CENTERS FOR DISEASE CONTROL AND PREVENTION

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

ADVISORY BOARD ON RADIATION AND WORKER HEALTH

TELECONFERENCE OF METALS & CONTROLS CORP.

WORK GROUP MEETING

WEDNESDAY, DECEMBER 6, 2023

The meeting convened at 11:00 EST,

Josie Beach, Chair, presiding.

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Members Present:

Josie Beach, Chair

Henry Anderson, Member

David Kotelchuck, Member

Nicole Martinez, Member

Loretta Valerio, Member

Registered and/or Public Comment Participants:

Rashaun Roberts, Designated Federal Official

Nancy Adams, NIOSH contractor

Nick Bailey, DSCA/ORAUT

Bob Barton, SC&A

Zaida Burgos

Grady Calhoun, DCAS

Madeline Cook, SC&A

John Elliott, Claimant representative

Michael Elliott, Claimant representative

Joseph Fitzgerald, SC&A

Rose Gogliotti, SC&A

John Hawkinson

Amy Mangel, SC&A

Susan McCall, DCAS contractor

Pat McCloskey, ORAUT

Chuck Nelson, DCAS

Michael Rafke, HHS

LaVon Rutherford, DCAS

Members Present continued:

Mutty Sharfi, ORAUT

Matthew Smith

Tim Taulbee, DCAS

Brant Ulsh, DCAS/ORAUT

Paul Ziemer, ABRWH Member

TABLE OF CONTENTS

Advisory Board on Radiation and Worker Health Teleconference of Metals & Controls Corp. Work Group Meeting 1

Proceedings 5

Welcome and Roll Call 5

NIOSH Response to SC&A's April 2023 Review of NIOSH's January 2023 Response to SC&A's August 2022 Supplemental Review of M&C Work Group Issues 10

SC&A's Review of Overall NIOSH Response and SEC Issues Under Consideration 78

Petitioner Comments 127

Work Group Discussion 139

Work Group Discussion of Path Forward 149

PROCEEDINGS

(11:00 A.M.)

WELCOME AND ROLL CALL

DR. ROBERTS: All right. I have 11 o'clock Eastern, so I'm gonna go ahead and open up the meeting. So, good morning, everyone. I'm Rashaun Roberts. I'm the designated federal official for the Advisory Board on Radiation and Worker Health, and this, of course, is a meeting of the Metals and Controls work group. So, just want to welcome everybody.

All of the materials for today's meeting are posted on the NIOSH website for this program under scheduled public meetings. If you go to calendar year 2023 and check -- click on the tab for December, you can find them. If you are participating by telephone only, you can go to the website to access all of the materials, which will allow you to follow along with the presentations. The materials were provided to work group members and to staff prior to this meeting.

As you know, the meeting is being conducted by telephone and Zoom. On the website, there is a Zoom link which will enable you to hear and watch the presentations through Zoom. If you've chosen to receive audio through Zoom, you should be able to speak to the group and hear the presentations on that platform. If you're not speaking, please be sure to stay on mute by muting the microphone. Typically, that's on the lower left-hand corner of your screen. If you've dialed in, you will only be able to speak and hear the presentations through the telephone line, so please make sure your phone stays muted unless of course you need to speak. If you don't have a mute

button, press star six to mute. If you need to take yourself off, press star six again. Also, if you're only participating by telephone, we're unable to see your name, so please identify your herself before providing comments or questions.

So first off, let's address conflict of interest. And I'll speak to that with respect to the members of the board who sit on this work group who have all been determined not to have any conflicts of interest, so they don't need to address this in the roll call. So, with that, let me move into roll call for the members of the Board who are in the work group, starting with our chair in alphabetical order.

So, Beach?

CHAIR BEACH: I'm here. Good morning.

DR. ROBERTS: Morning. Anderson?

MEMBER ANDERSON: I'm here.

DR. ROBERTS: Kotelchuck?

MEMBER KOTELCHUCK: Here.

DR. ROBERTS: Martinez?

MEMBER MARTINEZ: I'm here.

DR. ROBERTS: Valerio? Loretta, are you on? If so, we can't -- we can hear. (Indiscernible) --

CHAIR BEACH: She was -- she was having trouble with her computer this morning.

DR. ROBERTS: Okay. I'll come back around the end. So, as I move on to roll call for others, as you register your attendance, please be sure to acknowledge or make known any conflicts that you might have that are

relevant to the working group and, of course, recuse yourself from the discussion accordingly. So, let's start with the NIOSH/ORAUT/DCAS --

MR. CALHOUN: Yeah, this -- this is Grady. No conflicts at metal -- Metals and Controls.

DR. TAULBEE: This is Tim Taulbee. No conflicts at Metals and Controls, but I do have a conflict at Mound.

MR. RUTHERFORD: This is Lavon Rutherford. No conflicts at Metals and Controls.

DR. NELSON: This is Chuck Nelson. No conflicts at Metals and Controls.

DR. ULSH: Brant Ulsh. No conflict at Metals and Controls.

MR. BAILEY: This is Nick Bailey. No conflicts and Metals and Controls, but I do have a conflict with Mound.

DR. ROBERTS: Okay. Any --

MR. SHARFI: Mutty Sharfi. No conflict with Metals and Controls, but I do have a conflict at Mound.

MR. MCCLOSKEY: This is Pat McCloskey, Oak Ridge Associated Universities. No conflicts.

DR. ROBERTS: Anyone else with DCAS/ORAUT? Okay. Let's move on to SC&A.

MR. BARTON: Bob Barton, SC&A no conflicts.

MR. FITZGERALD: Joe Fitzgerald, SC&A. No conflicts with Metals and Control (sic).

MS. GOGLIOTTI: Rose Gogliotti, SC&A, no conflicts.

DR. ROBERTS: Anyone else with SC&A? Let's move on to HHS and

contractors.

MR. RAFKEY: Michael Rafkey, HHS. No conflicts.

MS. ADAMS: Nancy Adams, NIOSH contractor. No conflict.

DR. ROBERTS: Anyone else with HHS, other contractors?

MS. MCCALL: Susan McCall, DCAS contractor. No conflicts.

DR. ROBERTS: Okay. Moving on to the departments. Anyone with DOL, DOE, other departments? Okay. And finally, are there any members of the public who would like to register their attendance?

MR. MIKE ELLIOTT: Yes. Good morning. This is Mike Elliott. I'm Petitioner for SEC petition 236 M&C.

DR. ROBERTS: Thank you. Any other members of the public? Hearing none, --

MR. MIKE ELLIOTT: I think -- I'm sorry, Ms. Roberts. I just want to mention that my colleague, copetitioner John Elliott, is on the call via phone. He's on the phone number that starts with 1401 and ends in 886, so there's two petitioners on the call.

DR. ROBERTS: Okay. Thank you.

