this one as the other bookend, and maybe with others in

between, but the implication is that perhaps some of them would make this dose reconstructable under EEOICPA, some would not. And I guess my question for the Work Group is it's sort of a policy question almost.

I know the one millirem has been used as a benchmark. But when it gets into a province where you lack real site data and you're employing assumptions, then my concern is whether those assumptions end up driving the consideration rather than the site-specific data which I think is the essence of the Act, that the site-specific data should be employed.

DR. NETON: Well where you're going though, Joe, is really how are we going to do a dose reconstruction, is what you're going to say.

MR. FITZGERALD: No, no. Not even that far. I'm before that. I'm just saying where do you have an exposure potential for which a dose reconstruction would be

warranted?

DR. ULSH: Okay. Let me clarify a few things. First of all I can't answer the how significant is significant. It's kind of like defining pornography. I know it when I see it. And I'm going to leave that question to the policy makers and the Advisory Board to deal with.

I don't consider fractions of a millirem significant. If you do, do something different than I would do. And it's not accurate to say we don't have site-specific data.

This analysis is based on swipe data from the site. It is based on resuspension factors from the literature. We know what material was there. There was a number of site-specific parameters that we have used here.

So we can talk about generalities all we want, but this is a specific situation at Mound and what we've shown you is that even

under the conservative assumptions that we've used here you're still talking fractions of a millirem. If you think that's significant and that's the basis for an SEC then you know what you need to do. I say it's not.

MR. FITZGERALD: I would tell the Work Group that that's not the issue. It's not the result that I'm dwelling on, because like I said I can get a number of HPs in a room, give them the task and we could come up with a number of results, which I think any one of which, including your own, you could substantiate. You could justify. You could argue that these were subjective but well thought out assumptions.

But what I'm saying is when you get into an arena where you're taking those assumptions to come up with a level of significance, as far as what is going to be considered in or out, because that's essentially what you're talking about. Is it a exposure that's going to be addressed or not

under the program?

Then I'm a little more nervous that the Act was written to deal with circumstances where, you know, your records aren't available. Your monitoring information is lacking. And even your surrogate information is lacking.

And I understand what you're saying, I don't want to bring the Work Group back through two years worth of debate on what site-specific information is.

But in this particular case we don't have the monitoring information. We happen to have tritium information but we don't have the ratios and what have you.

DR. ULSH: We do have monitoring information. We've got tritium bioassay and we've got --

MR. FITZGERALD: Let me finish, Brant. So really what I'm saying is if you had a result that gave you your several millirem, as the first assessment from January

did, where would that leave you? And that's what I'm concerned about.

If you had two assessments, one a little more maximizing than the other, just be perhaps more best estimate, and you had a range of values in between, where does it leave you in terms of making that decision on what to accept and what is the de minimis level? Is it in fact one millirem, de facto one millirem?

If it is then I think I would defer to the Board to say, okay, we have different ways to apply your assumptions and I think the calculational methods that Brant has laid out are fairly solid. But if we use different assumptions I think SC&A will provide analysis on those assumptions and the numbers changed, are we talking about that clean a threshold.

Is there that much confidence in these assumptions that you would deny or accept based on the difference between a

millirem or three millirem or five millirem?

DR. NETON: That's yet to be seen based on SC&A's analysis. I mean we're happy to look at the analysis you guys come up with and if it shows that there's a plausible upper bound of ten millirem, or whatever it comes out to be, we're happy to deal with that.

And I would suggest at that point the discussion points to the fact that it may be that high, we would include it in dose reconstruction.

MR. FITZGERALD: Well now it's ten. See I --

DR. NETON: I'm not saying it's ten. I'm saying whatever you say.

MR. FITZGERALD: I know but one millirem --

DR. NETON: One millirem will be included in a dose reconstruction, I can guarantee that. Anything over one millirem.

MR. FITZGERALD: One millirem?

DR. NETON: Yes, sir.

DR. MAURO: This is John. I'd like to jump in a little bit here. As I understand it the one millirem is a number that has come up simply because as a practical matter when you run your calculations and you're doing your dose reconstruction, per given year, and you find a dose of that particular internal or external exposure is less than one when I look at input it rounds off to zero.

So it's not that everyone agrees that one is the right threshold of no significance, it just turns out to be from a practical manner that's what happens.

And when I do my reviews of a case I will do the calculations and I'll see your zeros, a whole string of zeros. I'll check a number and say do I come in under one millirem and if I do I say okay, I agree.

I think that the more important question is, what I see here, is you have come up with a method to place a plausible upper

bound on the exposures to people from tritides. And if I was reviewing a case right now, with this methodology, what I would look at is two very important issues.

One is, I probably would not use your resuspension factor. I'd probably increase it by a factor of five and see what happens. And then I would make sure that whatever swipe data you have, that you're using, applied to the particular, had sufficient data that you could say I could, for the scenario, what kind of work the worker might have been doing over the course of a given year.

And if there's sufficient swipe data there and that it covers just about the full range of things that worker might have been involved in.

And in my mind, if you have that swipe data and it covered the range and perhaps you picked the upper 93rd percentile of that data, and that data did include all

the activities that he might have been involved in, and you use this what I would call a little bit more elevated resuspension factor, I would probably walk away saying this is -- and wherever the number came in, I would argue, this is just me speaking now, yes that's probably a reasonable upper bound.

Especially given the point that Paul just made that in reality the swipe data is probably not all tritides. It's probably, maybe dominated by tritium itself, tritiated water, we don't know.

But even if it were all halfium tritide I have to say, as a reviewer, of a dose reconstruction I would be less concerned if you came in less than one. I would say is this a plausible scenario and did you place a reasonable upper bound on the guy's dose given his work involvement.

And these are the two places I would look. One, the resuspension factor. And two, do you have adequate swipe data to

capture the full range of activities he might have been involved in?

MR. FITZGERALD: And, John, I would also add that some sense of the uncertainty, because if you're really trying, you know, there's been some terms here. Maximizing, best estimate and now we're using upper bound.

But since upper bound's the normal parlance, certainly the upper bound would need to consider the ranges and the uncertainties involved so that they could be accommodated in the upper bound. That's something that --

DR. NETON: Well that's one thing I was going to mention. Is we've been talking about bounding analyses here but honestly many times in dose reconstructions we will put a distribution in there for the dose. It will be the best estimate with some uncertain distribution about it. I mean that's often the technique that's used for internal dose in particular. But we haven't gotten that far

yet, that's something.

MR. FITZGERALD: No, this is a threshold question, really.

DR. ULSH: And I think it's worth pointing out here the context of what we're talking about. First of all everyone that we're talking about, all work with tritides was done in tritium areas at Mound. So any worker who would have been in these areas was already on tritium bioassay.

And you can argue about the interpretation of that, but we used 69,000 swipe data, these are site-specific from Mound. We're using tritium urinalysis data from Mound. We're here using site-specific data. Now the situation that we're talking about here is we already have an SEC for anyone who had any tritium urinalysis data up through 1980.

That covers the bulk of the time period that we're talking about. It doesn't cover D&D, but it covers certainly the time

period when active work was being done with insoluble tritide at Mound. So what you're talking about here, I mean if you decide that this is insufficiently accurate or for whatever unacceptable, what you're talking about is talking tritide doses away from people for which they would already be covered under an SEC.

CHAIR BEACH: That doesn't relieve us of the responsibility of --

DR. ULSH: No it doesn't, but --

CHAIR BEACH: -- sorting this out.

DR. ULSH: I think it certainly comes into play here because this is an SEC question. And what I'm saying is the SEC question for this particular group of people has already been answered. I say let us calculate the tritide doses for people who are not going to qualify for whatever SEC you designate.

MEMBER ZIEMER: You have another lull, Joe, if you want it.

(Laughter.)

MR. FITZGERALD: You want me to fill this one too?

MEMBER ZIEMER: We're pondering.

MR. FITZGERALD: No, I think again I don't dispute what Jim said. There's different flexibilities reported in the dose reconstruction process. But this is an interesting issue in the sense that what's being postulated is a threshold for even considering something for dose reconstruction. I mean it's almost not a dose reconstructability issue in a normal SEC sense.

It's sort of saying is this a exposure that rises to a level of significance such that we would even deal with dose reconstructability and the question of who to assign the dose to.

And right now, you know, I spent some time with the previous White Paper, I might add it actually came out about Thursday

last week. And it was sort of like, oh, okay I guess we're going to have to rewrite that.

But nonetheless having looked at it I think this is a stronger assessment. But nonetheless that issue remains that whereas that first White Paper one would have come up with, I guess, several millirem whole body or pick a number whatever it is. This one happens to have a more conservative assumption. It comes in fractions of millirem.

And that sort of got me thinking. So well, it's all in the calculations and what assumptions you employ, what uncertainties you include. And you can come up with almost any value depending on what kind of assumptions you take. And the question is which one is bounding.

Well I think that's a real good question for the Work Group because I think that would be kind of where we would have to come from in our analysis to say, okay,

stepping back from all of this in the end it's sort of, you know, we're doing a demonstration. We're not doing a dose reconstruction but a demonstration of what would be the bounding assessment.

Not necessarily maximize, but something that would reflect the uncertainties involved. And is that somehow going to fall above one millirem. I mean I think we haven't really broached this question of de minimis before. But I think this is where this comes from.

So from our standpoint that's kind of where we would go back and take a look at the numbers. And I sent you that response from Bob Barton just because that's sort of a late breaking, real-time reaction. But we're looking at some of these assumptions from the standpoint of the basis for the assumptions, the numbers. And we're trying to understand them better.

And we'll look at maybe what the

uncertainties that would be inherent in each one. But you know I think what we would come back with is some kind of validation as to whether or not in our view a bounding assessment of that results in a number fractions of millirem or something above a millirem.

But it still makes me a little nervous that really we're kind of playing in that field. That really we're not to a dose reconstructibility test, we're still looking at whether something is going to be in the game or not as far as exposure. So that's pretty much all we can go back an look at it.

MEMBER ZIEMER: That's more of a generic question than it is a decided, it's a policy question in part. And it, in a sense, is one you theoretically could face at any site where you have assumptions on what to include or what's trivial. I mean we have it at some other sites.

Some things that you say, you

know, the incremental addition of that to this total is so minuscule that it's not worth our time in doing it. And I don't know if it's always a millirem.

But you could in most cases you could take a millirem and put it in the IREP model, a year in time, and see what it does to the PoC if it effects it in the third or fourth decimal place, which I still object to even showing in some cases, you know they should round it off at least to whole numbers and maybe even fives. But that's --

MR. KATZ: I think the principle that the Board's been operating on and the program has been operating on since the beginning has been that if you're in a minuscule, I won't say what that range is, but a minuscule dosage range that it still would be accommodated by the conservatisms, because you're not ignoring any dose, even if you're not explicitly, you don't have a model or you don't have representation for that particular

dose.

But if you're talking about one millirem for something that you didn't actually calculate and you've already more than covered that by your dose estimate process in general then you're not spending the time taking it up. I think the program's done that in dose reconstructions.

DR. NETON: Yes I was going to say it's very common in the residual contamination group.

DR. MAURO: Yes, and Ted, this is John. What you explain is exactly what I'd run into where NIOSH in a dose reconstruction would say that we've checked these numbers, they're coming out less than one millirem and that's the end of the story.

I've seen places where they've actually run the numbers, came in at less and put zeros in, the IREP input and the attachment Appendix A. But I've also seen circumstances, which I've found favorable,

where they say we did the calculations, we came in at less than one and we were ignoring it. I've seen both.

And I would check both and in each case I'd left that as not a binding, in other words yes, I agree and the fact that you did not explicitly address it and put zeros in, the IREP input, I did not have a finding on that. I just simply concurred, yes that the number was less than zero.

And I seen circumstances where they've came in at 1.5 millirem or three or four. Checked the numbers and they're in there. And they're in the run. So what I think we have here is we're talking about a coworker model right now and whether or not we think one can be constructed.

(Simultaneous speaking.)

MEMBER ZIEMER: You're only using this --

MR. FITZGERALD: It's a demonstration.

MR. STIVER: Yes, we talked about that earlier.

DR. MAURO: Oh, okay. Well I may be jumping the gun. But I'm trying to see that we have a coworker model that in my sense I feel comfortable with. If that's not the conversation we're having then I may be off base here.

MR. FITZGERALD: No. I think you do, I think Paul might have touched on it. I think it's a policy issue as well as a technical issue. I mean, again, we can spend some time looking at the assumptions but I think there may be some policy implications.

And working at some of the other sites the issue does come up. And I think different tests have been used to determine whether or not the exposure is significant or not, I guess is the best way to put it. And that consistency of a policy application is something I guess it's the Board's province. And we won't go there obviously but we'll go

and look at the technical assumptions and come back with our best take on that.

But I still think there's another question and that's something the Board will have to deal with.

CHAIR BEACH: Well, Ted, I'm going to direct this to you. Joe brings up a good point on a policy issue where it's not just this Work Group, there are other Work Groups dealing with this exact thing. Is this something that we would transfer maybe to SEC Work Group to look at as a policy question or just take it out to the full Board to discuss during a meeting?

MR. KATZ: Well and I'm not sure whether it's so much an SEC issue as a dose reconstruction issue, in which case it might go to the Procedures Subcommittee, because if you are at this range you're not really having a debate about whether you're sufficiently accurate if you're capping it within, you know, whether it's one millirem or a fraction

of a millirem, you're not going to make a claim that this is not insufficiently accurate at that point, which is the SEC issue then.

I mean you're more, it's an issue of how are you handling it in the dose reconstruction. Like I said, I mean, I thought the way it was it was just basically these minor doses are assumed to be more than handled by other conservatisms. But anyway that's a policy issue and so the Procedure Subcommittee is one place to take it up.

MR. FITZGERALD: If I can expand on that though. I think the threshold value is one issue. But the other issue is the level of uncertainty involved in getting there. Because if you had a lot of quantitative data, and you are on solid quantitative ground, and you got to one millirem that would be one thing.

But if you are bereft of typical monitoring data or site characterization data that you would want to use, you would have to

use simplifying assumptions and whatever. That's a different issue, because the uncertainty range would make the one millirem less certain. And if that were the decision point one could argue that it may not be something you could hang your hat on as well.

So there's a judgement call I think that comes into play. It's not just looking at the one millirem procedurally but looking at what's the basis for deriving a value that would be compared to that one millirem.

And that's where I'm having some concern here, because I think in this particular case we really do lack a lot of the hard data. And I understand what Brant's saying, but I think this, in a relative way, we have less hard data on the tritides than we normally would some other source terms.

MR. KATZ: All I was saying is that if the uncertainty range though is a range that's from fractions of a millirem to a

couple millirem, that's a different circumstance than if the uncertainty range is fractions of a millirem up to tens of rem, then you're in this wild world of what's sufficiently accurate.

MR. FITZGERALD: That would be useful for the Board to discuss, because I think it is going to be a common issue, or has been a common issue. You know, looking at Los Alamos with mixed activation products, I mean we're talking about short lived, you know, you'd probably be fairly small for a lot of workers and that was a SEC, or still is an SEC discussion.

And what level of significance would you even consider MAT's to be something you'd want to dose reconstruct? Well, you know, so we're going to hit that in a lot of places.

MR. KATZ: So in another way it's sort of rubber hits the road, which relates to what I was just saying about where the range

is is health endangerment. If you're beyond certainty range keeps you within in the millirem and below you can't make the case for health endangerment, which is an element of the SEC.

MR. FITZGERALD: Well that's a new element.

MR. KATZ: No it's an original.

MR. FITZGERALD: A new implication. I'm just saying that I understood the one millirem to be more of a structural issue as far as what IREP can process it's not a health effects based. I mean if it was health effects it would be way up the scale from one millirem.

DR. NETON: It's not health effects. It's practical.

MR. KATZ: Right, I'm not questioning that.

DR. MAURO: This is John. This endangerment question has sort of been plaguing us for a very long time and I know it

is something that we really can't go to. I don't think we can resolve that. Quite frankly we've seen it too many times.

And I think in this case, you know, if that's where this is headed I don't think we're going to get to the end. In my opinion once you engage that question, we'd love to be able to engage that question to ask the second part. But you know we can't go, it's just not going to happen.

At the one millirem it just turns out to be, like you said, Joe, a mechanistic issue. The mechanics. And no one is troubled by that, the one millirem cutoff on IMBA. So really what I'm hearing is listen we don't know how much tritides are out there. We could make all of these assumptions without any real measurements whatsoever, of tritide levels anywhere.

And what's been done is almost like a think piece, what NIOSH did. It is a think piece here, let's just walk through this

and make this assumption, this assumption, assuming we've got thousands and thousands of swipe data under every possible circumstance, take the upper 95th percentile of that data.

And let's say if everyone agrees, yes, listen at 95 percentile there's no circumstances you could envision where anyone could have ever possibly been exposed at the 95th percentile all year long. You know, DPM per centimeter squared.

And then on top of that use an average annual resuspension factor that everyone agrees certainly on the upper end, what we have is conceptually. Conceptually approach that one side of the house could argue, well listen that's a health physicist thing. I have no problem with that.

On the other side of the house is hold the presses. You have no data. You know, we don't have one measurement of one tritide anywhere that we could even talk about. And that becomes the policy issue in

my mind. And there's a dilemma.

As a health physicist the logic sequence that you folks have gone through, Brant, I have to say I like. You know, with the caveats that I brought up earlier.

But the policy issue that you're doing all this without any measurements anywhere of any tritides, I can understand that also being what do you do about that within the context of this statute that we're working?

MEMBER ZIEMER: Well, John, I think you have to say if there were tritides in the workplace then the swipes capture them. You can't say there's no tritide. We don't know that it's -- I mean they're assuming it all is, but if there's some there then it's there.

DR. MAURO: Oh yes, I believe there is some there. But none were measured. I mean that's why I'm saying this is really not a scientific question.

MEMBER ZIEMER: They all were measured.

DR. MAURO: This is a question, you know, we have no data on what the levels were anywhere. Of tritides.

MR. STIVER: Yes, John, the problem is that there were tritides there it's just the uncertainty can range anywhere from zero to 100 percent.

DR. MAURO: Okay, that's the same thing as saying we have no data.

DR. NETON: I don't know why this is any different than the Class WYS --

MEMBER ZIEMER: I assume it's all the same.

DR. NETON: No we always pick the most insoluble material to maximize the dose. And we've been doing this consistently for ten years. So it's an insoluble form of tritium it's sort of like it's an X, you know.

DR. MAURO: Okay.

MR. FITZGERALD: Well I guess we

could pontificate as well.

(Laughter.)

CHAIR BEACH: So I want to ask Brant, would it be helpful for Bob Barton to go over his paper that he sent out this morning just for clarification?

DR. ULSH: It might.

MR. FITZGERALD: It's not even a paper, apologies to Bob, I'm sure he didn't realize I was going to do that. I think it would just be helpful if we were to talk about it, that Brant had it in front of him. I sent it out this morning.

DR. ULSH: We can at least get a head start on it, responding to it.

MR. STIVER: Yes, Bob got the spreadsheets Friday and he's had a couple days to look at it.

MR. FITZGERALD: We're talking real time. I sent it to Brant, I got it this morning.

DR. NETON: I don't think the

Board --

DR. ULSH: No, Josie sent it directly to me.

CHAIR BEACH: I have a copy of it.

MR. FITZGERALD: I sent a brand new copy to Josie, but literally I got it this morning about 8:30. So this is --

MR. STIVER: Yes it basically looks how the swipe data were used to calculate the annual doses. In some instances there was only about 167 hours worth of swipe data, basically one month, which was used for the entire year. So it's a matter of whether the doses really represent an entire year of exposure.

And, Bob, why don't you go ahead and take over here and just kind of give everybody and overview of what we've found so far.

MR. BARTON: Sure, thanks, John. As you just said, the issue that we found is in some instances the annual doses were

calculated based on less than a full year of exposure time. And just to kind of explain what I mean.