Okay. Well, thank you and welcome again to all of you. Before we officially move into the meeting, just a reminder throughout the meeting, please keep your phone on mute unless, of course, you're speaking. If you don't have a mute button on your telephone, press star sick -- six. If you need to take yourself off, press star six again. For those on Zoom, the mute button is often located on the lower left-hand side of your screen, so please periodically check that to make sure you're on mute if you're not speaking or presenting. And also, for those on the phone, please periodically check that

you're on mute.

So, with that, let's go ahead and get started. And I'll turn the meeting over to the chair of the working group, Josie Beach. Josie.

CHAIR BEACH: All right, good morning. Thank you. Loretta is on. I double-checked with her via phone. And everybody should have the agenda. We -- we are going to go --

DR. ROBERTS: I'm sorry, Josie. I forgot to go back to Loretta. Can -- Loretta, can you give a verbal indication that you're there?

MEMBER VALERIO: Can you hear me now?

DR. ROBERTS: Yes. Perfect. Thank you. Thanks, Josie.

CHAIR BEACH: Sure, no problem.

So, we do have a lengthy agenda. A couple of lengthy slide presentations starting with NIOSH. We will take a comfort break sometime in the middle just determining where we are in the slides.

And Brant, as you tee up your slides to get us started this morning, I have a quick question for you. Do you mind if we ask questions as you go through your presentation to keep it coherent? Since there's 38 slides, we just got them late yesterday, it might be easier if we could just ask the questions as we go. Do you have a problem with that?

DR. ULSH: None at all.

CHAIR BEACH: Perfect. I -- we've done this before, and by the time you get to the end, it gets really hard to go back to the beginning. So, okay. So, if -- yeah, after -- after each slide, if you don't mind if we just briefly see if there's anybody that has questions, that would be wonderful.

DR. ULSH: Okay.

CHAIR BEACH: Thanks.

DR. ULSH: Are you ready for me to proceed, Josie?

CHAIR BEACH: Yes, go ahead.

DR. ULSH: Okay.

CHAIR BEACH: I'm done.

NIOSH RESPONSE TO SC&A'S APRIL 2023 REVIEW OF NIOSH'S JANUARY 2023 RESPONSE TO SC&A'S AUGUST 2022 SUPPLEMENTAL REVIEW OF M&C WORK GROUP ISSUES

DR. ULSH: Well, I will -- I will leave my camera on only long enough to show you my Christmas tree tie to demonstrate that I am in the spirit, so --

CHAIR BEACH: Good. We all are, hopefully.

DR. ULSH: Happy holidays to everybody. Now let's see if I can successfully share my screen. Share. All right.

Rashaun, does it look like it's supposed to?

DR. ROBERTS: Yes, it does.

DR. ULSH: Excellent. All right. So, I -- I'm leading off the action this morning with a discussion from the NIOSH standpoint of the remaining issues in the Metals and Controls SEC discussion. Let me see. There we go. Here is kind of the agenda for what I'm going to cover this morning.

With regard to the specific issues, I assembled this list of issues and the order in which they appear directly from SC&A's latest response document that they put out last month. So, I just went to the executive summary and pulled out that list so you can -- so it follows some kind of

logical order. Here is the remainder of the specific issues that I will con -- that I will cover this morning, and then our conclusions.

All right. So, first the intro. And this is just a recap of the events that have occurred since the last working group meeting back in July of this year. Work group chairman Josie Beach presented her update to the Advisory Board at their August meeting. After that, NIOSH issued our latest response paper that also occurred in late August, and then SC&A recently issued their latest response. So, this -- these last two bullets here are kind of the latest string of -- of back-and-forth responses that have occurred for some time now.

So, what has changed? A lot of my present -- presentation is going to sound very familiar to the presentation that I gave in July because not much has changed, and our positions then are very similar, if not identical, to our positions now. Because in the responses, it feels to me like we have gotten to the point where both SC&A and NIOSH are simply restating their arguments. There's not any new evidence that I can see on any of these issues, but we will walk through them.

So, the first issue is coagulant. That is a term that both NIOSH and SC&A have used to refer to the green lube. And I have to retreat a little bit on this term because in the latest response paper from SC&A, they have taken the definition of the term coagulant and applied it in a way that we certainly never intended to agree to. Green lube is the term that a -- an interviewee used. I don't know where the coagulant first originated, whether it was an interviewee who used it or maybe NIOSH or maybe SC&A; I don't know. I couldn't find the first use.

But in the latest response paper from SC&A, they sort of conflated this green lube, which is industrial lubricant that went down the waste line drains and caused clogs. And the leap that we don't follow them on is conflating that with water treatment plant chemicals, coagulants, that are used in that setting. We certainly never intended to agree to that kind of a -- of a jump.

And this kind of explain this -- it finally occurred to me why SC&A is saying that this is a mechanism for concentration. Because it was just never obvious to me. I couldn't quite follow the logic, but now I understand how they got there.

So, first of all, coagulants in a water treatment plant are used to pull contaminants out of -- pull suspended Solomon -- suspended solids out of a water column, a wastewater column, but this is a residual period. The uranium and thorium that exists in the system during the residual period is largely adhered to the surfaces of pipes, either as surface contamination or scale or its contamination in soil around the pipes. It's not waterborne, and so it's not subject to coagulation. And that was the disconnect that I just couldn't quite follow.

And so, given that, how does -- the uranium and thorium that is adhered to pipe source or is in soil, how does that become waterborne and subject to coagulation? I couldn't follow that, because no evidence has been presented that this green lube displaces -- that it's corrosive or abrasive enough to pull the uranium and thorium off the surfaces of the pipes. In fact, that -- those would be undesirable qualities in an industrial lubricant. Lubricants typically are anti-corrosive. And for example, that's why I put vegetable oil on my cast iron pans, to prevent rusting and corrosion.

So, it's not obvious -- there's no evidence that's been presented that this green lube is capable of -- of making the uranium and thorium available for coagulation. That's the first disconnect, I think.

CHAIR BEACH: Okay. Before you go on, Brant, I do have a question on that slide.

DR. ULSH: Let me see if I --

CHAIR BEACH: Actually, a couple of them.

DR. ULSH: Let me see if I can go back. There we go. Okay.

CHAIR BEACH: So, on the first bullet, wasn't SC&A just explaining the coagulant mechanism and how it works? And the water treatment was just an example, and I think that was used because of -- I think NIOSH called it a sticky goop. So, I believe they were just explaining the coagulants.

DR. ULSH: Could be, but it's not obvious. I mean, I'll let SC&A explain their position. They're the next presenter.

CHAIR BEACH: Okay.

DR. ULSH: But the way that I interpreted it was, that was kind of the train that led to this -- this green lube serving as a concentration mechanism because --

CHAIR BEACH: Okay. Go ahead.

DR. ULSH: Well, in the water treatment plant, the -- a coagulant pulls the suspended solids out of the water column and into a sediment, and there -- and that is a concentration mechanism.