The original approach taken was to kind of separate these swipe samples into months so that you could take each individual month, put it to a distribution, calculate the mean and the 95th percentile and from that you could apply a breathing rate and an exposure time and you essentially get a total intake for that month.

And then you sum each intake for each individual month and you get an annual dose based on 12 months of intake. The problem came when you didn't have data for each month. For instance in a lot of cases they would combine three or four months just to be able to get enough data to fit the distributions of that.

The problem is they would combine three or four months, come up with an air concentration, apply a breathing rate. But

then apply only a month's worth of exposure duration. So a lot of times you would have, for a given year, maybe they would break it up into, well let's say quarters.

So every three months we're going to combine all the data, come up with an air concentration and then calculate an intake based on that. Unfortunately with the way the spreadsheet was set up it didn't take into account that now you have three months worth of data instead of one month.

Now this becomes especially problematic if you only calculate, you know, the 95th air concentration for an entire year's worth of data. Then essentially you're only applying an exposure times one month to the entire year.

And this was actually the case for the two most recently added rooms. There were two originally and two more were added in the most recent report. And the data that was found there again in a similar distribution

and the 95th percentile air concentration was calculated but were only applying 167 hours of exposure potential.

And basically what that does is if you were to scale it to a full year of exposure you're multiplying those derived doses by essentially 12, because you're extrapolating that one intake to a full year.

So essentially what we did was we took a look at NIOSH's most recent report and what they do is they set up sort of a case study in which they have a worker who's exposed two years. They assume the concentration they're exposed to are the two highest years that they have data for. And then they assume ten years after that two year exposure let's see what the doses are at that point.

And that's where sort of a fraction of a millirem came out of. So what we did is we went and we used the exact same methods. The same resuspension factor that

NIOSH used and we came up, and again, the dosage for, especially, the two new rooms increased by a factor of 12.

So essentially what the effect is is your bounding dose in this case study increases to about 3.7 millirem for one of the rooms. And I believe it was like 0.95 millirem when you consider the best estimate case. So that's really, and in this sort of systemic error in the spreadsheet calc it applies to both the most recent analysis and the one before that.

It's just a question of it was never taken into account if you're going to combine data for multiple months or say you only have data for one month, extrapolating that to what a full year of exposure would have been.

And also there's a second page to what was sent out. And that simply is in NIOSH's proposed case study, like I said they would use the air concentration for the two

highest years, when we went and looked at the spreadsheet we found that for a couple of rooms the highest years didn't seem to be correct.

So again, we mimicked what NIOSH proposed as their case study. Pulled out the data for the year that we found had the highest air concentrations, derived air concentrations that is, because this is based on swipe data.

And another factor to that was for a couple of the rooms the doses increased on them. But really the bounding scenario did not change.

So that's essentially what we found. Again, kind of a first crack at all of this. But that effect in the bounding cases that were identified you're essentially going to go by a factor of 12 if you extend it to a full year.

MR. STIVER: Okay. Thanks a lot, Bob.

DR. ULSH: Yes. Obviously we can't respond to this right now, but thank you for the heads up and we'll take a look. If we have questions I think the spreadsheets that you're talking about I think Sam is the one who constructed those. So if it's agreeable to you if Sam has questions figuring out what Bob did we'll just communicate with Bob --

(Simultaneous speaking.)

MR. STIVER: If the Board's okay with that then you and Bob can work this out.

DR. ULSH: Sure, we'll copy both of us and Joe so that everyone's in the loop. Josie, if you want to be involved we'll copy you too.

CHAIR BEACH: Sure. All right, any other clarifying questions or anything else?

MEMBER CLAWSON: I've just got one, because Brant made a comment earlier about that everybody was monitored on this. How many different people were on the tritium

bioassay?

DR. ULSH: Thousands. I don't know.

MEMBER CLAWSON: Thousands of people were on, thousands of different people were on the tritium bioassay?

DR. ULSH: Yes, because we went through the tritium urinalysis logbooks and counted, well we tabulated every name of any person who had left a urinalysis result. We did that in support of the radon class. It's thousands, tens of, well let's just stick with thousands. I can't say more specifically than that.

MEMBER CLAWSON: Well, you know, each one of us draw from our own specialities and stuff like that. And one of the things that struck me kind of interesting about the people that you interviewed here is that they are all health physicists.

You realize that going to people like that and asking them a question, they're

not going to say, gee, yes I really screwed up. We've found this is really a bad problem and go from there.

But the point I'm trying to get to is this. Earlier on you said that there was ten people that were involved.

CHAIR BEACH: Fifteen.

MEMBER CLAWSON: Fifteen people that were involved and they were monitored. I can tell you from my experiences that that usually is not all the people that had access into there.

DR. ULSH: And I'm not saying that it is, Brad. The ten to 15 people, well as you recall because I think you were in the interview.

MEMBER CLAWSON: We were involved in the interviews.

DR. ULSH: Yes. So that's the list of names that were given to us by the workers. And they were not all health physicists, one was. But we had production

chemists. I think, I want to say I think one of them was a rad tech but I can't say that for sure. But they were not all health physicists, they were production people.

MEMBER CLAWSON: Well I was just trying to say there's a lot more personnel that come into this picture, but they're not looked at the big picture. And to paint this picture that Mound was this robust and wonderful health physics program would be totally different than any other site that we've dealt with.

We were learning in this process. We were learning different things as we were coming into it. And I think there's probably a lot more involvement into it than what we figure.

But I've just watched some of the interviews that they're talking about in here. And in your conclusion of work practices, procedures and health physics program used at Mound protected against insoluble tritides and

the process in which it was encountered.

I can tell you today, even in today's we're still finding stuff that we never even figured. And what worries me partially in the D&D era is we've heard from numerous workers that it was just spot-checked people. Certain people had dosimetry, certain other ones didn't. Others were on the bioassay program. And they all weren't.

I just question how really covered they were, especially in the D&D era, and in the earlier years. It's just --

DR. MAURO: This is John. Brad's question, it brought to mind another issue that I just remembered that goes along with what Brad just brought up. When you use the resuspension factor approach it's always been my experience that what we're really with are, okay, these are the exposures from the stuff that's been deposited.

It's not apparent, from what I can tell, what do you do for people who were

involved on the operations period, where the exposure is a combination of material that might have become airborne due to direct leakage from whatever, a glove box or however it might get out, and in addition to what may have accumulated on surfaces.

It seems that the intent of a resuspension factor has always been mainly from the stuff that's resuspended and not as a way to come to grips to what exposures might be from this material that's directly injected into the air from a leaking source.

Is it your contention that somehow the approach that you've laid out captures both exposure scenarios?

DR. ULSH: I don't know. I'm thinking on the fly here, John, in response to your question. I can tell you that we know of a couple of specific incidents where particular individuals were exposed. And those were identified by Mound dosimetry personnel going back to look over the

urinalysis results for specific patterns that indicate exposure to insoluble tritides.

That's described in the McConville and Woods Fusion Technology paper and the doses are reconstructed for those accident type scenarios. All of the people that are on the list of ten to 15, were on tritium urinalysis.

I guess if one of those people were to become a claimant and file a claim we would interpret their tritium urinalysis data just like we do in any other situation, in the way that's the most claimant favorable.

So if they come in with a lung cancer we would calculate their lung dose based on their tritium urinalysis data as if it were insoluble tritides. If they come in with a prostate cancer we'll assume it's tritiated water, because that's what gives you the highest organ dose.

In terms of the support people that Brad mentioned and people that were,

perhaps, had access to these areas during the operational period, they would also be on tritium urinalysis. So I don't know.

DR. MAURO: I think you bring up an important dimension to the way you're looking at the problem. And that is you feel that you can parse people now. That where in some cases you are actually going to use the bioassay results for certain people where you believe that they might have been exposed to direct airborne activity that may have leaked out, and separate them from the people that you feel confident, no they only way they could have been exposed is from resuspension of deposited activity.

And that's a dimension of analysis that wasn't apparent from looking at your White Paper, if that's the strategy you're envisioning.

DR. ULSH: I think so. The White Paper was a specific response to a specific question. And that is, for those people not

known to be directly involved in working with this program, because remember even in terms of tritides the insoluble tritides at Mound that we're talking about, the one in particular, makes up a very tiny fraction of the total tritides that were handled at Mound.

And the tritides themselves make up a small fraction of the total tritium inventory at Mound.

DR. MAURO: Right. Oh no, I fully understand that. But what the interesting dilemma is, would that sub-population of people that you say okay, this group we're going to use the bioassay data. We know what's going to happen there, even if you assume the MDL.

Let's say here's a group of people. We have lots of great bioassay urine sample data on them, we're going to assume they were exposed to halfnium tritides and we're going to use one half the MDL for tritium and urine and you're going to come up

with this big whopping dose for the respiratory tract, we all know that.

And on the other hand those workers that were not involved in that but are going to be assumed to only have been exposed to the resuspended material, we know that they're going to come in really low. Perhaps below one millirem a year, depending on whatever.

But if that's the conceptual model of how you attack this problem I think it's important that we all understand it, if that is your strategy.

DR. ULSH: You put me on the spot and I'm going to roll the dice. I'm going to say that's it.

(Laughter.)

DR. ULSH: I reserve the right to change my opinion if I get caught in a bind.

MR. STIVER: And John Stiver. I might come to Brant's rescue here. I don't typically do this. But at our last meeting

there was a long discussion about this very issue. And the point being is that you certainly wouldn't use the bioassay data to model a stable tritides exposure, just for the reasons you've cited.

And that was part of the reason, at least my interpretation, as to why you chose a high resuspension factor on that first model was to potentially cover these situations during a period of time when there were direct injections or even fugitive injections that would not have been detected necessarily, as opposed to accident scenarios.

And I guess that was one of the questions I had about the new resuspension factor whether that really could be considered to be bounding for all, not just resuspension, but also potential maybe missed direct injection and what the basis for that might be.

Again, it'll be something that comes out in our analysis in the paper. But

it's something that kind of concerned me.

DR. ULSH: Yes, I think we specified in our latest White Paper what the basis for the resuspension factor is. Pulled out of OTIB-70 and I think you can look in OTIB-70 and see what situation that particular value applied to.

MR. STIVER: It's incorporated by reference in those?

DR. ULSH: Yes, yes. But if it's not clear let us know.

MR. STIVER: Okay. It'll be something, if it becomes an issue we'll bring it up.

MR. FITZGERALD: I guess I have just one comment. One thing I had a little trouble with in the paper, and maybe Mel or Karin can jump in on this. I have to confess the Department's treatment of tritides was just as I was leaving. I don't recall really dealing with that issue. I should have been dealing with it but I didn't deal with it.

And it just strikes me, when I read the paper where it's talking, I think Brad mentioned this, about the very good practices that were being applied. And I kept looking at the dates and, you know, the dates and relevance pre-dated, correct me if I'm wrong on this, predated the Mound TBD on tritides. You know, tritide management I think, which was in the 90s I believe. Mid-90s.

And certainly predated the Department's which was 2003 I think. So it was a late breaking recognition. And actually the Defense Board was mostly responsible for the Department coming up with its TBD in 2003 because they came up with a recommendation that this was a big issue.

And I don't have an answer today but I think I almost have to run this down. If, under this particular scenario, which is a pretty extreme scenario when you're considering all the contamination to be

tritide on a swipe. And you're talking fractions of millirem it almost begs the question so what was the big deal if in fact the site, the Department and the Defense Board all three felt this was such a compelling issue in terms of monitoring and dose implications.

So help me out on this. When you make the statement that Mound had it together in terms of its health physics management, this particular issue in the '80s, I just have trouble with that just because it looked like the recognition and the actual procedural response and everything else, the health physics response was in the mid-'90s and beyond.

And there was seemingly a sense of this was a big deal. And this conclusion not only wasn't it a big deal, it's hardly even worth dose reconstructing and also Mound had it all together ten years before everybody else, including itself, since it didn't issue

its own TBD until the mid-'90s.

So I'm just looking at this timeframe and trying to figure out these statements and how they jive with that history, operational history.

DR. ULSH: I can jump in a little bit and then let Mel and Karin correct whatever I say that's wrong. The actual date of the Mound Technical Basis Document for Stable Tritiated Particulates was January 24th, 2000. And I think that formed the basis for the later Department-wide, like 2003 or something like that?

DR. CHEW: Yes, 2003, 2004, somewhere in there.

DR. ULSH: Okay. My understanding is that the genesis of this when people started talking about these tritide issues was the 100 millirem per year monitoring requirement.

People realized that with these highly insoluble tritides if we based it on

tritium analysis we're not going to be able to detect 100 millirem per year tritium dose. That's highly unusual. I think that's the understanding that came in and resulted that regulatory requirement.

MR. FITZGERALD: 835.

DR. ULSH: Yes. Does that sound right?

DR. CHEW: Yes.

DR. ULSH: Therefore they started talking about estimating the doses or bounding the doses, I don't know if they used that term. But using not necessarily the tritium urinalysis data but on top of that we're going to do the lapel air sampling and we're going to do the swipe sampling because that give you the lower missed dose, for lack of a better term.

MR. FITZGERALD: So in a sense that statement that's in the White Paper is somewhat qualified for that recognition that more stringent controls were applied, if for

no other reason than to get below 100 millirem.

But I just have maybe some difficulty understanding the claim about the practice back when it was actually happening versus when all of these steps were being taken to make it more stringent. And I agree that was a main driver.

So yes they did have practices that controlled, they knew tritides were there. But the degree to which they controlled them perhaps wasn't nearly as much as they did ten, 15 years later when it became an issue of, administratively, they had to be able to measure more precisely.

And that's where the breathing zone samples, lapel samplers, I mean all of that came into being too. I'm just trying to understand that, rationalize it.

DR. CHEW: Joe, I want to answer, just to know your timeframe here. The program had a lot to do with this particular issue

too. I think without getting into the details the purpose of this particular tritide being formulated, compounded, it was important to follow-on programs into the system.

And we see that now at other places like Savannah River, Los Alamos. And at times early on, to go back, a little history, the only really metal tritide issue was with accelerator targets.

And we know what those in particular were. But this particular program, as everybody knows in interviews that you were also involved in, was very specialized and was for a specific need for part of the program itself.

And so when that introduction came into the program and the laboratories themselves realized that they're going to be using this at a greater extent then that's why they're much more conscientious of the issue here. And that's what the Defense Board wanted to do. And I think you knew that.

MR. FITZGERALD: Yes I do. And I still think there's a timeframe issue that we'll treat gingerly, but nonetheless probably treat to some extent in our analysis, because we have addressed it way back when but then we sort of went of into more esoteric things like dose calculations and haven't really gone back to the operational perspective. But at any rate I just get your reaction to that.

CHAIR BEACH: It's important to do that. So what I have for action items is NIOSH is going to provide the interview notes or the SRDB number. Of course Brant's not in here, but I'm sure Mel will help him out there.

And SC&A to review the White Paper and provide a report to the Work Group. And I think it's important for the Work Group members too to think about that policy question and if we want to go forward or make that part of our discussion when we report to the Board. So, something to ponder.

So let's go ahead and take our break now, between this and data adequacy. Take 15 minutes, Ted? Quarter to 11:00, that work for everybody?

MR. KATZ: Okay, so I'm just putting the phone on mute.

(Whereupon, the above-entitled matter went off the record at 10:26 a.m. and resumed at 10:42 a.m.)

MR. KATZ: Okay. We're back. Mound Work Group.

CHAIR BEACH: Okay, so we're going to go ahead and get into the internal issues, adequacy and completeness. It's kind of a three part discussion.

We're going to start with the thorium White Paper that NIOSH recently sent out. And then we'll move into an SC&A memo.

And that'll tie up some of the loose ends with action items that we discussed at our last meeting in November of last year. So we can kind of come to some closure on

internal issues and the path forward.

So I guess, Brant, we'll let you take it away with the thorium paper.

DR. ULSH: All right. The last time NIOSH weighed in on data adequacy issues, we had been discussing a number of them over the years, I think it was in August of last year when we issued our report, and that report went through SC&A's report on the same topic, point by point, and responded to it.

The one exception was several comments related to thorium-232. And for those, we reserved opinion on that. We said, you know, we're working on a comprehensive position and we'll address it in a subsequent document.

So the document that I sent out, retrospective dose reconstruction for thorium-232 activities at Mound Lab is meant to address those thorium comments where we had reserved opinion.

To try to make this a short story,

I started with MJW's pre-1989 Dose Reconstruction Report.

And they, in the appendix of that report, identified by name workers who had been monitored for various radionuclides including polonium-210, plutonium-238, tritium, actinium-227, and also thorium-232.

So I went through their report and made a list of all of them that had been exposed to thorium or had been monitored for thorium-232 and then I bounced that list against NOCTS to see if any of those people were claimants, because if they were, then I had their dosimetry results.

And I found 20 people, 20 claimants who had been monitored to thorium-232. I then asked ORAU to conduct partial internal dose reconstructions for thorium based on monitoring results that were in their dosimetry file.

So what this paper that I've just sent to you describes is the dose

reconstructions for those 20 people, basically, as a demonstration methodology, using the techniques that we used.

So I wanted to focus on the real situation, not abstract generalities that make implausible assumptions piled upon implausible assumptions.

I wanted to say: this is how we do it, and what are the results? Just to give you some background, Mound, in 1954, in December, received trainloads of monazite sand extracts.

This was in support of the upcoming breeder reactor program where they were going to irradiate thorium-232 and generate uranium-233.

So Mound was slated to operate a thorium-232 refinery. They were going to go through and pull out the thorium-232 from these monazite extracts.

Well, Mound received, like I said, trainloads of this stuff in 55 gallon drums.

And right after they got it in the summer of '55, the thorium refinery project was cancelled.

So Mound is left sitting with these thousands of thorium drums, well monazite sand drums. And unfortunately, some of the extracts were caustic and corrosive. So they ate through the drums and the material had to be redrummed several times between '55 and the mid '60s, I think 1965ish.

At that time, they got tired of doing that. So they built Building 21, and that's the name of the building. The name of it, Building 21, and in actuality, it's an underground storage silo.

The roof is basically at ground level. It's in a remote part of the Mound site in the back hill.

And they got tired of redrumming this material, so they dumped it into Building 21 where it sat until 1974 when they sold the material to General Atomics. General Atomics

came to the site, packaged it up and took it away.

So in a nutshell, that's the thorium activities at Mound. Mound never operated the refinery, they never did any significant work with the thorium other than redrumming the extracts.

So if you look at the thorium urinalysis results, in the past, we've had a bad opinion of thorium urinalysis, I guess. But when I looked at it, I saw about 350 or so urinalysis results for thorium, one third of which were positive.

Now, the reason that's significant is because of the knock on thorium urinalysis has been that it's so insensitive that you can get a really high missed dose. In other words, you could get a negative result and still have a significant intake.

So the fact that you have one third of these samples that are positive, I think, speaks to this argument about it being

implausibly high. If they're positive, they are what they are. They're not implausible.

It's hard to say that the missed doses are implausibly high when a third of them are positive.

So we reconstructed the doses for thorium for these 20 people. We compared it to what's more widely recognized as more significant radionuclides, polonium-210 and plutonium-238.

We also looked at different organs. We looked at lung, bone, and then a non-systemic organ. I used prostate just to represent that.

And what we found was that the thorium doses that we calculated were of a similar magnitude to the doses that we calculated for polonium-210 and for plutonium-238.

And for those, no one's talking about those being implausibly high. So the goal of this was to compare it to these other

two radionuclides and see, you know, if thorium's 100 times higher than these, then this is a problem.

So don't ask me exactly what the number is because I don't know. But the fact that they're of similar magnitude and we seem to have opined that plutonium-238 and polonium-210 are not implausibly high, I would make the argument that neither is thorium-232.

They're not trivial. We do have to include them in dose reconstruction. They are significant.

But I think the point of this White Paper is that these doses are not implausibly high, and it's not a valid basis for an SEC because of that. So that's the thorium White Paper.

MR. FITZGERALD: Yes, of course we've had it for about a week. And Ron Buchanan's on the phone. I had Ron take a look at -- is that on?

MR. KATZ: Yes, it's on.

MR. FITZGERALD: Okay. I had Ron certainly scan it and see if --

MR. KATZ: Oh, whoa. Who was that? It was muted.

DR. ULSH: Don't make me repeat all that.

MR. KATZ: Holy mackerel.

MEMBER ZIEMER: He's probably read it.

CHAIR BEACH: Yes, but we have Phil on the line that didn't hear any of that.

MR. FITZGERALD: Phil?

MEMBER SCHOFIELD: It came back on just now.

MR. KATZ: Phil, how long were you muted for?

MEMBER SCHOFIELD: Oh, about five minutes.

MR. KATZ: That's about how long Brant was talking.

CHAIR BEACH: All right, Brant. Let's see if you can do it again.

MR. KATZ: Brant, take two.

DR. ULSH: Well, let me see if I can make the short story even shorter. Phil, we're talking about the thorium White Paper that I sent out, week, week and a half ago, whatever.

This White Paper was meant to address the remaining issues that we didn't address in our previous internal data adequacy response.

We had kind of left thorium hanging out there. So the purpose of this paper that I just sent out was to take a look at the workers, the claimants from Mound who were monitored for thorium-232, actually do internal dose reconstructions for them. Compare the doses to polonium-210 and plutonium-238.

The long and short of it is what we found is the thorium doses are of a similar magnitude to those other two. So the point of our paper is that these thorium doses are

significant. They have to be included in dose reconstruction. But they're not implausibly high, by the same reasoning that plutonium-238 and polonium-210 are not.

MR. FITZGERALD: And I guess what I was going to say is, you know, given the fact we got the report last week, I asked Ron Buchanan to take a look at it.

See if we would have the opportunity today to ask some clarifying questions, something that would help us develop, you know, our review of this latest paper.

And he's on the phone. So, Ron, could you highlight some of the questions that perhaps Brant and his folks can answer? Hello?

MR. KATZ: Ron, are you on the phone?

MR. FITZGERALD: Are you on mute? Ron Buchanan?

MR. KATZ: Phil, are you still on

the phone?

MEMBER SCHOFIELD: Yes, I am.

MR. KATZ: It's still live. Ron Buchanan, are you on the line? Are you on mute, perhaps? Someone want to call Ron?

MR. FITZGERALD: Yes, he was on when we started this morning.

MR. KATZ: Maybe he hung up and is dialing back in.

CHAIR BEACH: Because he thought he cut off, yes.

MR. KATZ: Because he thought he was cut off. Maybe.

CHAIR BEACH: Well, I have a question, Brant, while we're waiting.

DR. ULSH: Fire away.

CHAIR BEACH: How do you know it was just those 20 people that did the redrumming?

DR. ULSH: Because we reviewed the health physics progress reports for the time periods that we have them. There's also, I

think, an interview in the SRDB where we interview a guy who was involved with this.

And he told us about how many people were involved, and this is consistent with it.

The health physics progress reports told us how many people had been bioassayed for thorium-232.

I compared that and we had pretty good agreement. So all of those things together tell me. And if you think about the scale of this, it seems to be about the right number.

CHAIR BEACH: Okay.

DR. ULSH: So bottom line is, if you wanted to argue that other people could have been exposed, then I guess I would come back with, well, we have the data sufficient to do a coworker model if we needed to.

CHAIR BEACH: How many urinalysis reports do you have for those 20 individuals?

DR. ULSH: How many what?

CHAIR BEACH: How many urinalysis reports?

DR. ULSH: Well, I can tell you that there were 300 total thorium urinalysis results.

CHAIR BEACH: From '55 to '75?

DR. ULSH: That sounds about right. I would have to look for sure, Josie, but it's over the time period of the thorium redrumming.

CHAIR BEACH: And have you sent that access, those results to SC&A? Or have they asked for those?

DR. ULSH: Well, they haven't asked for it, I think.

MR. STIVER: I think we would definitely like to see those.

DR. NETON: Brant, I thought when you put out the report, or maybe that was just to me, you sent references to locations where that original --

DR. ULSH: Yes, that's on the HPT.

DR. NETON: Okay, that wouldn't be acceptable to them?

DR. ULSH: Right. As you might imagine, when we do dose reconstructions, there are a number of support files that go with each one. Those are available and I'll make them available to you.

DR. NETON: Okay, thank you.

DR. ULSH: I mean, these aren't full dose reconstructions. They're just partial internal. But we'll have the IMBA runs and the, you know.

MR. STIVER: You guys even know the raw data, the results --

DR. ULSH: Yes, they'll be in there.

MR. STIVER: The methodology's all laid out in your paper.

DR. ULSH: Yes.

MR. KATZ: I don't think it will transmit that well. I don't know why he can't get in.

MR. FITZGERALD: He had no problem until just now. And then he couldn't get back on after the break.

MR. KATZ: And we don't have enough people to be clogging the line, not even close. Is he trying again?

MR. FITZGERALD: Yes, he's trying.

MR. KATZ: Okay.

MEMBER SCHOFIELD: Ted, I had to dial back in to get anything.

MR. KATZ: Okay, it sounds like Ron's having a similar issue. But the code's not working for him for some reason.

DR. NETON: Maybe he tried and couldn't get in because it was on mute.

MR. KATZ: Didn't realize he was in -- but he would still know he was joining the party because you get a message saying --

DR. NETON: Nothing, silence, right?

MR. KATZ: Yes. But I think he's trying right now.

DR. NETON: Yes, he's trying again.

MR. STIVER: Brant, you said the redrumming --

(Simultaneous speaking.)

MR. FITZGERALD: I have his question set anyway.

DR. ULSH: More or less.

MR. STIVER: More or less?

DR. ULSH: The material arrived in the winter of '54, in December. I think they started redrumming in the summer of '55. I might be wrong on that.

There might be a couple-year delay. And by 1965, they had emptied it into building 21.

MR. STIVER: Okay.

DR. ULSH: So between those years.

MR. STIVER: Do you have any information on how many redrummings took place?

DR. ULSH: Those numbers, I think, are available in the health physics progress

reports, because that's where I pulled them from.

MR. STIVER: Okay, they're in the progress reports?

DR. ULSH: But, the health physics progress reports are only available up through 1960, I think.

MR. STIVER: Okay. So you have some evidence near your time period, but not necessarily later.

DR. ULSH: Well, between '60 and '65 I don't have progress reports that describe that redrumming effort in detail. They were doing it during the summer months because it was outside.

MR. STIVER: It was a continuing effort?

DR. ULSH: Yes.

MR. STIVER: Due to the corrosive nature.

MR. FITZGERALD: I have Ron's question set. And I will just go through

them. And, you know, certainly it's too bad he can't participate. But I assume Ron, you're not on?

MR. KATZ: It's mysterious.

DR. CHEW: I just emailed some of the other people that they can hear us.

MR. KATZ: So everyone else is getting on.

MR. FITZGERALD: Okay. If Ron were here, what he would ask, and pardon me if I read these, I don't want to miss any --

MR. KATZ: That's fine.

MR. FITZGERALD: -- of his nuances. In addition to the drum material from ULC, Mound also received thorium containment materials from the St. Louis Airport, according to Page 15 of the TBD.

And the quote from the TBD was, this is the Cotter concentrate issue. SW building was used in the Cotter concentrate, i.e., St. Louis Airport case starting in the early '70s and terminated late in that decade,

late in the '70s.

Pile and plant operations in SW were to recover thorium-230 and palladium-231. The Cotter concentrate contained 99.9 grams per drum of thorium-232, and 11.1 grams per drum of thorium-230, according to Page 16 of the TBD.

Additionally, thorium was used in other areas of Mound as stated on Page 12 of TBD. And the quote from TBD, again, was -- and I'll give you a copy of this.

DR. ULSH: Yes, I can't copy it all down.

MR. FITZGERALD: Right, right. No, I'll give you a copy, don't worry about that. But this is the quote from the TBD.

"Thorium-232 was often substituted for plutonium-238 compound for modeling purposes and research development because this isotope was less expensive, less hazardous and had physical characteristics similar to plutonium-238.

"It is possible, therefore, to find thorium-232 compounds identical to the 238 compounds." That's, again, a quote from the TBD. His concern, he didn't see that treated specifically in the White Paper.

Sort of one activity for thorium and just was wondering if that was intentional or?

DR. ULSH: Yes, it was intentional because this was the biggest, most significant activity with thorium-232. You know, Joe, you were around for the Rocky Flats, when we were talking about thorium-232 there.

And the same kind of situation existed there where they would use thorium as sort of a almost, non-radioactive substitute for plutonium.

MR. FITZGERALD: Right.

DR. ULSH: The same kind of thing here. Mound wasn't involved with metallurgy or grinding or polishing these thorium parts.

And in addition, in our previous

response on the data adequacy thing, issue, we talked about how Mound monitored for the controlling radionuclides.

So if you've got small amounts of thorium-232, from a radioactive standpoint, and I'm thinking of the Cotter concentrate now, and larger amounts of other radionuclides, they did a gross alpha procedure.

And that's described here, in fact, in this White Paper. And we attribute it to the most limiting of the radionuclide mixtures.

So certainly, for the Cotter concentrate program, that's the strategy that we would employ there.

Sure, we would consider thorium-232 in the mix, I guess, for the possible interpretation of gross alpha results.

But I can tell you that's not going to be the one that's going to be

controlling in that situation.

MR. FITZGERALD: Okay, so it was with some forethought. This was, in a sense, I don't want to use the word boundary. This was sort of the activity that presented as the highest potential exposure.

DR. ULSH: Yes, well, I didn't approach it exactly in those terms. But yes, I guess I would agree with that. I approached it as they had trainloads of this stuff.

If I'm going to be looking at situations where people could have been exposed to thorium-232, this is the one I'm going to look at. Not, well, we've got this little part here that's thorium instead of plutonium.

MR. FITZGERALD: This would be the most significant source term --

DR. ULSH: Exactly.

MR. FITZGERALD: -- in terms of quantity and treatment. Okay, that was sort of off the top, we haven't gone through it.

I'll give you this to look at, but heck, I can't even read it.

CHAIR BEACH: He's younger.

MR. FITZGERALD: Oh, okay. I would need reading glasses. But this is why I actually printed it before I left. I realized that there's no way.

DR. ULSH: Oh, he used small font.

MR. FITZGERALD: Yes, he used small font. Josie actually came up with a larger font, so I'm using her copy. Anyway, the second comment or question is: I'll read this.

NIOSH is assuming that the statement on Page 18 of the TBD, and this is the quote -- oh no, I'm sorry. This is from the White Paper.

"Fortunately, Mound had a comprehensive radiation protection program, including effective bioassay techniques for detecting intakes of all three radionuclides. Therefore, internal organ doses can be

calculated."

And his comment is: it is correct for 1954 through the clean-up period of '75 and beyond for any residual field buildings or other sources of thorium.

And his concern is: however, other DOE sites such as Weldon Spring, he's been working on Weldon Spring, did not have thorium monitoring during the '50s and '60s.

And likewise, Los Alamos was not able to provide them with much guidance concerning how to, in fact, evaluate thorium intakes and Y-12, as another example, did not use their mobile thorium counting unit at Weldon until '66.

So he was just reflecting on the fact that it didn't seem like it was a whole lot of, if not knowledge, application in terms of monitoring for thorium in the '50s and the early '60s.

And was just wondering if that statement of having the so-called rigorous

practice applied across the history of the thorium-232 handling, because it doesn't seem to be consistent with other sites when they tangled with thorium-232 and their ability to monitor it.

So even though there's a, I think, a very detailed bioassay procedure listed there that was, I guess, available, whatever, that's his concern from other sites. Why would, you know, Mound stand out?

DR. ULSH: I can tell you that this procedure, this gross alpha procedure that Mound actually developed, they used it for a number of different radionuclides, the gross alpha part of it was the same.

And then they used sequential stripping off of the columns for first the radium and second for thorium.

That was developed at Mound. Why it wasn't used at Weldon Spring or LANL I have no idea, because I haven't been involved with those sites.

All I can tell you is I know exactly what the procedure is for Mound, and I know they used it, that's recorded here.

MR. FITZGERALD: Again, as a reflection, when he went through that detail, I don't think he was familiar with Mound's particular approach to thorium but found it different than the other sites.

So, you know again, I'll go through this. The next question, and this actually has to do with the protocol.

The procedure listed in the paper's relatively lengthy chemical procedure would require considerable time to perform, especially on routine urine samples.

According to Page 13 of the paper, this is the White Paper, both urinalysis results for the 20 workers included in this study were prepared in accordance with the procedures described above. These results were entered into the, I guess it's CADW tool, the lung tool.

DR. ULSH: Yes.

MR. FITZGERALD: To calculate intakes of organ-specific doses for the lung, bone and prostate.

And the question is did each of the 20 cases have routine or special work assignment urinalyses preformed using this procedure and recorded in accordance with a written sampling procedure?

Or was there just spot checking of urine samples for thorium? You know, in other words, what was the actual implementation? Is there any knowledge of that?

CHAIR BEACH: And before you answer, I just emailed that to you, Brant, on your CDC email.

DR. ULSH: Okay, thank you. I got a little buzz from my BlackBerry, that's probably what it was. I'm not quite sure how to interpret Ron's question, but I'll take a crack at it.

MR. FITZGERALD: It might be

easier just to read it. I mean, there's a lot there, but I think his concern is the actual implementation of the protocol itself and how it was used for the 20 workers.

DR. ULSH: Well, the protocol itself, if I understand what you're talking about is the actually gross alpha procedure followed first the radium stripping and then the thorium stripping.

Yes, it is a lengthy procedure, but they used the gross alpha technique extensively, not just for thorium.

Thorium-232 was certainly not one of the main radionuclides at Mound. Those were plutonium-238, polonium-210 and tritium.

But the fact that they had those gross alpha procedures that they could add on to detect thorium and its radium daughters meant that they had a technique available to use as needed, and they used it for the people in this thorium-232 program. I don't think that everyone at Mound would be on a routine

thorium-232 urinalysis program because it wasn't one of the main radionuclides.

They just used it for this program, and a few others as appropriate. I mean, they used the same technique for the ionium program, thorium-230, because chemically it would pull off the ionium.

MR. FITZGERALD: Right.

MEMBER ZIEMER: But Joe, were they asking, you used the word "spot check." Was he asking if they just did spot checks in this series?

MR. FITZGERALD: Yes, he was reflecting --

MEMBER ZIEMER: Or were they routinely doing thorium as part of this group?

MR. FITZGERALD: He was reflecting the fact that it seemed like a pretty detailed and lengthy procedure, and for the time, it would have been, again, I think he's looking at it not with a lot of intimate knowledge of the Meyer program as it existed.

But was wondering, you know, was this routinely applied for all of the workers potentially exposed to thorium? Or did they use it more of a spot check, you know, taking a sample of the workers that would have been involved in the program?

The implementation, in other words, the actual monitoring program for thorium as opposed to the actual procedure, versus the procedure.

DR. ULSH: I understand now, I think, what you're saying. I have seen no description anywhere that this was done only on a spot basis for thorium.

The way Meyer described it, and that's referenced in the White Paper, I don't know if he was talking -- well, he actually does have a specific section on the thorium-232 program and urinalysis.

I guess I would refer Ron to that to see if that provides the details that would answer his question.

My impression is certainly that they, just like with the other urinalysis programs at Mound, they applied it to the workers who were involved.

That's the language that Meyer uses. He doesn't say that they just did a spot check for thorium. I mean, it's --

MR. FITZGERALD: Yes, I think when he was looking at the 20, then the 60 which the 20 was drawn from, you know, I guess there was 60 that had results. And there was 20 for which you had --

DR. ULSH: Well --

MR. FITZGERALD: -- actual claimant information, is that --

DR. ULSH: There were, I can't remember the number that MJW identified in their pre-1989 Dose Reconstruction Report. But in the appendix, it goes through and lists them by name and tells what their thorium doses were and elevated nuclides as well.

I went through and pulled out the

names of any that had thorium-232. And I can't remember exactly what that number is. It's in the White Paper somewhere.

MR. FITZGERALD: Right.

DR. ULSH: I bounced that larger list against NOCTS to see how many of them were claimants and identify 20 individuals.

MR. FITZGERALD: Yes, I think the number was 60 that 20 was drawn from.

DR. ULSH: Could be, yes.

MR. FITZGERALD: So that was the source of his question, trying to figure out, you know, it's just that procedure was cited in there. Was that routinely applied to the 60?

Based on what you saw on the 20, did it look like they had, you know, a fairly complete set of results in terms of analysis?

DR. ULSH: Well, they didn't have huge numbers of thorium urinalysis results. But that kind of goes along with what you might expect from an episodic program.

And this was clearly an episodic program because since it was outside, they were only doing it in the summer months.

And so we see generally, you know, a couple of samples from these people right around the time that they were doing the redrumming efforts.

So then they would take a break over the colder months and we don't see thorium results there.

MR. FITZGERALD: Now, I think you in the paper note that the actual raw data, the monitoring data and individual data is on the SRDB, is available.

I mean, we can get to it. I think that would probably answer some of these questions.

DR. ULSH: If it's not, I'll get it to you. Jim and I were just talking, since I asked ORAU to do partial internal dose reconstructions for thorium.

And keep in mind, this list of 20

people, some of them have already been compensated based on dose reconstruction or based on SEC. But I just wanted to show, here's the 20 people and we can do it in every case. That's why we did it.

MR. FITZGERALD: Right.

DR. ULSH: And I can make those support files available to SC&A. And they're going to contain the typical things that you would see in one of our internal dose reconstructions, have the urinalysis results and, you know, all the different IMBA calculations and what not.

So that might answer some of these questions.

MR. FITZGERALD: I think so. Again, this was just his initial reading of the paper over the weekend.

So I mean, I think these are initial, you know, questions about the data itself. Now I think there's sort of a additional question that you can read there.

Was any of the air data in table three of the White Papers on Page 22, or other air data employed in the dose reconstructions? Or was it just strictly urinalysis?

DR. ULSH: I'm getting to Page 23, but I can tell you that it was urinalysis.

MR. FITZGERALD: Okay.

DR. ULSH: The reason I put that in, the air data in this report was simply to show, oh yes, there it is, Table 3, that Mound was monitoring not just with urinalysis but also with air monitoring.

They were monitoring for thorium-232 and they were also monitoring for short lived daughter products.

And if you look at the number of samples that they had, just for instance from Meyer's 1955 report, I think that's one of the health physics progress reports.

April to May of '55, they took -- well, just in the WD low risk they took 56 sampling days. It records the maximum and

average air concentrations.

This data was simply shown here to illustrate that Mound was monitoring for this. They recognized that there was a radiological, you know, situation with it that they had to monitor for, and they did it.

I didn't take these air samples and then go ahead and calculate a dose reconstruction. I used the urinalysis data for that.

MR. FITZGERALD: Okay.

DR. ULSH: I suspect, now this is a hunch, that if you have a person where he has only urinalysis data and they're all negative, and I were to make some assumptions and calculate a missed dose from the air data, it will probably be lower.

MR. FITZGERALD: So the air data's available if it had to go that far?

DR. ULSH: Yes.

MR. FITZGERALD: I mean, if you didn't have urinalysis data?

DR. ULSH: Yes.

DR. NETON: These are general area air samples?

DR. ULSH: Yes.

MR. FITZGERALD: Okay. The next question was: was access to and working with the thorium containment materials controlled by physical barriers and/or procedural requirements? Sort of an operational question.

DR. ULSH: I know that they would have had an exclusion zone. I think I'm recalling that from the interviews, when we talked to the worker that was involved.

He did tell me that they had respirators, but you know, they weren't real rigorous about using them, especially on hot days.

I don't know about physical barriers, that we discussed. But keep in mind, this was done in a remote area of the site. It wasn't done in the front parking lot

where everyone would walk past it on the way in.