CHAIR BEACH: Okay. And to coagulants -- back to your original comment -- were first brought up during interviews, so that's where that started back in 2017.

And then my second question is on your second bullet, I'm confused by your second bullet, actually. Are you saying there would not have been any uranium in the waterborne second -- sediments in the drainpipes in the 1980s? And how would you know that? Isn't that uncertain?

DR. ULSH: No, what I'm saying is -- I'm contrasting this with an active operations period, where, you know, you have operations with uranium and thorium that are being washed down the drain in wastewater, that -- you know, the uranium and thorium there is -- is not continuously, but episodically being introduced into the drain line as a waterborne contaminant. At the end of operations, the uranium, and thorium that remains that has not been flushed from the system in wastewater is adhered to the pipes or it's in the soil column. So, that's the remaining containment -- contaminants that we're worried about.

Now, the idea would be that a fraction of that, very small fraction, might, you know, slowly over time be introduced into the water column, but certainly not the entire source term.

CHAIR BEACH: I think it was an -- it was a -- the introduction -- introduction of the coagulants over time during that 27-year period and during the time when the uranium and thorium were going through the system, it acted to clog up those drainpipes, which could have brought the source of the uranium and thorium in that pipe to be more -- more available or more -- or trapped in the pipe, so that when the maintenance workers went back in and tore out the pipes, whether they use to saw or a snake, that's when they were exposed or potentially exposed to the uranium and thorium. So, that was my understanding of that.

DR. ULSH: Well, I think you've hit the nail right on the head jersey that that is the point that we dispute. You said that the coagulant makes uranium and thorium more available, and we do not agree with that. There has been no evidence presented that the green lube or coagulant, if you want to use that term, makes the uranium and thorium more available.

CHAIR BEACH: Well, it just entraps it into the system, into the piping, which would make it more available when the maintenance workers went in to clean out those pipes.

DR. ULSH: It's a residual period. It was there at the beginning of the residual period.

CHAIR BEACH: Correct.

DR. ULSH: If not -- if not, it got flushed through the system, and it's gone. So, it was --

CHAIR BEACH: Unless it was clogged up. Okay. So, we -- we can move on. I mean, --

DR. ULSH: Well, I say --

CHAIR BEACH: There's no evidence.

DR. ULSH: Go ahead.

CHAIR BEACH: There's no evidence that there wasn't clogged drains with uranium and thorium. That's the point.

DR. ULSH: And I'm not claiming that -- that there were -- I'm not claiming that. What I'm claiming is that the uranium that the workers were exposed to when they dealt with these clogged drains was adhered to the surfaces of the pipes or it was in the contaminated soil, largely. I do -- I think I see that a couple of people have their hands up, Henry and David.

MEMBER KOTELCHUCK: Yes.

DR. ULSH: Okay.

MEMBER KOTELCHUCK: (Indiscernible) --

MEMBER ANDERSON: Yeah, go ahead, Dave.

MEMBER KOTELCHUCK: Can I --

MEMBER ANDERSON: Yeah.

MEMBER KOTELCHUCK: I just wanted to say -- Dave Kotelchuck -- what we're talking about, Brant, is I find here, and we will see this again and again in your presentation, no evidence has been presented that. One of the serious problems in this whole assessment that we're doing on Metals and Controls is that we're trying to find is -- is the -- is the ground that the -- ground that people are working in, is -- is that ground sufficient to characterize the radiation.

And what we're saying is we have an affirmative -- we have an affirmative sense that we have to identify the radioactive source. And to say no evidence is presented when -- is -- it's --it's our affirmative need if we wish to deny this petition to -- to -- to present evidence to show that -- that the uranium and thorium, in fact, is not when -- it's our need to say it's not waterborne and not subject to coagulation. But the -- the -- we have to prove that or we can't say no evidence has been presented. The whole central issue here is that there is a lack of evidence, in my opinion, a profound lack of evidence that goes beyond the -- the dirt and the mud, in the subs -- in the sub -- sub -- subsurface area.

DR. ULSH: So, before I move on to Henry, I would like to respond to that. I think --

MEMBER KOTELCHUCK: Sure.

DR. ULSH: I think, similar to Josie earlier hitting the nail on the head in terms of getting right at the nugget of the disagree -- remaining disagreements, I think you've done the same here. And that --

MEMBER KOTELCHUCK: Yes.

DR. ULSH: -- is that we assert, and I get, you'll have plenty of opportunity to -- to take me to task on this in the coming slides -- we have presented evidence that we asset is compelling. It is survey data, it is soil data, it is surface contamination pipe data, it is scale data. We have presented evidence to back up our position. When SC&A makes an assertion, like they have made where the green lube can somehow concentrate this, you know, uranium and thorium, there needs to be some evidence to back that up. Otherwise, we're being put in a position where we have to prove a negative. And as you know, I'm sure you know, it is simply not -- regardless of what the truth is, it is simply not possible to shoot down every scenario that could be dreamed up and presented without evidence. And we assert that there is some burden of presenting some evidence to show that these are plausible scenarios. I mean, there's no end to it otherwise. So, that is our position. I understand --

MEMBER KOTELCHUCK: Okay.

DR. ULSH: -- that some may not agree with it, but that's our position.

MEMBER KOTELCHUCK: Okay.

CHAIR BEACH: So, before we run to Andy, I just want to say that the uncertainty remains here, Brant. And the burden is not on the work group, the burden is on NIOSH, and -- and your arguments haven't convinced the

work group at this time.

DR. ULSH: Well, so again, I would say we are presenting our recommendation. You all can judge what the evidence that we presented to support our -- our recommendation and make your own recommendation. That's your part in this process. And I'll leave that to you to decide how you judge that, but --

CHAIR BEACH: Okay. Thank you.

DR. ULSH: -- but I -- you know, I -- yes, NIOSH has a burden -- has a burden of proof to support their positions, and I assert that we have done that. But all of these scenarios that have been presented, these six scenarios that NIOSH has considered -- and this is getting a little ahead of my slide show -- it seems to me that there should be some evidence to show that it is plausible, otherwise, there's just no end. And we can't possibly address every possible speculative scenario that is presented without evidence. We just -- it's not possible to do that.

CHAIR BEACH: Okay. So, I'll -- I'll agree to disagree, and we'll move forward. And I cannot see the hands raising. So, if you can see him or somebody, please --

DR. ULSH: Yes, I'm -- Henry had his hand up earlier, --

CHAIR BEACH: Yes.

DR. ULSH: -- but I don't see it there now.

MEMBER ANDERSON: Yeah, I -- I still had my hand up. I -- I just wanted to say I thought the pipe scale would be -- I mean, when you say scale, it can come off the inside of the pipe gradually over time. The other time -- other thing is, whenever you put a -- a -- you know, a wire through

to open up and try to get rid of a clog, it's going to scrape the sides of the pipe on the inside and would get scale off as well. And again, if -- I thought the -- when you're talking about concentrating in the green lube hardly, it's that the green lube captures any scale or particulates that may come off and then the -- lead to further blocking up the (indiscernible) over time.

DR. ULSH: I am --

MEMBER ANDERSON: So, doesn't the scale come off over time?

DR. ULSH: I am going to go into that in a little more detail in two slides, I think.

MEMBER ANDERSON: Okay.

DR. ULSH: I see --

MEMBER ANDERSON: -- it's an ongoing -- ongoing activity of scale coming off. And if the scale was still present inside the pipe, or some of it 27 years afterwards, it's been there, prior to that, certainly it would have been more.

DR. ULSH: Okay. I see that Nicole has her hand up.

MEMBER MARTINEZ: Hey, yeah, thank you. I'm gonna go ahead and lower my hand before I forget. So, I just -- a couple of things. Before I engage in this debate, I just wanted to say that I still have an open mind. I'm -- I'm happy to hear what Brant and NIOSH has to say, and I'm happy to hear what SC&A has to say, and then maybe kind of circle back to this question. And I think I know the answer to this, Brant, but just to be sure, so, green lube and coagulant are kind of terms that have been used lightly interchangeably. And so, we don't know -- like, green lube is something someone said and we don't know what that -- like, we don't know the

chemical constituents of that or the brand or anything like that?

DR. ULSH: That is correct.

MEMBER MARTINEZ: Okay. Yeah. It's a fun -- for me, this is a fun chemistry question, so I was curious about that. But presumably a lubricant and a coagulant are but very different things.

DR. ULSH: That's the point that I'm trying to make.

MEMBER MARTINEZ: Okay. Okay. Thank you.

DR. ULSH: Yeah, the -- the substance that we're talking about was used as a lubricant for the wire drawing machine, and it inadvertently got flushed down the drain -- the drainpipes that we're talking about and was present in the clogs that the workers had to try to remove.

MEMBER MARTINEZ: Interesting. Okay. Thank you.

DR. ULSH: Sure. I don't see any other hands up. Is it okay for me to move on to the next slide?

CHAIR BEACH: Yeah, go ahead, Brant. Thanks.

DR. ULSH: Okay. Let me see. All right. So, the point that I was originally making here is that just because a material goes down a drain and clogs it up, that doesn't make it functionally similar to coagulants that are used in the setting of a water treatment plant. A lot of materials clogged drains. Some examples are bacon grease, coffee grounds, vegetable oil, even too much toilet paper will clog a drain as we all know. And some -- furthermore, some of those -- all of those except bacon grease are plant based, but that does not make them functionally similar to a coagulant in a water treatment plant such that they can cause concentration of contaminants.

CHAIR BEACH: So, stop you here for a sec. On your second bullet, I believe it was worker number seven that brought up the lube that you brought out in your paper. This was actually described by workers interviewed in 2017. And a couple of them described it as a coagulant oil that clogged up the pipes, isn't that right? And either way, evidence is that coagulant oils did go into the drains and did clog the drains.

DR. ULSH: I -- well, first of all, like I said, I don't know. It could be that those workers introduced the term coagulant. Like I said, I don't know where it originally came from. Could have even originally came from us. And I don't dispute that coagulant oils went down the drain and clog -- caused clogs. I don't dispute that at all. What I dispute is that it served as a mechanism to concentrate uranium and thorium.

CHAIR BEACH: Okay. And I don't believe we said it concentrated. It actually caused it to get stuck in the pipes.

DR. ULSH: SC&A absolutely said that it could serve as a concentration mechanism. I don't believe the working group has weighed in on this. We're still in the middle of a -- of deliberations on it, but that was absolutely in SC&A's report. Otherwise, why are we even talking about it? I mean, if it's not -- if it's not a concentration mechanism, it's -- it's not an issue that we need to discuss.

CHAIR BEACH: Okay. I believe it consolidated into the pipe. So, I'm -- I don't have anything else. Anybody else have a hand up?

MEMBER MARTINEZ: Josie, sorry, just -- I just happen to have that sentence pulled up. And it does say consolidation and concentration --

CHAIR BEACH: Okay.

MEMBER MARTINEZ: -- in the -- the report.

CHAIR BEACH: Okay, thanks.

MEMBER MARTINEZ: Just a point of -- point of information.

CHAIR BEACH: Sure.

DR. ULSH: Okay. Okay to --

CHAIR BEACH: Thanks.

DR. ULSH: -- move on to the next slide?

CHAIR BEACH: Yes.

DR. ULSH: All right. So, let me see. I've -- I'm out of line here. Hold on a minute. Just give me a second. There we go.

So, even if the green lube displaced uranium and thorium from the soil or the pipes somehow, which no evidence has been presented that that has -- has happened, and we do not agree that it did happen -- let's just think about this for the sake of discussion. It would pull off a fraction of the -- of the uranium and thorium present in the system, and it would draw it into a large mass of nonradioactive green lube. And so, the concentration would -- would go down, not up.

And this is the big disconnect for me. I don't see how the concentration occurs. And there -- and no evidence has been presented of a concentration, it's simply been SC&A asserting it with nothing to back that up. So, that is my primary problem with this entire scenario.

And secondly, even if you -- you buy the argument that it somehow concentrated it, it would -- if you've ever unclogged a drain, you know that the clog -- clogs in drain lines are not dry and dusty and respirable; they are wet, gooey, sticky. That's nonrespirable. So, that's another factor in the

source term where this argument doesn't seem to make sense. It doesn't make it more available for workers to be -- to inhale and become exposed to.

I will pause there because I suspect you'll want to discuss it.

CHAIR BEACH: I didn't actually have anything, but I will say that the concern was the mechanical means to remove the clogs from the drainpipes is what the concern was.

DR. ULSH: Yes. And that's on a coming slide.

CHAIR BEACH: That is coming up, so I won't say anything more on that. Anybody else?

MEMBER KOTELCHUCK: Josie, Dave --

CHAIR BEACH: Dave, go ahead.

MEMBER KOTELCHUCK: -- Kotelchuck. I wonder, we have 38 slides here. I wondered if instead of talking about each slide, as we have done, that we tried to cover two or three on a topic, on one of the specific issues, like we have finished now the green lube. If -- I would suggest that we go over the slides that Brant has on interior pipe contamination -- I think there are five of them -- and then ask our questions afterward. That way, I think we can make a little more progress rather than going one by one.

CHAIR BEACH: One by one -- yeah, I agree with that. I think we have covered everything on the -- the coagulants and green lube, so -- so the next top -- yes, I agree with that.

DR. ULSH: Okay, that's fine. And you'll notice that in the title, I do tell you how many -- what slide we're on out of how many on the topic, so that should facilitate that approach.

CHAIR BEACH: Yep.

MEMBER KOTELCHUCK: Thank you.