This was a destination. If you wanted to go to the back hill where --

MR. FITZGERALD: That's where this question was headed. Just, you know, could you reasonably identify the cohort, the group that would have been potentially exposed to the thorium.

And, you know, was there any way to demarcate that? So what you're suggesting here on this activity was, you know, you didn't just wander by or wander in.

It was, you know, you were there for a specific task and it was --

DR. ULSH: Well, yes. I don't want to state it too rigorously. I mean, if you wanted to talk to Fred, and he was working on it, you drove back to 21 and talked to Fred.

CHAIR BEACH: Well, and if you've ever worked on a DOE site, everybody comes to

look when there's something happening. So you tend to have three workers and 20 people watching. Every day.

DR. ULSH: Okay. Can't say. This was 1955. That's a lot of time we're talking about.

CHAIR BEACH: Probably wouldn't be much different than today.

MR. FITZGERALD: Now, I think this goes to the, you know, I think there's the 60 workers that showed up with some positive indications in the MJW database for exposure, which you picked the 20 that had the actual claims, I think, from that 60.

Would there be, you know, a worker group with potential exposures higher than the 60? I mean, the 60 is just what you can actually pick out from the database.

And this goes back to the MJW, you know, how they actually put that database together.

And I guess the question is: is

the presumption that that MJW review actually parsed out who would have been potentially exposed in addition to who actually had?

You know, one thing is to look at the database and say who had actual thorium-232 indications in their exposure record? The other is to figure out who is potentially exposed. And I think that's where he's coming from with that.

DR. ULSH: The MJW, the table that I looked at in the back of the MJW report, and in fact, MJW's report focused on the workers who had greater than 20 rem committed effective dose equivalent.

So these are the highest exposed workers of the Mound cohort.

MR. FITZGERALD: Right.

DR. ULSH: Now not all of them have those high doses from thorium. In fact, most don't. There's a number of them from polonium-210 and a number of them from plutonium-238.

But the 60 in there certainly have non-zero thorium doses. So in general, these are the highest-exposed workers. And that's really about as specific as I can get.

I have no reason to think that the people who showed up, first of all, the people who were monitored for thorium-232, as you noted, it was a, you know, labor intensive procedure.

MR. FITZGERALD: Right.

DR. ULSH: They're going to do it for the people that are involved with the work. I have no reason to think that people who were not involved with the work would have had a higher exposure potential.

MR. FITZGERALD: So perhaps the strategy is once you can demonstrate there's a way to use the data to dose reconstruct, if somebody comes in, perhaps on a CATI interview or whatever and identifies possible thorium work, even if they didn't show up in this, you know, this MJW database, then there's a

pathway.

Although, I guess you would have to use a coworker distribution of some sort.

DR. ULSH: I guess we would, yes. I mean, it's the same as any other situation where if someone identifies in the CATI that they worked with a particular radionuclide, and we have no indication of it in their dosimetry file, we generally approach that with a coworker file, right Jim?

MR. FITZGERALD: Yes, and in particular in this case as to the MJW threshold, what, 20 rem?

DR. ULSH: Yes.

MR. FITZGERALD: Yes, so it is certainly possible you have, you know, some workers who didn't quite get to that level but would have raised their hand and said yes, I did this or that with the drums, but did not certainly get exposed as much.

DR. ULSH: I will tell you that the thorium-232 urinalysis results were in the

dosimetry files.

So if we have a worker, a claimant show up with thorium-232 urinalysis result and it's not listed in MJW's report or in our paper here, we would do a dose reconstruction on them for thorium-232.

MR. FITZGERALD: Yes, there's really three groups that you have the group that's included, the highest-exposed thorium workers.

And what you're saying is that you have workers that were, in fact, bioassayed but did not rise to the level that they would have picked up in MJW's screen.

DR. ULSH: Yes.

MR. FITZGERALD: And then you have workers that presumably weren't bioassayed for thorium-232 but would be self-identifying or perhaps would indicate that they might have had some contact.

DR. ULSH: Yes. Sure.

MR. FITZGERALD: So I guess it's

the last one where a coworker model would have to come into play somehow.

DR. ULSH: Yes, I mean, the purpose of my White Paper was not to say these are the only people who were exposed to thorium.

MR. FITZGERALD: Right.

DR. ULSH: It was simply to say here's the guys that we have dosimetry files on hand so we can actually do it. And we can do dose reconstruction in all 20 cases to demonstrate that we can do it.

Now, I'm not saying that there aren't other people, other claimants, future claimants that --

CHAIR BEACH: Well, I'm just curious, Brant. What level of detail did you have on those 20 individuals? Did you have craft-specific for their HPTs or the guys actually redrumming, or do you have that level?

DR. ULSH: The raw urinalysis

records are included in the thorium-232 redrumming log book. That's described by Meyer.

So if they've got a urinalysis result in the thorium-232 redrumming log book, it stands to reason that that's what they were involved with.

We've got the same level of detail on these people as we do for any claimant. I mean, you know when they worked and in some cases, what their job titles were.

In fact, I think, oh, I'm trying to remember. I wrote this a while ago and I think I put in the White Paper kind of the range on employment, how many years of employment they had.

CHAIR BEACH: Yes, you did. Got that. And it was six to 45. It was quite a large range.

DR. ULSH: Yes, I have that information available for each of the 20 people. But I didn't want to put it in here

for fear of Privacy Act.

CHAIR BEACH: Yes, no, no.

MR. FITZGERALD: I mean, MJW database, I think, it's been a while since --

DR. ULSH: Well, the MJW reports are in the SRDB.

MR. FITZGERALD: Okay.

DR. ULSH: I think that's in reference to your --

MR. FITZGERALD: Not necessarily the database itself.

DR. ULSH: Well, what do you mean?

MR. FITZGERALD: Well, I mean the actual --

DR. ULSH: -- the electronic database?

MR. FITZGERALD: Yes. The actual 1,500, whatever it was that had the 20 rem threshold.

DR. ULSH: No, those are listed in the table.

MR. FITZGERALD: Oh, they're

listed actually, okay.

DR. ULSH: Yes. That's where I got them.

MR. FITZGERALD: Okay. So the only thing that's not up there is, I think, the 20 specific claims, from what you're saying.

DR. ULSH: Right. The support files for our dose reconstruction.

MR. FITZGERALD: Right. Everything else that the MJW report, I guess the Meyer's bioassay, you know, that reference is there. So there's only that one piece that, and you can make that available in case we need to go through that. Okay.

Just going down to the next question, I think you can see that --

CHAIR BEACH: Maybe.

MR. FITZGERALD: Maybe. I think you may have actually touched on this already. What situation or procedure triggered the need to obtain the particular urinalysis sample,

you know, the gross alpha and have them analyzed for thorium, and the actual recording of the results themselves?

I think you said earlier that they knew who was actually involved with the thorium work. And those would have been the ones that would have been earmarked for that kind of sampling.

DR. ULSH: Yes.

MR. FITZGERALD: Okay.

DR. ULSH: Yes, worked with thorium-232.

MR. FITZGERALD: Right. It would have been a judgment call by the HP or whomever at --

DR. ULSH: It always is.

MR. FITZGERALD: -- at that point in time. Next one. The paper does a good job in demonstrating that thorium is an important consideration for some Mound works.

I think the question is operations again. However, there are still some issues

concerning who was monitored and had their samples analyzed for thorium, and how often. We've covered a lot of that.

And I think what he's saying is that the evaluation we would do at this point is looking at the selection of the workers for bioassay and the monitoring and the procedures of dose reconstruction cases in detail which is what, you know, with the addition of the 20 cases, I think we'll have enough to go over.

DR. ULSH: All right.

MR. FITZGERALD: Would you be the point of contact if there's anything that comes up? I think we would like to go ahead and just package this thing.

DR. ULSH: That would be me, I wrote this.

MR. FITZGERALD: Okay. Sorry, Ron. That must be frustrating. He was on most of the morning and couldn't dial back in. Okay, I think that, yes, I think this is fine.

CHAIR BEACH: Okay.

MR. FITZGERALD: Like I said, that will help us get started on that.

CHAIR BEACH: All right. So Work Group Members, any more questions on thorium, clarifying?

MEMBER ZIEMER: Not a question, but just a comment. This is a general comment just for this particular paper. But it shows up here and it has before.

It would be helpful if everyone who does White Papers put the date of the paper on the paper.

CHAIR BEACH: Yes.

MEMBER ZIEMER: I know it shows up in the file name, but sometimes when we file these, we file them in a separate way.

DR. ULSH: Okay. Will do.

MEMBER ZIEMER: It's always helpful. Or the paper's connected with an email that's dated, but they become separate. And just a reminder to do that, that's very helpful.

DR. ULSH: All right, will do. Thanks, Paul.

CHAIR BEACH: Any other comments on thorium? Phil, how are you doing? Any questions, comments?

MEMBER SCHOFIELD: Doing okay here, so far. I'm hearing most of it.

CHAIR BEACH: So just to recap on thorium, I sent you Ron's questions, so that's done.

And the only other action item I have was for NIOSH to make available the raw data support files to SC&A. Anything else? Did I miss anything else?

MR. FITZGERALD: No, I mean I think we'll now try to look at the information and come back with a response on thorium.

MR. KATZ: Joe, if you would just email me Ron's questions, too, then I could send it to the court reporter, just to make sure.

CHAIR BEACH: I will do that right

now.

MR. FITZGERALD: Yes, I think she answered that one.

MR. STIVER: And send those to me too, Joe, if you would please?

CHAIR BEACH: Okay, and so then we're onto, if you have it, Joe's or SC&A's paper dated January 12th, 2012.

It's subject: adequacy and completeness of Mound internal dosimetry. We'll go ahead and let Joe start that.

MR. FITZGERALD: Okay. I think at the last Work Group --

MEMBER ZIEMER: What's the date on that?

MR. FITZGERALD: January 12th.

CHAIR BEACH: 12th.

MEMBER ZIEMER: Okay.

MR. FITZGERALD: Yes. The last Work Group meeting, you know, I think Brant walked through the NIOSH response to a proposal or actually an action that we took a

year before. This has a lengthy history.

I hesitate to go through it. Maybe I will. But at the time, I said that, you know, I think we had squeezed as much as one could squeeze out of this issue, and I felt that we're, on a technical level, sort of reaching diminishing returns. We're at a bit of an impasse.

And so I wanted to use this opportunity, rather than continue to exchange White Papers, just to kind of step back and sort of do an overview of the issue and come to some kind of a closure recommendation for the Work Group.

So that was the purpose of the memo. And also to identify any loose ends that, given the history of this thing, that we may not have covered in any detail.

And that was the attachment that we talked about earlier. Just a little bit of background, because this does have a bit of history.

I mean, this sort of originated from a number of specific, radionuclide-specific issues that were raised in the Site Profile and carried forward into the Evaluation Report Review that SC&A conducted anywhere from, you know, singling out issues with neptunium and curium to some issues on plutonium and uranium.

But there was a number of questions involved with that. And there was also issues that were broached by the Work Group that, as usual, asked SC&A to look at data adequacy completeness, both for external and internal sources. And we essentially have done that, as well.

At some point, I believe it was in 2010, the Work Group decided just to consolidate the issues.

To take the data adequacy and completeness issues for internal and also these very specific, radionuclide-specific questions, since a lot of them really got into

adequacy, to treat them as one issue. That's how that evolved.

And also, at about the same time, I think there was a request that Josie had to, when we did that, to look at these various White Papers. Just make sure we weren't losing anything in the process of consolidating this thing into one issue.

And that was the origins of this matrix, which I've attached to this January memo. But it also is the same matrix that I think was included in a paper about a year and a half ago that SC&A presented on status. So that's been around for a while.

In terms of background, we raised a number of these issues about whether, in fact, given the lack of apparent bioassay data for a number of nuclides, in particular these so called other nuclides or exotics, whether in fact there was a dose reconstruction approach that would enable one to address these other nuclides in the absence of that

data.

We talked about the gross alpha counting technique at Mound, whether in fact that, since this was, I think, the first time we actually looked at that particular procedure, whether or nor you could strip out the alphas and still come up with a sufficiently accurate representation of the number of the specific nuclides involved. And that question came up as well.

In response to a number of questions that the Work Group raised and we raised, I think that was the beginning of, you know, the review of what was, I think, called for short the road map.

And that was certainly presented by NIOSH to identify each of these processes and to show, you know, whether or not there was a bioassay method for each nuclide.

And we spent some time looking at the road map, and we'll go through all that. I think most are familiar with it.

And a lot of it got down to whether or not the road map and the King report with the Meyer report within the two bases, I guess, for the road map, whether they could be interpreted to abide a sense of exposure potential, or whether they, in fact, just connoted that the radionuclide may have been present but certainly did not carry that implication that it could have been exposure.

And I think we spent a lot of time, it sort of reminded me of, you know, if one could find Mr. King or Dr. King, it would have been useful. But we never were able to find him.

CHAIR BEACH: Not for lack of trying.

MR. FITZGERALD: No, we definitely tried. But nonetheless, the interpretation of how to apply the King report and the road map and everything, I think was a lot of the effort that this Work Group addressed.

So anyway, in this memo, I wanted

to boil down, we essentially had two questions.

You know, can the lack of bioassay data for radionuclides being used at Mound be rationalized on the basis that either radionuclide form or handling precluded any exposure potential, therefore making any such monitoring unnecessary?

Or that operations were limited during these time periods to intermittent campaigns for which event-driven bioassay coverage would have been sufficient?

And I think that was maybe a lengthy way of just saying that, you know, could you explain the lack of bioassay, routine bioassay based upon the fact that the site, the health physicist and the operations did not recognize any exposure potential, so therefore there would not have been any bioassay, routine bioassay, therefore no bioassay records for these things?

And the second one, of course, is

the use of gross alpha as a surrogate for radionuclide-specific bioassay, and that was the analysis we did.

And we spent a great deal of time, certainly, on the first one. But I, you know, haven't looked over the record for this. I haven't sat at this table for two or three years, I think, on the issue of the King Report.

I don't think there's a clear way to resolve that. And I think there was very legitimate considerations on both sides.

But I think what I came to the conclusion was that yes, in the King report by itself, given the ambiguity of the context of that report, and again the words can be interpreted different ways, I think one could argue you would need to have something beyond just the King report to corroborate the exposure potential.

I mean, I think that's something that, in the end, one comes up with that.

Obviously I can come up with that conclusion.

And with that, you know, the attempts that we've gone through to, you know, to determine exposure potential in other ways, I think with the lack of actual data, it just becomes a bit of a futile exercise, I think, in the end. Trying to demonstrate the exposure potential without having much in the way of monitoring or operational data, I think in the end there wasn't a way to actually resolve that question objectively.

So, but we attempted to. I think it was a way to see if that could be a means to get around this impasse.

So anyway, I think that's where we came out. That literally, even though we went through almost 100 examples -- no, it was like, I guess 20 or 30 examples with 100 comments coming back, I don't think there's a way to resolve this objectively.

I understand where the finding was. There was no obvious exposure, or if

there was an exposure, you have an event specific bioassay, so what's the issue?

So, you know, I think that's about we're as far as we can take it. But saying that, I guess there's a residual frustration in the sense that we get into trying to demonstrate exposure potential in the absence of, you know, specific information for some of these nuclides.

And I don't see how there's any way to do that. I mean, I think I threw out, personally myself threw out let's go look at some examples and use incidents and what not to see if that might shed some light.

And I don't think that really shed too much light. I think it was, maybe at some point, a frustration just trying to go forward, find some way out of this.

So I think we're still left with this concern that, you know, where you're looking for a quantitative basis to indicate that you have exposure potential to nuclides

that are cited as being in these at the site sort of time frames.

But there's no bioassay records, and how you square that, and you know, on what basis beside the program itself. That, you know, Meyer ran a good program and had techniques, procedures available.

You know, I think the road maps certainly suggest that. There were procedures available. But were they effective, applied or not?

What are their effects on exposures, I don't think there's any way to really underscore that.

And as a parting shot I'd say it's just interesting in contrast to look at Mound. This is the question earlier about, you know, the techniques that were used for gross alpha.

Did Mound, in fact, have a health physics monitoring program in the '50s and '60s that stood apart from other AEC

laboratories such that there was an ability to monitor for a number of these nuclides that apparently other labs did not possess.

And I think there's a bit of a struggle between exposure potential. There was no exposure potential because it just turned out that all the forms of the nuclides that were present did not lead to exposure.

Or, you know, the techniques to monitor were such that any exposure would have been picked up? So it still left me with a sense that we didn't quite get to a hard resolution.

But again, I think our recommendation is that there's not much more that can be gleaned on this topic. And that was the inclusion that we're forwarding to the workers.

That, you know, I think we've done about as much as can be done on the subject. And there's just nothing else that would shed any light on whether or not these figures are

real and whether or not dose reconstruction could be done with sufficient accuracy.

Now, with that, as Josie was pointing out, there was two issues that came out of the last NIOSH White Paper. One was thorium, we just talked about that.

The other was the early years of, I guess, the polonium process. This was the February '49 to September of '49.

And I think there was a recognition that there wasn't any obvious issues with including those. But I'll leave that to you all. And the other one was the thorium.

And then Table 1, which was the attachment, is just again, a old rack up, this goes back to 2010 of pretty much the White Papers SC&A submitted to the Work Group.

And which ones, and this is my estimation, more recent estimation, which ones are open and which ones are closed. And you know, I would defer to NIOSH if that is your

understanding of some of these issues or not.

I could not find any actions or any responses to certain specific items which are listed here.

CHAIR BEACH: So, and I think Joe, you took these from the 100 or 96 comments that SC&A put out, NIOSH commented on, of last year prior to November?

MR. FITZGERALD: Yes, these are everything prior to November.

CHAIR BEACH: So you've taken everything from that and just correlated it. I just want to make sure everybody was on the same page of where all this came from because --

MR. FITZGERALD: Yes. For example, thorium was cited, but obviously that's being addressed. So even though it's thorium, it's listed as being reviewed by NIOSH. That was as of January.

CHAIR BEACH: Okay.

MR. FITZGERALD: So that's moving

forward.

CHAIR BEACH: And we did ask for information from NIOSH on these. So I guess I'll let you go ahead and take over, Brant?

DR. ULSH: Just one administrative clarification. For those of you who are gluttons for punishment and want to go plow on back through here to see where everything came from.

The hundred or whatever it was comments, they weren't actually formatted by SC&A as a hundred comments.

It was SC&A's report, and I took that report and cut it up piece by piece into a hundred-plus comments and issued a response to each one. So don't be confused about where that came from.

CHAIR BEACH: Thank you.

DR. ULSH: To be honest with you, I looked at the recommendation on Page 5 of 8, where basically SC&A recommends closing these issues, just a couple of exceptions, thorium,

polonium in 1949, and tritides.

And this issue has been so contentious and I was so anxious to get it in the rearview mirror that I stopped there. Oh my God, we're done.

But I'll go through and look in more detail and attach more. I don't want to plow back through the history of all of this if we're close to agreement.

So I guess I'll just talk specifically about the polonium one in 1949 to remind everyone what the issue is.

We have an SEC for Monsanto. I can't remember how far forward in time that is off the top of my head.

And then we have an SEC for Mound for all workers that picks up in September of 1949. And I think that leaves a gap at the beginning of 1949.

CHAIR BEACH: February 1st, 1949 to September 30th, 1949.

DR. ULSH: Okay, so that's kind of

the gap period that we're talking about. I have no real objection to filling in that gap somehow, making it kind of a continuous SEC.

We're going to have to think about how to do it, because the basis of the current Mound SEC is the radium, actinium, thorium separations activities.

And that material did not arrive on site at Mound until September of 1949. So I don't know how we would go back and extend that earlier when the material wasn't even on site.

But maybe there's a way that we can extend the Monsanto SEC forward. I don't know, I'm just thinking out loud here. That might be more technically justifiable.