CHAIR BEACH: Okay. Thanks, Dave.

MEMBER KOTELCHUCK: Sure.

DR. ULSH: And thanks to Glenda Leary for making me put that in, so that we can do it that way.

Okay. So. to close up the discussion on the green lube, SC&A did cite a handful of references when they discussed the green lube issue coagulant. One of those -- I did pull up the references and quickly scan them. One of them dealt with the removal of pharmaceuticals from wastewater. I don't think that's a relevant reference. Several of them made the point that common coagulants used in wastewater treatment plants are aluminum or iron salts, and those substances are not lubricants so I would say that those are not really relevant either.

Now, there were a couple of them, the references that SC&A cited, that discussed plant based coagulants. These were presented as natural alternatives to, you know, aluminum or iron salts. They were specific compounds derived from, I think, the seeds of a specific plant. And I would point out to you that just because a substance is plant based -- I mean, there are millions of plant based substances in the world, and just because they're plant based doesn't make them functionally similar to a coagulant in a wastewater treatment plant. So, those references don't cover industrial lubricants in general, and they certainly don't cover green lube specifically. And so, at the end of this discussion, I'm still left with there's no evidence that green lube can function in the way that SC&A has presented it as a

concentration mechanism for uranium and thorium.

So, that's the end of this topic. Do you want me to pause here for discussion or move on?

CHAIR BEACH: I just wanted to say one thing is that I believe SC&A provided those references to serve as an illustration of how the conglomerate mechanism worked, not to say that it was -- the chemical actions were identical to anything with water treatment. So, I think it was more of a -- you know, this -- this is some of the literature that's available. So, that's -- that's all I had on that. Not really a question.

DR. ULSH: Okay.

CHAIR BEACH: Anybody else before we move from this topic?

DR. ULSH: All right, hearing none, moving on. So, we got five -- five slides here. The topic is internal drainpipe contamination. And this is a quote from -- from SC&A's latest report. And it may not be obvious why I'm focusing on this point. I want to talk about the mention of cutting torches. And it'll be, I hope, obvious in a minute why I'm making an issue out of this.

SC&A continues to assert that several tools were used to cut pipes at Metals and Controls, including cutting torches. And the reason that cutting torches is an issue for me is that SC&A suggested that we look at the Bridgeport Brass hazard assessment, which we did. We didn't introduce that into the conversation; SC&A did. And so, we just simply responded to the concern that SC&A raised. And they -- SC&A asserts that there were several tools used to cut pipes at Metals and Controls, and they included cutting torches. We do not agree. There is no evidence that cutting torches were used.

Why is it important? Because cutting torches are high temperature, and they generate fumes and they can generate -- they can be among the highest exposure scenarios that -- that would exist for cutting these pipes. But cutting torches are not commonly used on vitreous clay pipes or cast iron pipes. They are commonly used on carbon steel pipes because carbon steel is so much harder and less amenable to being cut by saws and snap cutters. At Metals and Controls, the pipes were largely cut by snap cutters. They also used saws when necessary. We see no evidence whatsoever that cutting torches were commonly used to cut these drainpipes. So, this is one of those situations where I want to nip this in the bud before, you know, somewhere down the road it just becomes accepted lore, and we have to fight that battle then. So, I want to make it clear that we don't agree about torch cutting.

However, we do agree -- I mean, there's no disagreement here, that they used power tools. They used snap cutters. They used power snakes. They used saws. And that those, particularly power snakes and saws, would have the potential to resuspend contamination and make it available for workers to inhale. Less so with snap cutters. So, there's no disagreement there. SC&A and us appear to be in agreement on that part of it. We just disagree about the torches.

MEMBER KOTELCHUCK: Okay.

DR. ULSH: So, the data -- this is going to be a long slide, so hang with me here. I just -- whoops. I just want to kind of summarize the data that is available, because I think we're talking past each other. There's a lot of semantics involved. There are -- there are six scale samples that were

collected from the inside of pipes. There's 12 direct beta simulator -- scintillator readings, there's additional sampling of -- of surface contamination from pipes, 20 sediment soil samples, and this data that we're talking about here was not meant to be representative. It was meant to be biased high because it focused on the areas of highest contamination. The pilot study was intended to be representative. The follow-up study in '95, which was reported on in '96, focused on the areas of highest contamination potential, it is biased high, and that supports the conservatism of the 95th percentile soil contamination value that we've picked.

Now, this is from page nine of our most recent response paper. NIOSH relies on the available source term survey data because it is -- because of comprehensiveness exercised by Weston and Texas Instruments, as indicated in the following December '94 statement. And here's the statement: The Texas Instruments environmental department and its consultants retained counsel, performed a review of historical documents, including reports, drawings, maps, photographs, previous RAD surveys, and interviewed employees who had knowledge of past nuclear operations in order to identify those areas that had the potential for residual contamination.

Now, regarding the existing scale, Weston performed intrusive drain line sampling, according to their sampling analysis plan, which was submitted to the Nuclear Regulatory Commission in July of '95. And that plan provided a method to identify contamination in the concrete floors near building 10. In addition to the systematic sampling that was prescribed by

NUREG guidance, and that is NUREG/CR-5849, if you want to know, Weston collected biased samples at the cracks and other locations across the grid exhibiting surface activity. So, that's the point that I want to make, is that this data is biased high. It is not necessarily meant to be representative. And so that's the point that I want to make there.

All right. Let me see. I've forgotten how to drive. There we go. This is the quote from SC&A: The -- the cited sampling of scale is very limited for the purposes of characterizing the range of activity levels within the M&C drainpipes. And I added that emphasis. That's my emphasis, not SC&A's. Well, all sampling is limited. If you are doing a sampling plan, it is less than 100 percent sample, so of course, it is limited. But we assert that it is comprehensive. It is more comprehensive than what was previously accepted by the Board at other sites.

Now, I think that is the end of this -- my slides on this topic, so I will pause. What do you want to talk about?

CHAIR BEACH: Okay. Anybody have their hand up?

DR. ULSH: I don't see anybody have their hand up.

CHAIR BEACH: All right. I'll start off on your slide three of five.

DR. ULSH: Okay. Let me see if I can go back. There.

CHAIR BEACH: I'm pretty sure that the -- the workers at Metals and Control (sic) confirmed the use of torches to cut pipes at -- at Metals and Control. But I believe SC&A makes it clear that all of these mechanized tools could have generated respire -- respirable particles; the cording -- the cutting torches would have just been the worst case, so.

DR. ULSH: I think we might be saying the same thing. We don't

deny that cutting torches were used in Metals and Controls if they were used on carbon steel pipes. What we're saying is that the pipes that we are considering here, these priority-one drain lines are cast iron and vitreous clay. And there's no evidence that torches were used on those kinds of pipes. It would be very -- it would be very unusual to use a torch on those kinds of pipes.

CHAIR BEACH: Okay. I agree with that. So, we're in agreement that the cutting of pipes with the torch and other mechanical devices was -- was actually done. And that's where the concern comes in. Anybody else on this slide, have a question or comment?

The next one on four or five, didn't SC&A question --

DR. ULSH: Josie, David Kotelchuck had --

MEMBER KOTELCHUCK: Josie, sorry, I had --

CHAIR BEACH: No, go ahead. Dave, go ahead.

MEMBER KOTELCHUCK: We have representatives of the claimants; they may be able to shed some light on whether such torches were used or not. What -- what Brant has suggested is that they shouldn't have been used -- they're not commonly used for those kinds of cast iron and other pipe -- the vitreous pipes. So maybe -- maybe he can give some -- shed some light on it, perhaps later when we have -- when -- when he speaks, if he chooses to speak.

CHAIR BEACH: Sure. And I believe he probably will. And -- and definitely we can -- we can ask him to comment on that.

MEMBER KOTELCHUCK: Yeah, I'd like --

CHAIR BEACH: I'm sure he's listening and is making notes. So,

thanks, Dave.

On the next slide, your long slide, four out of five, didn't SC&A question the adequacy of the six scale samples and beta readings? I thought there was only two actual scale samples that could be used.

DR. ULSH: It is my understanding that there are six scale samples, and they -- SC&A did have a concern about the direct beta scintillator values and I think I -- no, I would have talked about it here. So, --

CHAIR BEACH: Can you back your slides up one also?

DR. ULSH: Sure.

CHAIR BEACH: You're on five.

DR. ULSH: Hold on a minute, yeah. I'm driving two computers and not doing a good job. There --

CHAIR BEACH: Sorry.

DR. ULSH: -- how about that?

CHAIR BEACH: Sorry, I'm doing the same thing over here. Okay. And I'm sure SC&A is going to comment on that, but I'm pretty sure you said six scale samples, but I believe only two of them counted.

And then my last comment is -- is the last bullet. Isn't the question whether the 1 million dpm, the 100 centimeters squared is maximum and without adequate sample size? Isn't there no way to know that?

DR. ULSH: Well, again, these measurements were biased high based on a preliminary survey of where the contamination would have been found. So, they revisited those areas and sampled those. So, they are biased high. Yes -- now, first of all, the reason that we didn't include the -- the 1 million dpm value that was a scale -- or that was a measurement taken inside of a

pipe. And the bounding scenario is -- that we've presented is the contamination in the soils. And when you think about these pipes and the operations involved in excavating them and cutting them, the actual cutting of the pipes takes usually a matter of seconds. I will -- I will agree that sometimes it takes a matter of minutes. And we have modeled the scenario where the workers are working around these pipes and in the soil for months. So, this is a very small episodic exposure potential. We did do some very -- in response to that SC&A's concern on this point about the scale, we did evaluate quickly, the impact of including the scale that 1 million dpm per square centimeter value, and it would raise our bounding dose by a few millirem. So, it's -- it doesn't have a significant impact whether we consider the scale scenario. Our position is that the soil bounding scenario is the bound -- or the soil scenario is the bounding scenario.

CHAIR BEACH: Well, it seems to me like there is not an adequate number of representative scales sample results.

DR. ULSH: Again, not meant to be representative. It's meant to focus on the areas of highest potential.

CHAIR BEACH: But we're not certain that is the highest potential.

DR. ULSH: Well, now you're going into trying to prove a negative. All I can tell you is that in the preliminary survey, the pilot survey, they took representative samples, and then they identified the areas where there is highest potential, and they revisited those areas and focused on them. If you want to say, well, there might -- I mean, of course, it's less than 100 percent sampling, as it is at every single site. And if you want to say that

well, there might have been some reason why they weren't representative or didn't identify the areas of highest contamination. If there was some reason for that, I mean, we could entertain it, but we don't have any evidence that that's the case.

I mean, this was a pretty rigorous survey. It was done -- it was approved by the NRC. It was typical of what you might find in a Marcem (ph) framework, and we just don't have any reason to think that. They did capture the 1 million dpm around because it was in an area that they had identified a high potential. So, you know, you can always say well, if it's -- if you take a sample -- a set of samples that are less than 100 percent sampling, you can always say well, you know, there might be a higher one out there, go prove that there's not. There's no way to do that.

CHAIR BEACH: Yeah, well, and -- and honestly, this -- the samples were taken in '95. My main concern is what was going on in the 27 years prior to that sample being taken. So, I guess, let's move on. We'll -- this will come up some more.

Any the other comments by work group members? Only -- I only had one more on the last one, but I don't want to step on anybody if their hands are raised or -- or just speak up because I can't see hands.

DR. ULSH: I can see hands. Oh, wait. I think David's got his hand up.

CHAIR BEACH: Go for it, David.

MEMBER KOTELCHUCK: Oh, my -- pardon me. Excuse me, I did not lower my hand.

DR. ULSH: Okay.

CHAIR BEACH: Okay. The last slide, I just wrote a comment -- but on the SEC question of sufficient accuracy, the adequacy of the data upon which a bounding value is based is important, right? Do you agree with that?

DR. ULSH: Of course.

CHAIR BEACH: Okay. That's all I had. We can move on to confined spaces unless there's other -- others that...

DR. ULSH: Okay. And here --

MEMBER VALERIO: Josie, this is Loretta. I have a question.

CHAIR BEACH: Yep. Go for it, Loretta. Yes.

MEMBER VALERIO: Yes, so -- and it's more for clarification, but in of the white papers, I read that the clay pipe was the highest interior surface contamination did not contain a visible -- and I emphasize visible -- accumulation of residue. If you either NIOSH or SC&A can clarify that for me, because what I remember is contamination is not -- and I understand that they're stating that the residue was not visible. But the -- the -- again, the word visible is a little confusing to me because I'm thinking about the clay pipes, if they were coated with a saw or a torch or whatever, if they're really old, and again -- correct me if I'm wrong -- I would assume that they would be more apt to -- to just crumble. And I'm just wondering, you know, where does the visible part of all -- of the -- the accumulation come from? How much was sampled? They all say that only a small sample of sediment or the residue was collected. How small was that sample?

DR. ULSH: I'm not quite sure I'm following you but let me take a crack at it. The word visible was just taken -- it was a quote from -- I think

it was probably Weston's report when they were describing the location where they collected the samples. And it's not uncommon for surface contamination to not be visible. That's not how they identified the areas where contamination is likely. They did that by gamma scanning surface walkovers and these direct readings in the pipe. So, it was radiation detection. That's how they identified these areas, not by visible inspection.

I don't know if that's really the point you were trying to get at though. Is it?

MEMBER VALERIO: That -- yes and no. So, yes, I -- I understand you. They -- they use their instruments to monitor for contamination. I understand that. But if there was a part of the pipe, this clay pipe, that was not clogged, did they -- and I'm confusing myself here.