I mean, to be honest with you, at the time, Monsanto was transitioning to the Mound site. It was Unit 5 of the Monsanto Project. Before that time, Monsanto had several different operating units, Units 1 through 4.

One at Bonebrake Seminary, one at Runnymead Playhouse. There were a couple of others, but I can't recall off the top of my head. But they were scattered around the Dayton area.

And in 1949, all those activities were sort of consolidated at the Mound site. So I think administratively, I'm going to have to put my head together with Jim and maybe Jenny or whoever if there are legal issues about how to do this.

But, you know, people are going to be going back and forth between Monsanto and Mound, when they're trying to open the facility. I'm not going to try to tell you that there's a bright line distinction between the two sites.

So I really have no objection to filling in that gap somehow. It's just a question of how we do it.

CHAIR BEACH: So is that something, because I know --

(Laughter.)

CHAIR BEACH: That's where it was left last year. So is this something --

DR. NETON: Yes, there's something else going on with Mound, though, the early years of Mound is becoming --

DR. ULSH: No, well, we're doing an 83.14, I think, to address those gaps in the tritium log books for the radon.

CHAIR BEACH: Oh, radon.

DR. NETON: No, the Mound, the DOE --

DR. ULSH: Oh, yes.

DR. NETON: -- on that paper has reclassified the Mound site in the very early years.

DR. ULSH: Mound, or --

DR. NETON: It was Monsanto.

DR. ULSH: Monsanto.

DR. NETON: Monsanto is going to become a DOE facility.

DR. ULSH: So I don't know what

the implications of that are at all.

DR. NETON: We're issuing an 83.14, I think, no, it can't be an 83.14, I think it's an 83.14. Since it's changed, and, Jenny, you might know more about this than I do, but since it's changed facility designation, since it's already an SEC class for the AWE portion, then it becomes a DOE facility.

That opens the door for contractors to become eligible. So that's currently ongoing behind the scenes now, trying to, I think, develop an 83.14 case for the new DOE facility that it made.

CHAIR BEACH: I thought maybe you hinted at that a little bit at the last --

DR. NETON: Yes, I did, I did.

CHAIR BEACH: So --

DR. NETON: And that's become official. It's going to be a DOE facility, reclassified as a DOE facility.

MR. FITZGERALD: Now, would that

make this moot? I don't know.

DR. NETON: I don't know.

CHAIR BEACH: It depends on what time frame.

DR. NETON: It depends on, yes, the years.

CHAIR BEACH: Yes.

DR. ULSH: Yes, I don't know about the policy, procedural intricacies of how to do this. But it seems to me that if you've got an SEC at Monsanto that covers all workers, then you've got this nine month gap, and then you got a Mound SEC that covers all workers --

CHAIR BEACH: And that's the gap we were trying to fill.

DR. ULSH: Yes, I'm not going to defend that gap.

CHAIR BEACH: Yes.

DR. NETON: I think I said this last time. I'll take this back.

CHAIR BEACH: Okay.

DR. NETON: I mean, this all sort of came about the same time as the redesignation of the Monsanto facility.

It wasn't clear to me what, normally when I bring this up, I think of the context of new designation, but this is different from that. This is the gap designation.

CHAIR BEACH: Right. Well, and it was Joe's recommendation that left me with some thoughts and considerations. So I took some time and kind of thought about closing it and where the Work Group fits into that.

And I just, so I wouldn't miss anything I wrote down some of the concerns or thoughts that I have. And I'm going to go ahead and go through those. And of course, other Work Group Members, please jump in.

So first, on the internal concern: how does this Work Group judge exposure potential where no quantitative monitoring data or source term data exists, okay?

Originally this issue was raised for a number of radionuclide sources for which adequate bioassay data and source term characterization was lacking.

And I know some of this is paraphrasing where Joe's paper took off. Some of the things that I wanted to highlight, the road map was developed as a response.

NIOSH has stated numerous times, and I'll emphasize numerous because Brant has on many occasions, that their interpretation is that the road map provided a useful guide in D&D efforts to determine what radionuclides should be considered for monitoring workers.

SC&A did disagree with this interpretation. And I honestly disagree with that interpretation as well, based on discussions years ago and how that was actually brought to the Work Group.

Can NIOSH explain how Mound's laboratory internal dosimetry program technologically and recordkeeping could have

stood above the other labs in the '50s and '60s?

And that goes back to Joe's report, just kind of categorizing. Los Alamos has an SEC from '43 to '75. Livermore, Ames, Brookhaven, Sandia, all those labs all have SECs during that time period.

So the question remains, and I know Joe stated this, but how does Mount stand up above?

The other question, this exact question came up in Randy Rabinowitz's ten year review.

In it, Randy points out uniformity issues among different sites, a difference in results across SECs when the petition requires NIOSH to bound internal exposure to radionuclides other than uranium.

Seventeen SECs have been granted. And I'm just taking a snapshot of Randy's report, which I'm sure you've all read.

NIOSH could not bound internal

thorium or other exotic exposures, yet in at least three instances, NIOSH has concluded that it could use internal uranium doses to bound thorium doses.

Mound was listed as one of those three examples. So the question for the Work Group is: do we accept the recommendation to close this?

And I guess I'd throw that out because those are my concerns on this issue. And there's a lot of years they're looking at.

DR. ULSH: Do I get a chance to respond to that?

CHAIR BEACH: Sure.

DR. ULSH: Basically, I'll give you my position as the SEC person on Mound because I was not involved with LANL or Sandia or any of the other sites.

CHAIR BEACH: I understand.

DR. ULSH: And I was not tasked with responding to Randy's report, either. I'll leave that to Jim. My position is Mound

was a pretty good site in terms of the radiation protection program.

But I take issue with the premise that it's head and shoulders above the other facilities.

I think they were, by and large, all pretty good. It depends on the site, it depends on the data that you have there, what kind of activities were being done.

At Mound, for example, with thorium, they had a urinalysis procedure and they applied it in a scale that seems to me to be commensurate with the activities that were there.

Like I said, I haven't been involved with those other sites. If there was the exact same situation at LANL and had I been in charge, maybe I would have argued it the same way, I don't know. I don't know what the particulars are at those other sites.

But all I can tell you is, from the specific situation at Mound, the specific

data that's available there and the specific materials that are available there, we have laid out technical approaches for how to do dose reconstruction.

So I won't talk about Randy's report. That's not something that I've dealt with. You know, Jim, I don't know if you want to make any comments either.

DR. NETON: Not at this time.

CHAIR BEACH: Well, and I guess the Work Group needs to make a decision. We do have some open items, we have some expected items back from NIOSH.

And SC&A is going to give us something on the thorium paper. So I guess my recommendation would be, we are going to schedule another meeting, is to hold those open for the next meeting.

But then I would suggest not closing the issues and taking them before the full Board. That's my recommendation. Other people may have different ideas on the Work

Group.

But I just wanted to get what my thoughts were thrown out before the very last meeting, hopefully. Before June's full Board.

DR. NETON: That very last meeting, I've been saying that for half a year.

MR. FITZGERALD: Is there a sense when this last meeting is roughed in?

CHAIR BEACH: Well, I think right before break we were talking about the end of May, first of June.

MR. FITZGERALD: Early June?

CHAIR BEACH: But we're going to try to shoot for the end of May, right? Is that --

MR. KATZ: End of May or early June depending on when SC&A and if there are deliverables from DCAS by the end of this meeting, as to when you can deliver those so that we have plenty of time in advance and no one's dealing with having had a paper only for

a week.

CHAIR BEACH: Right. The key is to have a time to answer those White Papers as they come out, so we're not left where we are at this point.

MR. KATZ: Right.

MEMBER ZIEMER: A couple of comments. One, indirectly I guess, speaks to Randy's comment. I think suggesting that there would or should be uniformity across the sites is simply not the case.

In fact, one of the things we saw in the Tiger Teams was lack of uniformity across the sites in virtually everything. Part of it's a not invented here syndrome or something.

Sites like to do their own kind of dosimetry for many years, their own instruments, built them and used them. There was almost competition between the sites on how you should do things.

So I wouldn't accept that because

some site did or didn't have a particular program, another site would or wouldn't have that. I think there was a lot of differences in sites.

So I know that Randy kind of implied that there might be this uniformity, but I'm not sure there is. There was a lot of sharing.

I know they've had groups that shared how they did things, and often went back and, you know, protected why theirs were better.

CHAIR BEACH: I guess, help me out, Randy's report wasn't really speaking to what was done at the sites, but how NIOSH does their reconstruction.

MEMBER ZIEMER: Oh.

CHAIR BEACH: That's kind of where I was getting at, I think.

MEMBER ZIEMER: Well, I think the implication was if they couldn't do thorium here, they shouldn't be able to do it there.

CHAIR BEACH: Okay. I understand.

MEMBER ZIEMER: But what I'm saying is: I don't think that necessarily follows, the fact that these sites weren't doing thorium in a certain way that this one couldn't.

And so, but I don't want to push that any further than to say I don't think it follows that that would necessarily be the case.

I'm trying to understand the suggestion on filling in the gap and how that fits in with the rest of the opening and closing of items here.

CHAIR BEACH: Well, that gap's been discussed for several --

MEMBER ZIEMER: No, I think NIOSH is saying let's go ahead and deal with that.

DR. ULSH: Well, we had talked about, we're going to have to address the situation with the radon class for the years where we don't have the log books. We're also

going to have to address this gap period.

And layered on top of this is whatever the Working Group finally decides. I mean, if you guys, I don't even want to speculate. But there are actions that you could take that would preempt a lot of that.

And if you wind up doing it, there's no sense in having these discussions. So we're kind of, I don't want to say that we're waiting to see where the dust settles, because that's not really true.

But I think we are talking about going ahead with this radon class adjustment. At least, we've proposed to do it.

DR. NETON: Well, just for the years.

DR. ULSH: For the years where we don't have, and I just don't know how we're going to fill that gap. I don't know what the procedures are for the '49 issue.

CHAIR BEACH: Well, and that's the topic because be brought it up a year ago and

we were left with the same sense that NIOSH was going to look at that and would report back now. So it's just kind of in the balance.

MEMBER ZIEMER: Right. And then as I understand it, Joe, on the big adequacy issues, you're okay with the second one on the use of the gross alpha.

MR. FITZGERALD: Yes, yes.

MEMBER ZIEMER: So the other one has to do with documenting the decision on when or when not to do the bioassays, I guess. Is it mainly --

MR. FITZGERALD: Yes. I, like Brant, hesitate to dive into that pool.

MEMBER ZIEMER: No, no. I don't want to re-discuss it. But there's kind of an understanding that this is how you would do it. But was it actually done? Is there any way to --

MR. FITZGERALD: We've been grappling with the legitimate question, which

is, you know, in the absence of routine bioassay information --

MEMBER ZIEMER: Right.

MR. FITZGERALD: -- how do you demonstrate exposure potential? And very early on, the King report was a nice convenient ring to grab. But it turned out there were some questions about its intent.

Did it really identify these nuclides by room? Just for the sake of sort of signaling to D&D folks that, just watch out for these nuclides. Or did it actually connote some recognition of potential exposure in those rooms?

And, you know, stepping back from it, there wasn't any good way to resolve that. You know, just looking at the words and trying to figure out, you know, what the words meant without having, you know?

And we did interview various people and we got sort of, you know, we did get input back.

But in the end, you know, my sense was, given the stakes involved, because you're talking about a fair number of years in terms of an SEC, I can accept the fact that, you know, having some corroborating information that would be hard information would be something that --

MEMBER ZIEMER: As to why you did or didn't?

MR. FITZGERALD: Yes. And you know, but without any operational information, the frustration is it's very hard to come up with corroboration over as long as two decades.

And that sort of raises this question that remains. That, you know, okay, we couldn't find the smoking gun in the way of actual there was exposure here that should have been routinely monitored but was not.

But on the other hand, you know, certainly EEOICPA was always directed toward trying to address gaps in recordkeeping and

dosimetry. And so that would suggest the struggles.

I mean, you know, we need to have something hard to explain away these years. And, you know, I think it was a legitimate debate on that. I mean, it was a lengthy debate, a frustrating debate.

But it was a legitimate debate how you do that when you don't have good quantitative information.

And in the end, I think, we sort of paint ourselves in a corner where yes, I think we could continue to do this give and take, but actually without some good site specific quantitative data to corroborate what the King report might have been suggesting, it just wasn't going to lead to a conclusion.

And I think we owed the process some conclusion that, you know, if we can't do that, then let's just close it out. But you know, it is a tough one. It is a tough one to actually deal with exposure potential. I mean

--

MEMBER ZIEMER: Well, and I guess I'm asking what does closing it out mean in this particular case?

MR. FITZGERALD: I think my recommendation was you know, there wasn't any technical solution or pathway for this issue. And we've just about tried everything we could try.

And I'm willing to accept that the corroborating evidence that we were seeking just didn't seem to be available and therefore, recommend to the Work Group that we close the issue out. And that's pretty much what this memo says.

MEMBER ZIEMER: Right. But the result in closing that is what in terms of SEC?

MR. FITZGERALD: Accept the Evaluation Report as written.

CHAIR BEACH: For all internal.

MR. FITZGERALD: For internal

dosimetry.

MEMBER ZIEMER: To accept the ER and not this.

MR. FITZGERALD: Right, right.

MEMBER ZIEMER: Okay. I wanted to make sure I understood that.

MR. FITZGERALD: Right.

CHAIR BEACH: With the exception of what we're working on. Tritides, thorium.

MR. FITZGERALD: Yes, thorium, tritides --

CHAIR BEACH: Polonium.

MR. FITZGERALD: -- polonium in the early years. And again, there's some specific issues attached from these previous data adequacy ones.

But again, that's almost more in the line of a matrix of, you know, are these loose ends tied? Less fundamental questions, but more of just making sure those are real.

So really, it's tritides, polonium in the early years, and thorium which are the,

sort of, remaining issues.

MEMBER ZIEMER: Okay.

MEMBER CLAWSON: I would just like to add a comment on Paul's earlier comment about that it was not unusual to be able to see different sites having different monitoring programs.

And I think this is really the root of the whole issue. And this is why they went with one site wide in the later years, RadCon manual, because you look at the places like Hanford, basically they worried about plutonium.

But they could have cared less about uranium. And I think this is kind of what has got us into this issue.

And because I somewhat, and no disrespect, Brant, I chuckle when I hear the terms robust monitoring programs and stuff, but we didn't monitor for this whole broad radionuclides that we had.

So in that context, I just, I

would have to agree somewhat with Randy on this. I think yes, it's not unusual to see this, but this is in the context of when we go back to monitor or redo for them.

I see a whole different way of doing things. I see different things and I think really with what you've said is true, this is why we are where we're at here, because they didn't have a routine program.

So I think that's kind of part of the issue is that.

CHAIR BEACH: Well, I have an issue because there were gaps in the data. Most of the stuff that we have is after 1990.

MEMBER CLAWSON: And I know today's -- but we still have gaps in the programs today. And we're still trying to work them out even today.

And so to be able to say that we can go back, I really, really have a hard time with that.

MEMBER ZIEMER: Of course, and

keep in mind that none of this information was collected for the purpose for which we're using it anyway.

MEMBER CLAWSON: You know, Paul, that is really part of the problem is a lot of this is, and don't ever think that I'm saying that the health businesses didn't do a good job.

You know, I look at how come the health physicist program got started, and really it's because of all these DOE sites that slowly got connected together and actually sharing the information that they're learning from some of the sites that was classified and everything else.

But it was in a forum where they could. But as any of us know, you put in a room a scientist or a health physicist, it doesn't matter, and you're going to have a lot of different ideas of how it's going to go.

And I never want anybody to think that I'm degrading that they did a brilliant

job. They did the best job that they could with the information that they had at that time.

You look over the last few years of what they had learned of the daughter products and everything else and how it really affected a lot of people, and I think that they were doing the best job.

I've been criticized that I'm knocking them. And I'm not in any way. But really the information that was pulled for this that we're using right now was really not designed to be able to do what we're doing right now.

So we're making a lot of judgments and assessments and assumptions. And we've got a saying, but I hear you can't say it about assumptions, because they make fools out of a lot of us sometimes.

So I do believe this is why we're at the program. And I don't know what else more we can do with that. But I don't want to

see it closed. So I think that's part of the root of the issue.

MR. KATZ: I guess another perspective to take in terms of Joe's issue of corroborating, lacking corroborating information for some of these other radionuclides and very particular situations is down the road, I mean, if people come forward and say I was involved in this operation involving X, Y, or Z, that might be the time when you get corroborating information that in fact, there was an operation that wasn't monitored for these items that right now, you only know as possibly having had exposure potential.

But so, you may see an 83.13 or 83.14 down the road on one of these items that you don't have information on right now.

CHAIR BEACH: Okay, any other comments? So I'll just leave it with the action items. I will go forward with the memo answering the open items.

A brief memo is what we talked about last year on this attachment to Joe's report. And that includes if you know something about the polonium. I know you don't have any idea when DOL's going to come out with that. And for us to do something in advance of that --

DR. NETON: It's out. I just checked the website and --

CHAIR BEACH: Oh, it is.

DR. NETON: -- it's listed as a DOE facility.

CHAIR BEACH: Does it give the years?

DR. NETON: Yes. I'm assuming we're talking about the Dayton Project, right? Early years. It says '43 to '50, it was a DOE facility.

CHAIR BEACH: Oh. So that covers the time period we're addressing. Okay, so --

DR. ULSH: Well, it does, but what if you have someone who shows Mound employment

and --

DR. NETON: See, Mound was covered from '47 to present.

DR. ULSH: Well, it's a covered facility. The SEC doesn't start until September of '49.

DR. NETON: '49.

CHAIR BEACH: Yes, right. And then '59 to '80 for the radon. So the actinium and thorium and radium.

DR. NETON: Are you talking about someone who would have worked --

CHAIR BEACH: February 1st, 1949 to September 30th at Mound.

MR. FITZGERALD: At Mound versus --

DR. NETON: It's almost an employment identification issue bundled up within this. I would have to go back and restudy this in light of this new DOE class and what it means.

MEMBER CLAWSON: Because of that

change, maybe if, I'm not saying this next Board meeting, you can give us an update on that.

DR. NETON: Yes, I can certainly give you an update of where the 83.14 is. But I'm wondering if this is not the time to do something. As long as we're doing an 83.14 for the, let's say the Mound issue, not --

CHAIR BEACH: Well, there's an SEC at Monsanto that covers the individuals from there. That's just that time period between when Mound took over that operation is what I remember. So that was just those people fell through that gap there.

DR. NETON: Mound's current Mound SEC starts in '50, is that right?

CHAIR BEACH: No, '49.

DR. NETON: '49.

DR. ULSH: September of '49.

DR. NETON: Right. And the basis for the polonium program.

DR. ULSH: No, the basis for the

Mound was the radium, actinium, thorium separation.

DR. NETON: Right, that's correct.

CHAIR BEACH: And this was for the fission activation products associated with polonium process at Mound during both of the extended -- excluded period, which is what was written up in Joe's paper.

It's something Kathy brought up a couple years ago.

DR. NETON: Yes, I remember. It's just I keep --

CHAIR BEACH: I remember her kicking it around.

DR. NETON: -- having to relearn it because I think about it and then the ball gets dropped.

CHAIR BEACH: Yes, so we took it up as an action, I think, at our last meeting.

DR. NETON: Well, we're going to have to go back and, let's see if I can get there.

CHAIR BEACH: Okay, so that one --

DR. NETON: That one's considered open.

CHAIR BEACH: -- we'll hold you to it this time.

DR. NETON: Yes, hold me to it next time. And we'll accommodate this.

CHAIR BEACH: And then there's just a couple in the attachments. Some of these are addressed by the thorium or the tritium. I think there might be a couple that --

MR. FITZGERALD: I updated it as of January, but obviously thorium is now --

CHAIR BEACH: Yes. So I don't know if you would want to update this or just work on this.