DR. ULSH: Take your time. Let's see if --

MEMBER VALERIO: I understand that they --

DR. ULSH: -- towards -- towards the answer --

MEMBER VALERIO: -- and I --

DR. ULSH: -- to your question.

MEMBER VALERIO: Yeah. I understand that, you know, they -- there was no visible accumulation of residue. And that's, again, very confusing to me. I understand they used the instruments. I understand they were taking readings, things like that.

But the next statement was after the pipes were opened, a small sample of the sediment or the residue in the pipe was collected. So, I guess, my question is, going back to how small was that sample? Was it -- did they do monitoring down several feet of that pipe, or just that one area

where they had a reading?

DR. ULSH: I am tempted to say just that one area they had a reading, but I'm gonna actually tap Pat McCloskey from the ORAU Team.

Pat, can you shed any light on this question?

MR. MCCLOSKEY: Sure, Brant. I'll be glad to try to help out there, Loretta.

I think what might be helpful -- you make a good point, Loretta, that, you know, contamination isn't often visible to the naked eye, so we do need instruments. That's a good point. But I think if we think about why Texas Instruments was doing the survey in the first place, it's helpful because what they were trying -- so, when they -- they knew they wanted to release the site, from (indiscernible) controls, released the NRC license, and they did a pilot study to start doing some D&D, and they found a few fuel rods in the system. And they got concerned that there'd be a criticality concern, you guys might have too much uranium down in the pipe -- piping system, and you have maintenance workers are doing ongoing maintenance that we need to protect. So, we have -- we have two concerns: criticality and ongoing maintenance work.

So, when they do the characterization of the drain lines, they're actually looking for an accumulation of material in the drains to see if there's a bulk amount of uranium for the -- for the criticality concern, and they'd be looking for things that the maintenance workers would be unclogging. So, they are actively looking for visible material. And when they didn't see it in that clay pipe that is often referenced with the highest million dpm value, they weren't getting instruments from their detectors they always had

handy, saying there's something there. Let's -- let's take a reading of it to see -- to quantify it. And so, although there was no sediment there, there was contamination, maybe six to the clay pipe that they got the million -- million dpm reading. Does that help, Loretta?

MEMBER VALERIO: Sorry, I was unmuting. Yes, it does. And thank you for that. But did you mention that there were a few fuel rods? Did I hear that

correctly?

MR. MCCLOSKEY: I'll have to go reread it. It's been a while. I'm sure there's others on this call that know the -- that quote. There was at least one that they found. It's, like, one by -- I forget the measurements, but it's -- if we go read that characterization document, it's all contained within there. I can -- I can go look that up and let you know later.

MEMBER VALERIO: Yeah, I -- you know, I remember that -- you know, I vividly remember the one with the highest count, that I do remember. I don't remember specifically -- and Josie or Dave or anyone can refresh my memory -- I don't remember there being a few, and so --

CHAIR BEACH: Yeah.

MEMBER VALERIO: -- then that raises -- and then that raises a question, you know, if -- on this one area where there was that high reading, a small sample of the sediment or the residue in that one location where that high reading was taken and there were more than -- one said there was more than one area where there were fuel rods that were maybe stuck in the drain, maybe not closing it off completely, but just stuck in there, were any samples taken of those? Does that make sense?

DR. ULSH: Well, I understand what you're saying. I want to say that I'm only aware of one fuel rod found in the drain. Pat, is that --

MR. MCCLOSKEY: There it is. I found it. This is SRDB 165965.

DR. ULSH: Yeah, that's the right one. Page 10.

MR. MCCLOSKEY: After a feed line floor penetration serving an overhead roof drain was sampled and an elevated reading was identified and investigated. The feed line was excavated to a depth of three feet where it attached to a four-inch cast iron mainline. After the excavated lines were broken and removed, a small uranium rod of approximately five inches in length and half inch in diameter was identified and retrieved. And then while retrieving the rod, it was noted that the surrounding soils and pipes also exhibited elevated radiological measurements. So, they did some surveys around that area as well, Loretta.

So -- so, just one caused them to -- to go into this full investigation or characterization of the subsurface to protect ongoing maintenance of the drain lines and because of the criticality concerns that could pop up.

DR. ULSH: So, only one?

MR. MCCLOSKEY: Yeah.

CHAIR BEACH: It -- and I do remember an interviewee noting that he had a fuel rod in his pocket, and he was showing it to people at one point. I don't believe that was the same one that came out of the drain line, but I don't recall at this time where that came from. I've read those interview notes so many times, but. So, I think there was more than -- more than that one.

DR. ULSH: I mean, they were Working on these fuel pins. That was

the work that they were doing there, but we've got --

CHAIR BEACH: Yeah.

DR. ULSH: To the best of my knowledge, we only found -- there was only one fuel pin that went -- that was found in the drains. I'm not aware of any evidence that there were more. So, our position is that there was this one fuel pin, and that that's the bounding scenario. I think we covered this pretty extensively.

CHAIR BEACH: Yeah, we did. Can I -- can I -- this is Josie. Can I go back and just comment on what Pat said when you were answering Loretta? They -- they -- they were trying to release the license, and I believe they were investigating if that particular pipe that she was commenting on -- that was more for disposal of those pipes in '95, not necessary -- and maybe for the workers that were going to come in and dig that up -- it really wasn't done to protect the maintenance workers that were cleaning it and unclogging those pipes, as you said. This was after.

DR. ULSH: I'm going to jump in there, Josie, to say that --

CHAIR BEACH: Yeah. Go ahead.

DR. ULSH: -- that that's going to be the subject of a later slide.

CHAIR BEACH: Okay.

DR. ULSH: So, maybe we can put a pin in that and defer it to later.

CHAIR BEACH: Sure. Okay.

Anything else before we go on to the confined space slides, number 17? I think we're ready to move on. Thanks everyone.

DR. ULSH: Well, let me apologize. Apparently, it's the first Tuesday of the month when they test the -- the tornado alarm, so if any of you can hear

that, I apologize. Hopefully not.

So, confined spaces. This is a quote that I pulled out of SC&A's latest response document. The way I interpret it is that now, at this point in time, is that SC&A and -- and NIOSH are now in agreement that confined spaces is a TBD issue and not an SEC issue. I am hesitant here, because I want to make sure I'm not misrepresenting SC&A's position, and I'm sure that they will correct me in the upcoming presentation if I am.

So, with that caveat in mind, I want to make sure that everybody understands NIOSH's position on the confined-space issue. We do agree that we need to revisit OTIB-70 and TBD-6000 and consider the issue of confined spaces in general in the framework of those two documents. We do not agree that confined spaces is an SEC issue at Metals and Controls. And we don't agree that it's even a TBD issue. There was confined space work at Metals and Controls, but it is not the -- confined spaces is not an issue on these priority-one drainpipes that we are considering. That's our position.