MR. FITZGERALD: I think, you know, thorium may be the one that was a little outdated. But you know, I would just say take a look at it and see if it's --

MEMBER ZIEMER: On you tables, are

you talking about the tables?

MR. FITZGERALD: Yes. There's an attachment.

CHAIR BEACH: The attachment.

MR. FITZGERALD: And that came from actually an earlier report, SC&A 2010, which is referenced. And I just updated that original table. It's now outdated again, of course, it's three months ago.

CHAIR BEACH: And I know you got to the recommendation and wanted to quit, but I wanted to drag a little more out of you.

MR. FITZGERALD: Could put it in the body of the report.

CHAIR BEACH: Okay, anything else? Shall we start our lunch break early before we get into radon? Does anybody have any objections to that?

DR. NETON: No.

CHAIR BEACH: All right. I don't. So an hour? Get back at --

MR. KATZ: So 1:15?

CHAIR BEACH: Well, let's just make it 12:30, since that's what we had stated earlier. 1:30.

MR. KATZ: Oh, 1:30.

CHAIR BEACH: 1:30.

MR. KATZ: Thanks everyone on the phone. We'll reconnect after lunch. Bye.

(Whereupon, the above-entitled matter went off the record at 12:15 p.m. and resumed at 1:29 p.m.)

MR. KATZ: Good afternoon. We're reconvening the Mound Work Group after lunch break. Phil, can I check, are you still there?

MEMBER SCHOFIELD: Yes, I am.

MR. KATZ: Are you back again, I should say. Great. I think you can get started.

CHAIR BEACH: Yes. I'll go ahead and kind of give you a brief of what's happening the rest of the day while we wait for Mel to get back in since he's the one

that's going to lead this discussion.

We're going to talk about radon. We're going to start with Mel, who wrote the -- well, no, Samuel, excuse me, Samuel, latest White Paper for NIOSH. We will then talk about the interview notes and open it up for Work Group discussions at that point.

After radon, we'll go ahead and if there's any workers on the line that would like to make comments, other than the Work Group Members, we'll go ahead and have some time for that.

So, Mel, are you, or Sam, going to start?

MR. KATZ: Brant.

CHAIR BEACH: Brant, you're going to. Thank you. Okay. Excuse me.

DR. ULSH: Yes. It's me again.

MR. STIVER: He's going to be the choo-choo train master of ceremonies today.

MS. LIN: That's actually really funny.

DR. CHEW: That's good? You're the only one that caught it.

DR. ULSH: All right. So the radon issue. This has been going on for, oh geez, four years now, and basically it started with an interview that SC&A conducted a number of years ago with a few people, and based on that, there was some concern on SC&A's part about where the tunnel underneath SW-19 ran, whether or not it went on into R Building and, therefore, posed a potential exposure pathway for people in R Building or not.

We've gone through a number of iterations on this. First of all, we looked at the interview notes, since this was before the time that we did joint interviews, and we followed up with one of the interviewees and got a number of clarifications about where the concern that the tunnel might have gone into R Building came from.

He didn't say explicitly that it had, but it was just kind of an

interpretation. Then I talked to a former worker who had actually been in the tunnels for a particular project that he was involved with, and he indicated to me that the tunnel did not go into R Building.

And then we went over to the Mound Museum collection of drawings and pulled out original blueprints for both R and SW Building that showed that, in fact, the tunnel did not go into R Building.

So I thought we were done, but then the concern evolved into, well, could radon have leaked from the tunnel and been picked up by the building ventilation system and circulated throughout R and SW Building that way?

So then we went back to the Mound Museum drawings collection and pulled out ventilation drawings. And we gave those to the Working Group in Germantown on January 6th, and some concern was expressed at that time that perhaps the ventilation systems for

the two buildings may have been interconnected and could have presented an exposure pathway.

So what has happened between January 6th and now is that I asked Sam Chu, who is a licensed mechanical engineer, to sit down with the ventilation drawings and determine to what degree that's a plausible scenario.

Well, long and short of it is, and really, this is kind of common sense with how you design a building where you're going to be conducting radioactive operations, you really don't want a system that's going to take air from one laboratory where you might have an accident, a contamination incident that introduces radioactive contamination into the room air, and then a ventilation system that would suck air out of that room and spread it all around the building.

That kind of defies common sense. That's not what you would really hope for. Instead, you would want the exhaust system to

run that room exhaust air out of the building so that any contamination is not spread around the building. Of course, you'd run it through filter banks to remove contamination.

And in fact, what we saw at Mound is exactly what the workers have told us, and that is that the individual laboratories or rooms were kept at negative pressure compared to the hallways, and the hallways were kept at negative pressure to the outside.

So the whole building was kept at negative pressure so that any contamination incidents wouldn't push contamination out of the rooms into the hallways and out into the environment; rather, air would be sucked in from outside and vented through filters through the exhaust system.

So the long of short of it is, Sam looked at the different pressure differentials across the various areas of the R and SW Building, the tritium complex, and found that it's just not plausible that the ventilation

system would have served as a route of circulating radon from the tunnel and under SW-19 throughout the building.

So that's kind of where we are with that report. Now I'd like to draw an analogy just so we can all be clear on what we're talking about here because I know you all are considering whether or not the Class needs to be expanded.

Can anybody smell anything? Like, vinegar? You know, that's kind of my point because when I came in this morning --

Mr. KATZ: It was a trick question.

DR. ULSH: It was a trick question. I brought in a little jar of vinegar, which, if you're sitting here, you can smell it now, and I had it sitting in my lunch box with it cracked open.

Now, like any analogy, this is going to be limited. I mean, there's going to be differences, but let me kind of draw a

picture for you.

What we know is that a particular individual was sitting in SW-19, which is an access-controlled area. People don't just wander in here, even the interview that you conducted last week said that, and at his desk, he was sitting there, and he showed up with a strange whole body count.

And that's how they discovered that they might have a radon problem. They did some investigations. They tracked it back to SW-19, where his desk was, and right by his desk was some cracks in the floor, and that's how they discovered the tunnel.

Since the room was at negative pressure, it was drawing radon into the room, and that's how he got exposed to radon.

So the question is, well, how do we place people in SW-19? Well, we can't do that. We can't tell you exactly who was in that room and who wasn't, but what we can tell you is that that was an area that was part of

the tritium complex in SW Building.

And anyone who would have been in there would have been on tritium bioassay. The problem with that Definition is that it captures a lot of people who were never in that building -- or never in that room, rather. We just have to accept that. We can't draw the net any tighter than that.

So I think the only remaining question is how adequate is that Class Definition to capture people who might have been exposed?

Well, let me give you, like I said, an analogy. This is the radon source. I can't get to a tunnel underneath the floor so I had to use my lunch box, but if I'm sitting here, I can smell it now. I don't know if you guys can.

But if you were to go out in that hallway, you wouldn't be able to smell it. Why? Well, because of dilution and because the ventilation system would be sucking it out

and sending it outside. It wouldn't be spreading it all around the hotel.

Well, this is also, sort of, an access-controlled room. If you tried to get in here after lunch, it was locked. At Mound, SW-19 was locked. You didn't just wander in there, and you certainly didn't do it unless you were on tritium bioassay.

We've already designated a Class that includes this entire hotel. What you're talking about is expanding it to include the Hampton Inn next door and the Comfort Inn next to that, from this. It doesn't make any sense.

We've already given a very generous Class Definition, and the reason that I crafted the Class Definition in this way is because I didn't want to spend three or four years fighting about whether we've captured everybody.

Well, you can see that that strategy was kind of an abject failure because

here we are today. But I simply don't see any basis for expanding the Class beyond what it already is.

And I'm going to put this away because it stinks.

MR. FITZGERALD: If I can interject, I mean, this might be a good question. We originally addressed this issue. We noted the interviews that pointed out the -- and it was an anecdotal reference to the radon going into, I guess it was, room R-128, as I recall. No dispute there.

And this Work Group discussed it and pretty much concluded that, yes, there was a source that implicated SW, particularly, SW-19, so no argument there either, and with a possibility of it getting into R Building on that one side.

And I think it was NIOSH that came back at about that point in the discussion and, by virtue of the isotopic mix, you know, the radon, thoron, and actinon, and the fact

that it was fairly prodigious in quantity. I mean, a lot of thoron in the tunnel, and what have you, and it's all in the transcripts.

And that was when the SEC Class was first proposed. And I went back and looked at some of that discussion because it's been awhile. And, you know, we were pretty clear that we thought it was SW and R, we've never changed that. We just that, you know, the two buildings were implicated, quite apart from, you know, exactly where the tunnels went, but we thought the two buildings were implicated. And it was made pretty clear at the time, and I think Brant is correct. I think there were some misgivings that it was SW-19 that figured most prominently in the measurements that were taken in terms of potential exposure, but I think Brant raised this back in January 2010, but Labor couldn't construct the Class Definition on one room.

And as Brant pointed out, it had to include anybody who, you know, might have

had access who could, I guess the way to put it, they didn't know who frequented the room, who went in and who went out. So it was sort of left that people that would have access would be included, and it was left at that. At the time, we were concerned, I'm just trying to recreate this, we were concerned that somebody would raise their hand.

I remember having this discussion, maybe a clerical support worker or a maintenance person or somebody who wasn't a hands-on tritium operator that, you know, might not have tritium bioassay in R and SW.

And at that time, I guess there was an individual who was interviewed who made it very clear, that person had pretty good knowledge of the tritium operations, that nobody could enter the buildings without having a tritium bioassay.

And so that, you know, that aspect of trying to have a safety net to capture anybody who might not have a tritium bioassay,

but was in R and SW, that got dropped. And I think it went forward as just being those on the tritium bioassay log.

And that was fine. You know, I think that was the premise where we were coming from and that seemed to address it. So when this thing came back and it turned out that, in fact, there may be individuals in, in this case, R building who did not get a tritium bioassay, that's precipitated this whole discussion.

I mean, certainly, it wasn't on our volition, but certainly on NIOSH's part, this question's been raised. And, you know, there's two elements to it. You know, clearly, one issue is can we somehow clarify, you know, this question of radon exposure in terms of ventilation?

And that was the paper that Sam put together, and before that, actually, in October, I guess the original paper was October, that was issued and this latest paper

is more on the maintenance and ventilation. It addresses that issue.

And at the time, we indicated that it would probably be useful to interview workers who would have some knowledge of whether people from the clean side of R Building could, in fact, have free access of R and SW as well. That was the flipside of the issue.

You know, one was, can radon get to the clean side of R Building, on one hand, and can the individuals on the clean side of the R Building get to SW-19, say? So those are the two issues.

And I think we've been looking at the analyses on the ventilation, and in fact, interviewed 'identifying information redacted' to get, sort of, a person-on-the-floor perspective on that issue as well.

And we have specific questions about the Chu paper, but I'm not sure, in general, we have any very big objections to

the fact that, you know, examples aside, radon would have easily gotten all the way over to the clean side of R Building.

So we can have that discussion, and I think we need to go through some of the mechanics, and that was never an assertion that we had. We just said there was a source of radon, apparently in R-128 got into R Building, and that was the genesis of, I think, including R Building as part of the Class Definition.

So, you know, that's as far as we've gotten. So we have some comments on the ventilation report, and I don't know, who's on the phone? Is Bob? Who's going to handle that? Joe Provecchio? Anybody?

MR. STIVER: I asked Joe Provecchio to call in, and I haven't gotten a response from him.

MR. FITZGERALD: Okay. I didn't hear his name though.

CHAIR BEACH: I don't think we

asked who was on the phone first thing, did we?

MR. KATZ: We asked earlier today, but not since lunch.

MR. FITZGERALD: We may need to call him.

MR. KATZ: I'm sure they would have responded if they -- where is that coming from?

DR. CHEW: I'm going to mute that.

MR. FITZGERALD: Can you call him? I know he had --

MR. KATZ: So, Joe Provecchio, are you on the line?

DR. MAURO: Hi. This is John. I just tried to call Joe, and I left a message for him to call in. I don't know if he's on the line.

MR. KATZ: Okay. John Stiver sent him an email, too.

DR. MAURO: Yes. I just called him about three minutes ago.

MR. KATZ: Okay.

DR. MAURO: You know, if I can help. I did spend some time with Joe going over the drawings and the material. Joe Fitzgerald, did you have a chance to talk to Joe directly about all these matters?

MR. FITZGERALD: No, no, we have his comment, but I just wanted to, you know, as with Ron, I was hoping that he would have the opportunity to interact directly. We're not having much luck today.

DR. MAURO: Oh, sorry. Then you've got more than I have. Okay.

MR. FITZGERALD: Yes. Well, while we're waiting. I mean, we did have an opportunity to interview some people, and one person was a maintenance manager who did work at Mound in the '80s and '90s and was responsible for maintaining the HVAC systems, not only in R and SW, but other buildings at Mound.

And what we were hoping to do is

supplement what we got from Sam Chu's paper by just getting some sort of perspective of his experience since he dealt directly with those systems. And does everyone have a copy of the notes?

MR. KATZ: That should have been circulated.

MR. FITZGERALD: Okay. Yes. And I just want to go over those because we were going to cover that in any case, and this gets into some of the issues that I think both support and, probably, corroborate some of what Sam Chu did.

MS. LIN: Joe, before you go on.

MR. FITZGERALD: Yes.

MS. LIN: I didn't have a chance to review this document for PA purposes, so just refrain from divulging individual --

MR. FITZGERALD: Individuals, okay.

MS. LIN: -- information, not just the names, but specific --

MR. FITZGERALD: Any identifying information.

MS. LIN: Thank you.

MR. FITZGERALD: Okay. So anyway, we were talking about the kinds of activities and he was involved with different aspects of HVAC maintenance and the ventilation systems. And we asked him, basically, were both R and SW Buildings maintained at negative pressure to the outside?

And his answer was yes. And in terms of the actual lab space, the lab space was maintained at negative to the corridors, with some exceptions. I think the note was that, in some cases, you could adjust the relative pressure so that it would flow, actually, out to the corridor if it were the type of operation that required that.

So there was some adjustment needed, but the picture he painted for us was a pretty strong recognition of the status of pressure within the facility and within the

actual lab space. And if there was any aberrations in that pressure, anything that was off-normal activities, would be shut down immediately.

And this is pretty much standard, I think, in a lot of different DOE and AEC labs. So this was no different. So there was assurance from his standpoint that, you know, you didn't have any anomalies or any off-normals that would have led to a pressure gradient that would have given you a different in terms of flow.

The other questions, you know, was the reports on the differential pressure made every day or was this done weekly? He claimed it was done weekly but that they were checked daily. So there was a lot rigorous controls on that.

And were the R and SW Buildings isolated? No. They were isolated from each other. They were independent with their own exhaust systems and, basically, they were

monitored that way.

And we went through and, literally, there were airtight doors, but not the traditional two-door airlocks. And all these are laid out in the notes.

So, in general, I think the picture he painted was that you had a ventilation system that would have likely exhausted radon across the facility such that it would have been less likely that you would have seen demonstrable radon levels on the, was it the west side? The side away from SW.

DR. ULSH: That's the east side.

MR. STIVER: The east side.

MR. FITZGERALD: East side. And so he kind of presented this picture that you had a number of corridors that had exhaust points, and you had monitored pressure, but that the way it was managed, understandably so, was that the cold side, which was the east side, would have been less likely to see air that was flowing from the west side.

So I think that was very helpful, and I think that perspective helped us understand that, you know, the ventilation system was well thought out and controlled, and that's pretty much the configuration that he was familiar with.

Now we also raised the flipside of the question, which is, okay, you know, that was in terms of the radon getting to the cold side of the R Building, what about this issue of workers from the cold side being able to move through R Building and actually move into SW Building. Is that something that was an issue?

And his answer was, yes, that, basically, you could do that. You had to don smocks and shoe covers if you did enter, I don't want to say the hot side, but the hotter, you know, the tritium or radiological side of R Building.

And since everybody there was already wearing smocks and shoe covers, I

mean, you would obviously stand out if you did not, but you, in fact, had a supply of those items at the point, the juncture, where you went to radiological areas and were expected to don those, and you could enter.

But, basically, his claim was there was no restriction. You could certainly do that and he, in fact, did that. We also posed that same question to another individual, who I will not name, just as an aside, just to corroborate whether or not that was the case.

And that individual confirmed that, in fact, that was the case, that really, it was the, you know, standard practice to don these smocks and shoe covers in order to move about R and SW from the cold side.

The rest of it's in the notes, but we did pose some of the questions. Some of these questions, I think, Brant, you've had identified, and we're still waiting for some written responses, but certainly, by the time

this individual was working, this was in the '80s, it appeared that SW-19 was pretty well locked down.

I mean, it was not being used for something, but it was definitely locked down. He couldn't speak about the time period that we're talking about since he wasn't actually working at that time, although, you know, he expected it to be somewhat similar that you could, in fact, be able to move around.

CHAIR BEACH: But the other individual was there during that time period, wasn't he?

MR. FITZGERALD: Yes, but we did not do a formal interview.

CHAIR BEACH: Okay.

MR. FITZGERALD: So there's probably issues that could be raised. So I guess, in sum, I mean, the rest of it's in the notes, but in sum, I thought the discussion with some of the folks that actually worked here, former workers, was corroborative on the

ventilation issues.

That it appeared that the likelihood of a radon movement to the cold side was minimal, or small, but that the likelihood of workers being able to move about from the cold side seemed to be there as far as, you know, it was certainly feasible, it was done, and that's about where we left it.

I mean, there's no indications of how often and how many, but you could, in fact, make that movement. And we were going to interview to get that feedback, so that's about where it stands now.

DR. ULSH: Okay. Well, no one from NIOSH or ORAU participated in that interview on Thursday. I assume it was just an honest mistake we didn't the call-in information.

MR. FITZGERALD: Well, you were invited.

DR. ULSH: We were invited, but I sent an email beforehand because I hadn't

received the call-in information, so I can't -- that's not meant as a criticism, it's just to point out that we weren't involved, so I can't say how the questions were asked or how they were answered and what kind of interpretations were given.

I don't really know. What I can tell you is that we, together with you in many cases, have interviewed four different individuals who worked pre-1980, and I've got nine individuals who worked post-1980, many of whom currently work for NIOSH or ORAU, and they formerly worked at Mound, and none of them have said that you simply walked into the tritium areas without leaving tritium bioassay.

All of them have said there were change rooms between the two areas where the shoe covers and smocks were, and you were expected to leave a tritium urinalysis. I asked specifically was there anyone that was standing there, a guard, making you do that?

No, there wasn't. It was an honor system. That's consistent with what we heard from all the people that we talked to, and furthermore, I asked could you have been in these tritium areas for 250 days, which is what you need to qualify for an SEC, and not have ever left a single tritium urinalysis?

And to a person, all 13 of these people said, no, that's really not plausible. So like I said, I don't know how the information in these notes came to be. I don't know how to interpret it, but it's not consistent with what I've heard from 13 other workers.

MEMBER ZIEMER: Well, that last question wasn't really asked about the 250 days, the individual -- because Josie and I were listening. Basically, the question was asked could an individual enter that area without, basically, being logged in and without leaving a urine sample?

And the answer was, basically, it

was an honor system, as you described. He described the possibility that someone might go there on a break to be with a colleague, into the break room. He specifically talked about that would be an example, that they would, in fact, don the smock and the shoe covers, and perhaps go to a break room.

But the same question occurred to me that, yes, but would the individual do that frequently enough to qualify for an SEC category? You'd have to do it, not only 250 days, I think, you have to -- a break's like 15 minutes, so I don't know what constitutes a day, legally, in this case.

But the question about frequency and could a person, sort of, be there 250 days without being part of that working group, I don't think that was asked. It was more, could a person enter the area. That's how it sounded to me, wasn't it?

Could you enter the area without leaving a urine sample, and the answer was

yes.

MR. FITZGERALD: Yes, you could enter the area and, you know --

MEMBER ZIEMER: And I think he said people did.

MR. FITZGERALD: Right.

DR. ULSH: And, you know, that's consistent with what we heard from the three people that we interviewed at the federal building in Cincinnati that, you know, many people around the table were involved with.

If you were going to go deliver a letter, yes, you could do that. You weren't supposed to, but you couldn't do it 250 days and not leave a single urinalysis sample.

One of the people that I talked to, who works for us now, said, well, yes, I mean, physically, could you do it and get away with it one time? Yes, maybe, but really, the culture was, what you would do is, if you worked in the cold side of R Building and you needed to meet someone from the hot side of SW

Building, the tritium areas, you didn't just walk over and see them.

What you did is, you picked up the phone, and you called them, and you said, hey, meet me at the change room, and I'll hand you whatever the report or letter is.

So, yes, you could pop in for a break, like you said, I think that's consistent. We're getting a consistent story. The question that we have to keep focusing on though is could you be in SW-19 for 250 days without a single urinalysis sample? And I've heard nothing that indicates that you could.

MR. FITZGERALD: Well, the problem I have with that is, you know, when this was originally -- I'm trying to square this with the original discussion on the Class Definition of two years ago.

And, you know, you have individuals in R Building, just on the other side of the wall probably, you know, just on the tritium side of R Building, who, likewise,

may or may not be exposed 250 days, and they just happen to get tritium bioassay.

I mean, the exposure to the radon is founded on the tritium bioassay as a surrogate, the tritium bioassay was the original trigger because that placed you in R and SW Building.

DR. ULSH: Not necessarily.

MR. FITZGERALD: Well, not necessarily now, but it was the reason why that was the trigger because it identified all those who might have been in R and SW because the premise was, you couldn't be in R and SW without a tritium bioassay.

DR. ULSH: Right. You're talking about the mistake that I made and --

MR. FITZGERALD: No, no, but I'm just trying to go back to the reasoning as to why the tritium bioassay figures in this.

DR. ULSH: It was at the Niagara Falls meeting when we decided that there needed to be a radon Class.

MR. FITZGERALD: Right.

DR. ULSH: There were a couple of iterations of the Class Definition, and at that time, Josie in particular and the Working Group in general expressed a concern about, well, would this capture everyone in the R Building?

And at that time, I said, yes, it would, based on what I had heard from former workers.

MR. FITZGERALD: Right.

DR. ULSH: After that, a member of the public pointed out that, hey, in fact, there's this cold side of R Building and you didn't have to be on a tritium bioassay to be in there.

Now we committed at the Niagara Board meeting that if any information was presented to us that indicated that we need to reexamine the Class Definition, that we would do that. And that was the genesis of our October 2011 report.

After the Class Definition was set, information came to us from members of the public saying, hey, wait a minute, it's not the situation that everybody in R and SW Building are on tritium urinalysis, so now we have to revisit the Class Definition, and that's what we did in the October report.

MR. FITZGERALD: Yes. I'm certainly familiar with that.

DR. ULSH: When I said, not necessarily, what I meant, Joe, was, you could be in T Building and be on tritium bioassay.

MR. FITZGERALD: Right.

DR. ULSH: It doesn't necessarily mean you were in --

MR. FITZGERALD: Right, right. And I, sort of, understand that, but what I'm trying to understand though is that, originally, and we talked about using the tritium bioassay as a trigger, we didn't talk about, you know, would these workers who were not in SW-19, would they have been exposed to

radon for 250 days or not. No, probably not.

DR. ULSH: No.

MR. FITZGERALD: I mean, that would not even factor into it. In fact, if you go through the transcripts, that didn't even come up. It was just the recognition that even though SW-19 was probably the only place that you could be pretty darn clear you'd have 250 days of radon exposure, it wasn't possible.

Labor didn't see it as feasible to, in fact, classify a room, even though it was the only place that one could be clear it was 250 days of radon exposure in an SEC Class.

And I think you put it well in that particular meeting, it was indeterminate who could have possibly come in or out of SW-19 at that time, and therefore, anybody who could have had access, would have been included and it wouldn't have come down to 250 days.

It's just this indeterminate circumstance of who had access to SW-19. Labor basically said, we can't take one room, even though that's the room where you're more than likely to have the radon exposure, and classify it as SEC.

You have to take into consideration all the workers who may have had access to that room and could have been exposed. It wasn't 250 days of exposure, just could have had access in and out.

DR. ULSH: Wait a minute, Labor never said anything about the 250 days.

MR. FITZGERALD: No, they did not.

DR. ULSH: That's part of the law. You have to have 250 days of exposure to qualify for the SEC. There was no need to talk about it in that context. It was never the -- Labor's position, as I understand it, and it was certainly never our position, that anyone who spent a single second in SW-219 should be in the SEC Class.

MR. FITZGERALD: SW-19.

DR. ULSH: I'm sorry. SW-19.

MR. FITZGERALD: Right.

DR. ULSH: But, yes, that was never our position. What I'm saying is, the Definition that we grew, based on tritium bioassay, certainly captures anyone who could have spent 250 days in SW-19. It also captures many people who were nowhere near it, but we can't do anything about that.

MR. FITZGERALD: Right.

DR. ULSH: If we could draw a tighter net, we would, but we simply can't. But it was never the case that we were saying, if you spent any time at all, 250 days or not, that would put you in the SEC.

MR. FITZGERALD: But I think you just made my point though.

DR. ULSH: Did I?

MR. FITZGERALD: I mean, you're saying, yes, by virtue of using the tritium bioassay as the trigger, you would, obviously,

sweep in both people that had a pretty good likelihood of 250 days exposure to radon as well as, probably, the vast majority would not have gotten 250 days exposure simply because, you know, they weren't going to SW-19 that frequently.

I mean, you'd have a mix. You couldn't possibly have everybody who had 250 days potential included in that Definition using the tritium bioassay as the trigger. You're going to sweep in a lot of other people who, you know, obviously, by characterization, could not have 250 days of radon exposure.

DR. ULSH: I think we're vociferously in agreement on that.

MR. FITZGERALD: Yes.

DR. ULSH: There are many people who may not have 250 days that are currently in the SEC Class.

MR. FITZGERALD: Right. And the presumption at the time was that the tritium bioassay would encompass all of R, all of SW,

and I agree with you, you know, T Building has nothing to do with this issue, but using that trigger, T Building as well.

Now, in this instance, and going back and revisiting this whole thing, and as you know, I've always said, R Building, in toto, should be included, that was way back when.

Now, we've gone back and reassessed the ventilation patterns to say, well, maybe that was too far reaching and perhaps the original trigger is okay if we can go back and show that, in the final analysis, the radon couldn't get to the workers, or the workers couldn't get to the radon, I have less of a problem with the first.

You know, talking to this individual we interviewed and looking at the analysis that Mr. Chu has done, not you, but Mr. Chu over there, you know, I can appreciate that and I can see the logic in that, however, I'm having more of a problem with --

MR. KATZ: Someone on the line, you're not muted. We're hearing you. Go ahead.

MR. FITZGERALD: I have more of a problem with the other notion, which is also a premise for the other Class Definition that somehow these workers who are on the clean side of R Building who, you know, just didn't get tritium bioassay, have to meet a 250-day test when that wasn't a test for the workers that were swept in in the T Building and, certainly, the rest of R Building.

Maybe I'm missing something.

DR. ULSH: Yes, you are. They don't have to meet the 250-day test, except for they have to be employed for that long.

MR. FITZGERALD: Right.

DR. ULSH: They have to meet the test of having a single tritium urinalysis, just like everybody else. That's it. If you went in one day and you left your tritium urinalysis, you're in the Class. It's

exceedingly generous.

MR. FITZGERALD: But if you had --

MS. LIN: Wait, hold on just a sec, Joe, I'm trying to understand your point here, are you trying to make an equity argument because the Class is too over-inclusive for a population of people that shouldn't be included in the Class, then we have to do the same for the people who didn't have radon exposure in the cold side of R Building. Is this a equity argument that you're making here?

MR. FITZGERALD: No, no, not equity argument, just the discussion where this is hinging on whether individuals who were thought to have been tritium bioassay, but as it turns out, were not, are now ineligible for the Class that was defined because they could not have been exposed to the radon in a way that is consistent with the individuals elsewhere in R and SW Building.

And I'm just saying that if one is

looking at whether radon got to them or they got to the radon, I think in terms of access, they certainly have access. I'm just trying to figure out, what's the distinction?

MS. LIN: So actually, it's a question about whether the Class Definition wrongfully excluded people who should be in the Class. And it seems that hearing from NIOSH and the interview that that's not the case because the radon stopped where it stopped, right?

So under the regs there are two types of exposure, one is chronic, 250 days, which is the Class Definition here, versus one's acute, at a high level, criticality level, okay? Like, critical incident level. So that's not that Class here, right?

MR. FITZGERALD: Jenny, but the exposure, and we've talked about this, exposure is not just simply being in an environment and the, in this case, the source term, the radon, reaches you and presents the

hazard. If you --

MS. LIN: Right, visit it --

MR. FITZGERALD: -- can, in fact, and this is the point that, I think, Labor made, if you have free access to SW-19, and you're not restricted, and this was one of the premises. You know, we had an original premise that you couldn't even get in R and SW without a tritium bioassay.

That proved to be wrong, okay? We have another premise here that the people on the clean side of R Building couldn't enter the hotter side of the tritium areas at R and SW without a tritium bioassay, okay?

We demonstrated that, you know, they can, in fact, enter and, you know, if they were to judge themselves to be in the vicinity long enough, they would be on their honor to leave a tritium bioassay, but I think that's, again, a judgmental thing. I think it's not something that the program provides for.

DR. NETON: Joe, I think that same argument applies to the original Class, whether you put that bioassay station at the door of SW or the door of R Building, it's still, we've all known all along it's on an honor system. No one ever said that this was a guarded, you know, station where people, mandatorily, had to do it.

That's been known from the beginning.

DR. ULSH: Yes. There's people from PP Building --

DR. NETON: I mean, so really, the only difference I see is, where's the location of the tritium monitoring station? Is it the door of the R Building or the door of the SW Building? That's the only thing that's changed.

MR. FITZGERALD: Well, and I think, retrospectively, we're trying to go back and redo the analysis to show that -- and we didn't go through the R Building analysis

because at the time it was felt that the original Class took care of it.

I'm just concerned that when we go back that, you know, before we draw a line that says, you know, people just did not mingle and there was no issue, and we said we would, in fact, interview workers to ascertain that, that that is a factor in looking at exposure retention.

Were these people able to move about R and SW or not without a tritium bioassay? Now I think that's somewhat open at this point.

DR. ULSH: Well, I think I've stated our position pretty clearly. It's simply not plausible that someone who should have been exposed in the Class, 250-day is not part of the Class Definition, it's simply part of the SEC Regulation.

Someone who could have been exposed to the radon in SW-19 --

MR. KATZ: It is part of the Class

Definition, wasn't it?

DR. ULSH: Pardon?

MR. KATZ: It is part of the Class Definition.

DR. ULSH: My mistake. I'm starting to speak --

MR. KATZ: It's integral to the Class Definition.

DR. ULSH: All right.

MS. LIN: I'm sorry, the 250 day is.

MR. KATZ: Yes.

MS. LIN: Okay.

MR. KATZ: It's integral to the Class Definition. Go ahead.

MS. LIN: Sorry. Go ahead.

DR. ULSH: So we all agree that there are people currently in the Class who probably don't, definitely don't meet 250 days of exposure to radon. We know that, and we're in agreement on that. I'm saying, that's okay. That's the best we could do.

The real question is are there people who are not currently in the Class who should be, and that means they had 250 days of exposure to radon. I'm saying, if they did not leave a single tritium urinalysis sample, it is simply not plausible for them to meet the conditions of the Class. It's simply not.

Is it physically impossible? No, of course not. They could have -- each and every day for 250 days they could have snuck in, pressed their nose up against the crack in the floor in SW-19. There's nothing physically --

CHAIR BEACH: They didn't have to sneak in though. They could have just wondered in and out based on our interview.

MS. LIN: Well, okay, I mean, I think that's fine, but I'm just wondering, have we actually located a claimant who was, like, how you guys described, and wasn't added to the SEC?

CHAIR BEACH: Yes, I think we

have.

MEMBER ZIEMER: Well you would add everybody on the other side of the wall. See, to me, unfortunately, this looks an awful lot like a couple of other cases. One is General Electric in Cincinnati, and another is the Oak Ridge Hospital where we end up like -- see, my problem with it is exactly what you say, the 250 days.

At GE, is it likely that someone in the other side of the plant would go into the one building where they had the material and spend 250 days there? No, but Labor says we can't administer that.

And you may recall, I said to the Labor people, why don't you require the claimant to give an affidavit? You've got a guy that says I went there every day for 250 days, make him give an affidavit to that effect, and we'll believe it.

Labor won't do that. Do you know why? They said everybody lies. She said that

in the public meeting.

CHAIR BEACH: Yes, she did.

MEMBER ZIEMER: She said it in the public meeting, to get $150,000, all of the claimants will lie.

DR. ULSH: I am staying miles away from that one.

(Simultaneous speaking.)

DR. NETON: Well, Paul, this is a little different in the sense that we have at least a requirement that they leave a bioassay sample to be on the record if they were in the --

MEMBER ZIEMER: I know, but we also had people that say you can go in there without that.

DR. NETON: But not for 250 days though.

MS. LIN: But, Dr. Ziemer, as of now, there's a Class been established, that has been in effect, and the DOL has said that they could administer this Class as it's

written.

DR. NETON: They have been administering it as it's written.

MS. LIN: Right. So then if there's another claimant or another --

CHAIR BEACH: There's actually a group of claimants that fall through.

MS. LIN: Okay. And I think then, you know, that that's a separate question then, because that means we have an existing SEC Class that needs to be --

MEMBER ZIEMER: Or you mean, if someone from the other side says that they --

CHAIR BEACH: They worked there and didn't have a tritium bioassay.

MS. LIN: That's right. Then does that merit another SEC petition from this group of people?

CHAIR BEACH: The iron workers.

DR. NETON: What's that?

CHAIR BEACH: The iron workers.

DR. NETON: The iron workers?

DR. ULSH: All right. Does this go back to the MESH report? Because that's a different question entirely.

DR. NETON: Because according to this last person that was interviewed, I thought he said that if you were doing work in there, like construction-type work, you would definitely be on an RWP and required to leave bioassay --

MEMBER ZIEMER: Yes, work permit, right.

CHAIR BEACH: He did say that if you were on a work permit.

MR. FITZGERALD: If you're on a work permit.

CHAIR BEACH: But he also stated you could go in and out, and people did, without leaving a bioassay.

MR. FITZGERALD: Just to meet people in break rooms, and have lunch, and stuff like that.

DR. NETON: Well, agreed, but for

an entire work year, I side with Brant on this one, I find it hard to believe that for an entire work year, when there's a requirement in place like that, you would have to, essentially, be stationed there for a work year without --

MR. FITZGERALD: Well, that's kind of why I went back to the transcripts because when this came up, that would have been the rationale for the first SEC Class Definition.

But I think going back to what Paul was saying, and it's on Page 335 and 336 of the January 5th, 2010 transcripts, Brant came back and said Labor would not allow it to be defined this way because it's indeterminate who would be in and out for how long.

It was just framed in a way which suggests that it couldn't be restricted that way. And I'm just saying I'm not sure if we need to ask Labor again.

DR. ULSH: What I mean, well, since I'm the one who apparently made the

statement.

MR. FITZGERALD: Yes.

DR. ULSH: What I meant when I said it was, if we sent a Class Definition over to Labor saying, SW-19, Labor would kick it right back to us and say, we can't do this --

DR. NETON: For exactly the same reasons GE and --

DR. ULSH: So we crafted a Definition with Jeff Kotsch in the hallway outside of the, I ran this by him in the hallway outside of the Niagara Board meeting. I said, okay, well, what if we make it, and whatever the current Class Definition says, 250 days, one tritium urinalysis, and they haven't had a problem with administering that one. That's why we went with it.

DR. NETON: See, to me, the precedent is set. I mean, a Class has already been added based on that criteria. That's already been approved by the Secretary. The

question is whether or not there was potential exposure to radon in the R Building that is now uncovered exposure, okay?

And I think that issue has been addressed. And I hear SC&A --

MR. FITZGERALD: Yes, but I guess my question, maybe this is more for Labor and maybe this gets to what Jenny is pointing out that, you know, this is sort of a construct of what they would accept.

You know, either this is indeterminate in terms of access and you can't get into test as to whether, you know, not only did they have access, but did they have enough access to warrant, you know, inclusion, around 250 days, I mean, this is sort of what you were saying with GE.

DR. NETON: But see, Labor has no say in the 250-day requirement. That's not part of their --

MR. FITZGERALD: Well, I guess I misunderstood you in what you were saying.

MEMBER ZIEMER: Well, I think I would suggest --

MR. FITZGERALD: You were positing that.

MEMBER ZIEMER: I was saying, Labor, if you have someone that says I wandered into this building, have them give you some kind of an affidavit saying that, you know, if they did it one time, that's no big deal, but maybe if they did it every day for 250 days, and spent a lot of time there, or even weight it by hours if you want.

But, you know, if I went into that building every day for the ten years I worked there, that's very different.

MS. LIN: Can I just say that, from what I'm hearing, no one has a problem with the radon Class as it's written now, but SC&A, and it seems like some of the Board Members, are concerned about a group of worker who may have potential exposure to radon who are excluded from the Class.

What I'm saying is, there needs to be another solution, maybe, if the Board Member wanted to go down that path, but this radon Class stands, okay?

MEMBER ZIEMER: It exists, yes.

MS. LIN: Does that make sense? It exists, and it is here now. We obviously have to follow through with the regulations to find another solution if there really, indeed, is a problem.

CHAIR BEACH: So the reason this is open is because NIOSH is proposing to expand the Definition to include all Mound workers from September 1st, 1972 through December 31st, 1972 and for January 1st, 1975 through December 31st, 1976.

That is why we're discussing this within the Work Group again.

MS. LIN: I'm sorry, I don't --

DR. ULSH: Yes, that's accurate.

CHAIR BEACH: This is the White Paper that started all -- so this is what

started all this discussion, Jen, and got us into the ventilation again.

DR. NETON: Well, no, no, Jen, what started the discussion was the fact that people who worked in the R Building were not monitored for tritium. That's what started this whole issue.

CHAIR BEACH: Well, they were using the log books, and there were people that were missing. There was two log books.

DR. NETON: No, no, no, two separate issues there.

CHAIR BEACH: Okay.

DR. NETON: The first issue that started was, we became aware that there were claimants who worked in the R Building that never left a bioassay sample, that came through, I mean, I saw the dose reconstructions, and it's true.

CHAIR BEACH: Was this previous to the SEC?

DR. NETON: Once the SEC was in

place, we became very much aware that there were people who worked in the R Building that never left a tritium sample, so how can that be? They were all supposed to leave tritium samples?

On our subsequent investigation it was determined that people in the R Building were not required to leave tritium samples.

DR. ULSH: Well, people in the cold side.

DR. NETON: In the cold side, yes. And so that started this. At about the same time, though, this issue of the missing year, or so, of the log books surfaced, but that's a totally independent issue. We would have to address that either way.

I mean, we don't have the full log books. We don't. I thought we did. So that needs to be fixed. The R Building issue is a separate issue. And, again, the question in my mind was, if the Class stands, the only remaining question then is, was radon present

in the R Building that would expose these people and should they be in the Class, and if so, then the Class needs to be re --

MR. FITZGERALD: I thought I understood this until he started talking about -- you know, the Class is what it is. It stands now. And so, you know, administratively, you know, we raised this to Stu Hinnefeld before, we're not quite sure what we're doing.

But I can almost understand what Jenny is saying that, certainly, one avenue is to, you know, have those people petition since it appears that there's a segment excluded from the Class after all, I mean, that would be another avenue, I suppose, as opposed to going back and actually trying to re-jigger the basis for the standing Class.

MS. LIN: No. We wouldn't be able to do that anyway.

DR. NETON: No, the standing Class, I think, is done.

MR. FITZGERALD: Is done.

MS. LIN: So we're on the same page.

(Simultaneous speaking.)

DR. NETON: Anyone who left a tritium sample is in the Class.

MEMBER ZIEMER: One thing I like about the current situation is this, that, originally, we thought the Class would be in that room for the radon, and Labor couldn't do that, so we expanded that, even though we're saying, they really can't get radon exposure out here in the break room.

Now, if we go in the direction we, sort of, were heading, now we're putting the person in a break room and saying they're entitled to be in the Class for radon exposure, which we don't believe is even there --

MR. FITZGERALD: But, you know, I'm more comfortable, you know, if this was a framing issue that we, originally, were very

uncomfortable about, trying to figure out what the heck this means for the Work Group, and it almost sounds like it would be better to treat it separately from the existing Class and make your determination and let the chips fall where they may.

I mean, it just sounds like it'd be cleaner than trying to go back in and revisit this because I just have a problem with the questions of indeterminate access and, you know, applying a 250-day to that, and I understand the counter-arguments.

DR. NETON: But that was part and parcel to the original discussion in this whole Class though. I mean, that was discussed. I mean, and the Class was voted in as it was based on that knowledge.

MR. FITZGERALD: Well, yes, and I think the original Class is fine except that it turns out that a key premise turned out not to be -- you know, it didn't hold as far as access and bioassay, but it affects a

relatively small, I don't know what the numbers are, but I would think a relatively small number of workers

DR. ULSH: What numbers are you asking about?

MR. FITZGERALD: -- on the cold side of R Building, number of workers that would be affected. I don't know. I don't have the number.

DR. ULSH: I don't know how I would sort them out from anyone in any of the other buildings.

MR. FITZGERALD: But I guess, why couldn't you --

MEMBER ZIEMER: I don't know of any that would --

MR. FITZGERALD: Why couldn't you deal with that as a separate -- I mean, you know, 83.14, I don't know how you would deal with it. I guess you would have to --

DR. NETON: Well, you could either get an 83.13 petition --

MS. LIN: Yes, I think because the agency's position is quite clear, and the Secretary signed off on it, and if SC&A and the Board Members are challenging the premise, and I think there is another way to --

DR. NETON: Yes, I think the clear thing, and in my opinion, the whole issue centered around, could radon have permeated from the SW Building into the R Building? If that were true, then I think we would be sitting here saying, we need to probably entertain an 83.14 because we've not covered everybody that was potentially exposed to radon.

But all I've heard today in this discussion is that we have. It was confined, essentially, to the SW Building, and so the Class, as it was added, was okay.

MR. FITZGERALD: So it really, and since you've taken that position, it would really fall to a petitioner, perhaps --

DR. NETON: Exactly.

MR. FITZGERALD: -- to actually take that position.

DR. NETON: Right.

MS. LIN: I would agree.

MR. FITZGERALD: That sounds like a much more straightforward way than this was originally crafted because it, you know --

CHAIR BEACH: Okay. So two separate issues here? Because I want to know the recommendation and the conclusion on those years I just described, what are we going to do with those?

MR. KATZ: The missing log book years. Are you talking about the missing log book years?

CHAIR BEACH: Because at one point last year when we discussed it, it was not going to be an 83.14.

DR. NETON: Well, no, I think if we can't find the log books and we can't document who left urine samples in those years, then that has to be an 83.14.

CHAIR BEACH: Okay. It just wasn't part of our discussion the last time when we discussed this paper.

DR. NETON: I don't recall, but I think it was always our intent that if the log book couldn't be found and we couldn't document -- Brant, am I missing something here?

DR. ULSH: No, you're not. You're great.

DR. NETON: I'm very certain that, at least internally, our position was going to be, if you can't find the log books, then you've got to add those years to the SEC.

CHAIR BEACH: Okay, because this is that expanded Definition to include all employment.

MR. KATZ: For those years.

CHAIR BEACH: So I just want to make sure I'm --

MS. LIN: Josie, even though we say expanded, it doesn't mean that we can just

go in and change the Class Definition. We need to do an 83.14.

CHAIR BEACH: Okay.

MS. LIN: It would require --

CHAIR BEACH: I understand, but I'm pretty sure I specifically asked if it was going to be an 83.14 and was told no. So this is just trying to make sure, because why we didn't settle this the last go around and why we brought it forward to today was because of that issue, I believe.

DR. NETON: And to expand it to all employees, I think that's true because you don't know who went in there then. So it would not just be people who worked in the R and SW -- or SW area, it's anybody who was on site because we don't know who went in there. You know, so that's the thing that we need to expand --

CHAIR BEACH: For those years.

DR. NETON: -- for those two years.

CHAIR BEACH: Okay. So has that been pursued? Is that moving forward to an 83.14 then?

DR. NETON: I'm not sure where it's at, to be honest with you, I mean, that's our intent.

DR. ULSH: I don't think we've initiated it yet. We're kind of waiting to see what you all do, but we can stop waiting and go ahead with that.

MEMBER CLAWSON: Why would you wait? You know, Jenny said this has already been done. You know, part of the problem is that if you take a look at this, what spurred all of this was clear back very beginning that there was a clear line back there.

Nobody could cross it. You couldn't do all these things. So this is really what's got us into the ventilation system. I was kind of taken by surprise by this because, I'll be honest, I thought they were just adding on to this system with these

years.

But I do want to make one thing clear, you were talking about this wonderful ventilation system.

DR. ULSH: I don't think I used the word wonderful.

MEMBER CLAWSON: Okay. What did you call it? Robust?

DR. ULSH: No, I don't think I used that one either.

MEMBER CLAWSON: You're talking about a negative system. I have a facility right now that, within ten minutes, if we don't have ventilation, we're on alarm because of the radon in our facility.

The point that I'm trying to bring up is if this ventilation system was built years ago, they actually took the ventilation system and made this into a negative system. They negative pressures that you're talking about here are minimal.

They are very, very small. My

alarm is at 1. You know, it's hard to really stay up on this, the whole part of what got us to this point, especially with the ventilation and everything else like that, but it's when we made a comment that nobody could come into this area without leaving a tritium bioassay.

And that, in my opinion, was not correct. They could come through there, and we see this all the time. People that work continuously and so forth like that, it could be, but, you know what, people still come in there, and if you're not assigned to that building, but you're working in there, you could still not have to leave one.

DR. ULSH: All that's required to be in this Class is one single tritium urinalysis and 250 days, really, of exposure.

MEMBER CLAWSON: Exposure or work --

DR. NETON: No, just of employment.

(Simultaneous speaking.)

DR. ULSH: That's right.

MEMBER CLAWSON: This is something I wanted to clear up because I was --

DR. NETON: No, it's just, you know, one sample and 250 days of employment.

DR. ULSH: That's right. You're absolutely right.

DR. NETON: During the covered -- during the SEC period.

DR. ULSH: We have known since we conducted the interview, at least since we conducted the interview at the federal building in Cincinnati, the story we got at that time is the story that we're hearing today.

If you wanted to pop in and deliver a letter, you might do that without a tritium urinalysis. If you wanted to, well, now, I guess another scenario is, on your break, go meet with your friend, you could do that. That has not changed.

Yes, we all know, we've all talked

about the mistake that was made in terms of, could you be somewhere in the R Building without tritium urinalysis? We know that that was not correct.

My point is it's irrelevant because you didn't have exposure potential when you were in those areas and you can't go in for 250 days and get exposed to radon, and not leave a single tritium urinalysis. It's simply not plausible.

No one has shown me an example of someone who did it. We're speculating here, and I've got 13 workers that say it's really not plausible. Even the guy that you talked to on Thursday didn't say that --

MEMBER CLAWSON: I'll tell you what, Brant, if I can get 15 people to say that they could, can we just play the game that way?

MS. LIN: Brad, I don't think the issue here is that. You know, I think it seems like the Work Group has a path forward,

which is to find a claimant who fall outside of that Class but should be included in an SEC Class from Mound.

And so I think an 83.13 would be a very clean --

CHAIR BEACH: 83.14, oh, got you.

MEMBER ZIEMER: 13, yes.

MS. LIN: -- would be a clean solution. So I think we can go forward on that.

CHAIR BEACH: Okay. How are we doing? All right. So action items. The only one I can see out of the radon issue at this point is an 83.14 for those two periods in '72 and '75 for this issue.

MEMBER ZIEMER: Are those the log book periods?

CHAIR BEACH: Yes. And, Paul, if you need the dates, they're right here.

MEMBER ZIEMER: I got it.

CHAIR BEACH: So I guess, you know my normal question is, how soon are we going

to have an answer for that?

DR. NETON: Well, it may take a while to find the litmus case. I mean, to do an 83.14 we can't just do it ourselves. We have to find the claimant who is in that period with a covered cancer, well, covered cancer is better to do it with, and then move forward.

And so I'll communicate this when I get back and we'll start the process. As soon as we get a litmus case, we'll write up the 83.14 and move it forward.

CHAIR BEACH: Okay.

MR. KATZ: It shouldn't be that hard to do because you have lots of people, even if they've already been covered by the Class, you have lots of people that fit this.

DR. NETON: I'm trying to think. Originally I thought it might be difficult, but you're right, I don't see why. It should be anyone who worked in those years at Mound that has a covered cancer --

MR. KATZ: Right.

DR. NETON: -- is eligible.

CHAIR BEACH: So then we'll just hear from you at the next gathering of the Work Group just to see how we're --

DR. NETON: Yes.

CHAIR BEACH: Okay.

MR. FITZGERALD: I guess the only other thing is, is there a mechanism, like the Ombudsman, just to let, I guess, some of the claimants who expressed some concern about being left out that, you know, this will be the recourse? I mean, they're sort of in the dark right now.

CHAIR BEACH: That's a good point because I think that's where some workers came to my attention was through the Ombudsman, I believe.

DR. NETON: I'm not sure.

MS. LIN: So it seems like you guys already know some people, do you?

MR. FITZGERALD: Well, it seems a

little fuzzy about how you actually would just make sure they are aware of what happened in terms of these proceedings.

MEMBER ZIEMER: Wouldn't they have made a claim?

MS. LIN: Yes.

CHAIR BEACH: There was an issue that -- this issue has been going back and forth for several years, and I'm sure, Jim, you're way more up on it than I am because, well, at least for the last year before it came back and this paper was written, it was because of those missing log books, and I believe that was because claimants came forward that weren't covered, but I don't know the details and the history.

DR. ULSH: Not exactly. It's even more complicated than Jim described before. We've got another issue that we haven't even talked about. The first issue was the log books and the gaps in the log book records. That's one issue.

The second issue is the one that we've been hashing about here for the past hour. The third issue was the interpretation of the MESH dosimetry report.

CHAIR BEACH: Oh, yes. That was the --

DR. ULSH: And that was the iron workers, I think, Josie, if my recollection is correct.

CHAIR BEACH: I think you're absolutely right. I believe you're right.

DR. NETON: Yes, good point, Brant. I forgot about that part.

DR. ULSH: Yes. And so since I was writing our October 2011 report anyway, I took that opportunity to explain the interpretation of the MESH dosimetry report. Some people were interpreting some zero entries in a particular column to mean that they were tritium bioassayed, and, in fact --

DR. NETON: These were annual employee exposure summaries that were mailed

to workers.

DR. ULSH: Yes.

DR. NETON: And they would say, tritium zero, and what that meant was, your external dose from tritium was zero and then you had no -- well, it could mean either.

DR. ULSH: I'm going to stick with the explanation that's in the paper because I'll probably mangle it, but it's indeterminate. That particular report is indeterminate about whether or not you were tritium bioassayed.

CHAIR BEACH: And I did see that report. Yes. It's very clear.

DR. NETON: And that's a good point. I had forgotten about that.

DR. ULSH: So, like I said, since I was writing that October paper anyway, I took the opportunity to address a number of issues that had popped up since the Class Definition at the Niagara meeting. I put it all into that one report.

CHAIR BEACH: Yes, which you did that. So the log book issue is being covered under an 83.14. The MESH has been -- it's an interpretation issue?

DR. NETON: We've communicated that to the Department of Labor a number of times. They're aware of how to interpret it and they've communicated that back to claimants who proffer that as evidence that they were exposed to tritium.

CHAIR BEACH: Okay. And then the access issue would be another petition, an 83.13.

DR. NETON: Right.

CHAIR BEACH: Okay. So any other issues for radon? Okay.

MR. FITZGERALD: Did Joe Provecchio ever get on?

MR. STIVER: Yes, actually he did email me. He's on, but we kind of passed --

MR. FITZGERALD: Oh, okay.

(Simultaneous speaking.)

CHAIR BEACH: Okay. So right now, let me go over the action items, and then we'll give anybody on the phone a chance to speak if they'd like to. So action items under tritides for NIOSH to provide the SRDB number for the interview notes for the thorium, or I'm sorry, for the tritium.

SC&A review NIOSH's White Paper and then, of course, we're still going to ponder the policy question.

Under the internal, we asked NIOSH to make available the raw data and support data. Review comments on the open items from the January 12th SC&A's paper. There's three or four items there. And then report on the polonium issue.

And then radon is just the 83.14. Did anybody have anything else besides that?

MR. FITZGERALD: Just the Ombudsman thing or is that a 13 issue?

CHAIR BEACH: That's 83.13, yes.

MR. FITZGERALD: So the mechanism

for just letting everybody --

DR. NETON: Yes. That's a good question. I'd like to think about how we do that. An 83.13 goes out and we don't have a good mechanism for -- if it gets awarded, the Department of Labor typically goes to the location and does a worker outreach visit to communicate the Class and who's eligible and that sort of thing. We typically go to those meetings to answer questions about it.

CHAIR BEACH: Right.

DR. NETON: So that's one thing they do. And there would be a public notice of that meeting and all that sort of stuff.

CHAIR BEACH: Okay. So that's one we'll put on your shoulders again for that.

DR. NETON: That's if an 83.13 actually gets awarded.

CHAIR BEACH: Right.

DR. NETON: But to recruit --

MR. KATZ: You can't recruit an 83.13.

CHAIR BEACH: No, you cannot.

MR. KATZ: The agency can't recruit an 83.13. I mean, I would do an 83.14 if it had the basis for one.

DR. NETON: Right, exactly. I mean, if we receive any 83.13s, of course, we process it exactly like you would any other petition.

CHAIR BEACH: Okay.

MR. FITZGERALD: I think it's just more of a communications thing. Just, you know, this is what happened at the Work Group just so you're aware of --

DR. NETON: Yes, and that will certainly come out at the Board meeting. I mean, we discussed it.

MR. FITZGERALD: True.

CHAIR BEACH: Okay. Yes, I didn't suggest anything more than what Joe was talking about is letting an Ombudsman know so that the word can get put out.

DR. NETON: Yes, we certainly will

communicate this to the Department of Labor in our biweekly phone calls, and we can ask that they let the Ombudsman, DOE Ombudsman know.

CHAIR BEACH: Okay.

MR. KATZ: The DOL Ombudsman?

DR. NETON: What?

MR. KATZ: The DOL Ombudsman?

DR. NETON: The DOL Ombudsman, I'm sorry.

CHAIR BEACH: Okay. And then are there any petitioners, or anyone on the phone, that would, workers, public, like to comment or have questions?

DR. NETON: Anybody on the line?

MEMBER CLAWSON: Phil, are you on the line?

MR. PROVECCHIO: Yes, Joe Provecchio is on the line.

MEMBER CLAWSON: Okay.

CHAIR BEACH: Joe, we're just about to start.

DR. ULSH: I'm not going back and

repeating everything.

CHAIR BEACH: So I guess if there's no one on the line then we should probably look at scheduling for the next Work Group meeting. Ted, I guess that's on you if you --

MR. KATZ: Sure. Well, we need a sense of how much time people need and then we'll send out -- we don't need to do it here and now, although we could do it here and now actually.

CHAIR BEACH: Yes. It would be nice, since everything's filling up, if we could.

MR. KATZ: Yes. So first, people need to have a sense --

MS. LIN: Well, my family is coming to visit on May 15th through 18th so I would appreciate we schedule something in that time period.

CHAIR BEACH: It might be a little early, Jen, sorry.

MR. KATZ: That's on the record now.

MS. LIN: Oh, crap.

DR. NETON: I'm going to copy it and send it to your family.

MS. LIN: Thanks.

DR. NETON: I will be away during that entire week.

MR. KATZ: So we're looking at late May, early June?

CHAIR BEACH: Yes. And I'm wondering if we shouldn't just shoot for the first week of June; Tuesday, Wednesday, Thursday.

MR. KATZ: Well, let me see what's available.

DR. NETON: Usually the week before a Board meeting is fairly open until Work Groups get scheduled.

MR. KATZ: I have to see what I have on the books.

CHAIR BEACH: Well, that gives us

another additional week if we go in that first week before the Board meeting. So I think the first week of June is probably the latest we should try to schedule it.

MEMBER ZIEMER: Well, I can do the first week in June; 5th, 6th, 7th, or 8th, would be best.

DR. ULSH: I'm going to be on vacation in the beginning of June, but I don't know if it's the first week. I mean, I guess you really can't go without me, can you?

DR. NETON: No. You won't get off that easy.

MR. STIVER: You can call in, right?

DR. ULSH: Right.

MR. KATZ: I'm sorry, Brant, did you say you're on vacation when?

DR. ULSH: I know the 12th, 13th, that week, but I don't know if we're leaving on the 5th or not. I think we are.

CHAIR BEACH: So you're leaving on

the 5th?

DR. ULSH: Well, I think we're -- why don't we go ahead and, if you want to schedule in the first week of June, and I'll just let you know if I have a conflict and we'll have to reschedule it.

MR. FITZGERALD: You're saying the latter part of May is out? You're out?

CHAIR BEACH: I'm scheduled up.

MEMBER ZIEMER: I'm out, too.

CHAIR BEACH: Yes. And, Paul, you're out the last week in May?

MEMBER ZIEMER: Yes. Well, I could call in, but I wouldn't be able to be here.

MR. KATZ: What's wrong with June 4th, for example?

CHAIR BEACH: Well, just traveling on a Sunday, and I'm going to be out of town. So that's why I said the 5th.

MR. KATZ: Or June 5th.

CHAIR BEACH: The fifth is fine.

(Simultaneous speaking.)

MEMBER CLAWSON: How about the 6th?

MR. KATZ: Well, I'm already messed up because my son's birthday is on the 7th, and I already booked a DR Subcommittee for the 7th, so I'm not going to be gone on the 6th.

MEMBER CLAWSON: You're already in trouble.

MR. KATZ: Because I'm already missing most of his birthday.

MEMBER CLAWSON: Well, yes, I thought that's when we bid for the --

MR. KATZ: We did, and I had his birthday wrong.

CHAIR BEACH: So does the 5th work for you?

MR. KATZ: So the 5th works for me.

CHAIR BEACH: So we can shoot for the 5th as a first choice and the 4th if --

and I'll travel on Sunday if I have to.

MR. KATZ: Wait, so does the 5th not work for anyone?

MR. FITZGERALD: Well, Brant was thinking maybe --

MR. STIVER: Brant may be going on vacation at that point.

DR. ULSH: I'll let you know.

MR. KATZ: Oh.

DR. ULSH: Tickets were already bought.

MR. KATZ: Phil, are you still on the line?

MR. PROVECCHIO: Yes, sir.

MR. KATZ: So, Phil, does -- that didn't sound like Phil.

DR. NETON: That's Joe.

MR. FITZGERALD: That's Joe Provecchio.

MR. KATZ: Phil? Phil Schofield, are you still on the line?

CHAIR BEACH: Should we go offline

and try to finish this up?

MR. KATZ: So anyway, let's try for the 5th, everybody pencil that in, I'll send it around, and if we get some nays, we'll rethink, but June 5th?

DR. NETON: All right.

CHAIR BEACH: Thank you, everyone. Good meeting.

(Whereupon, the above-entitled matter was concluded at 2:43 p.m.)