Now, I want to tell you the definition of a confined space, and this comes from OSHA. It's a quote: A confined space also has limited or restricted means for entry or exit. Confined spaces include, but are not limited to, tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, etc, etc.

Now Weston, in the '97 Weston document, section 4.4.1 said that: In the current exposure scenario, maintenance workers excavate a trench 10 meters long, three meters wide, and 1.5 meters deep. So, for those of you who don't like a metric system, roughly -- 10 meters is roughly 30 feet long, roughly nine feet wide, a little more, and maybe four feet deep. So,

somewhere between your waist and your chest, and it's open at the top, and it's not a confined space. So, that is our position.

If you want to discuss it more in the framework of a TBD issue, we will participate in that conversation, but our position is that confined spaces is not an SEC issue at Metals and Controls. That's been our position all along. It's our position now.

MEMBER KOTELCHUCK: Um.

DR. ULSH: I thought I heard someone maybe?

CHAIR BEACH: Yeah, Dave.

MEMBER KOTELCHUCK: I thought that we had discussed this and that there are these lesser depth of -- of trenches, but that we discussed that trenches, in some cases, were five to 10 feet underground, not -- and that constitutes an area in which we have to acknowledge that that's a confined space in -- in the OSHA definition. Am I -- are -- is there a -- is there debate about that? I thought that was established in the record that five to 10 feet, not a -- some of it, obviously, as you're pointing out are lesser -- of lesser depths.

DR. ULSH: The priority-one drain lines that we use in our bounding scenario were -- the trenches are about 1.5 meters deep based on the location of the pipes below the surface, and we're saying that that is not a confined space. Does that -- I don't know if that answers your question, was it?

MEMBER KOTELCHUCK: Well, I think this is a matter of record. And that I -- I do disagree with your citation on the record. I think it's -- it's not sufficient, that in fact, there were deeper ones. Again, we could ask the

claimants when they come on about the depth of it. I believe it's in the record.

DR. ULSH: There were --

MEMBER KOTELCHUCK: I was not -- I did look into this. I looked into the definition of confined space since this was coming up. And that's an important distinction. You're right, there -- there -- there's a distinction between three or four feet deep and five to 10 feet deep.

DR. ULSH: And to be clear, we do agree that there was other work at Metals and Controls. I think there was a vault, I think there was a manhole outside. Those -- that work did not involve radioactive materials. It would have -- it would be confined spaces, but these priority-one drain lines were one and a half meters deep, so.

MEMBER KOTELCHUCK: Okay. And that's -- I -- that -- that is certainly not my recollection based on the record, but -- but -- I will -- let's -- let's try and determine that. So, I don't -- I don't agree that they are -- that this is not a confined space issue until -- certainly we need to resolve that, factually resolve that issue, and the record.

DR. ULSH: Okay. If there's -- if there's anything in the record that contradicts that, I would change my position, so.

MEMBER KOTELCHUCK: Yeah, and I will certainly look and try to find it myself, of course.

MEMBER MARTINEZ: Dave, can I just ask a quick logistic-clarifying question? When you say, "on the record," you mean, basically, previously discussed in this group, right? Is that -- is that what --

MEMBER KOTELCHUCK: That's right --

MEMBER MARTINEZ: -- you mean? Okay.

MEMBER KOTELCHUCK: Previously what -- not just previously discussed but -- but in the reports of -- of the physical discrete -- describing the physical sight and the work that was done.

MEMBER MARTINEZ: Great. Thank you.

MEMBER KOTELCHUCK: So, in that sense, yeah, it wasn't just a matter of I think this, you think that. That there's somewhere in the record of -- of the technical record that it was five to 10 feet.

CHAIR BEACH: Dave, this is -- this is Josie. I do agree with that. This has been going on for seven years, and, and we can go back and locate that. But I'm pretty sure that we talked about the trenches being three to four feet deep, and that OSHA defines a confined space as the breathing zone. And I believe it's been pointed out that if a worker is cutting a pipe or -- or cleaning out a pipe, their face is down closer to that pipe than up in -- in the atmosphere. So, --

MEMBER KOTELCHUCK: Okay.

CHAIR BEACH: -- I'm pretty sure you're correct. And that this still constitutes an issue that hasn't totally been clarified. Now, I'm not saying it's not a TBD issue at this point, Brant. But there are definitely some issues with the -- with the confined space. We had three to four foot trenches, and there was also eight to 10 feet. The bracket line, I believe, is what comes to mind. And so that current dust-loading factor does not reflect confined spaces at all. And that's issue two, that I believe we're going to get to next on the Mound data. So, it's kind of a little bit intertwined here.

MEMBER KOTELCHUCK: Uh-huh. Okay.

DR. ULSH: Well, all this discussion that we're having, I think, is appropriate for a TBD framework because even SC&A and us both agree that you can model dust concentrations all the way up to choking. And that's the idea of a confined space is that it concentrates the -- the material that can be respired. We -- again, our -- I want to be very specific about what our position is. We're not saying that there were no confined spaces at Metals and Controls. We're saying that for the scenario that we're looking at here, the priority-one drain lines, those were three-and-a-half to four-foot deep trenches. Now, if you want to debate this issue, we will participate in that in a TBD framework. It sounds to me like we're all in agreement that this is perhaps not an SEC issue. I don't know if that's stating it too strongly, though.

MEMBER KOTELCHUCK: Let me ask -- may I turn around and ask you, why is it not an SEC issue? The SEC is to be determined if we have -- we have -- if the model bounds, gives an upper bound and is plausible?

DR. ULSH: Because --

MEMBER KOTELCHUCK: Plausibly reflecting the work that was being done by the maintenance workers?

DR. ULSH: Well, the reason I said that --

MEMBER KOTELCHUCK: Why isn't that an SEC issue?

DR. ULSH: Yeah. The reason I said it's not an SEC issue is because based on the comments that were just made, the quote here from SC&A on the slide, and I really hope I'm not misrepresenting their position and also Josie just said, I think, that she said it's a TBD issue, and we agree that it's a TBD issue. That's what I based that statement on. And, I think, I -- at

least my position is that even if confined spaces are an issue, our position is that it's not, but even if you say that it is, I don't think anyone is asserting that confined spaces can't be modeled, that it's totally unboundable.

CHAIR BEACH: Well, -- and Brant, this is Josie. Again, I think the problem here is not necessarily whether it's a TBD or an SEC at this point. I believe you're correct, SC&A agrees that there's much work to be discussed on this issue. It's not completed yet. But I think it's how you're describing the -- you're describing what Weston described as what went on. We're trying to get to the fact that it was 27 years of maintenance work that you're not considering. They dug down deep underneath the pipes to get a snap cutter around the pipe. That went in farther than what you're saying was done. So, I think that is the real problem with this discussion is there's two different things being discussed at this point. And we're mostly interested, or I personally am, is the 27 years, not what happened when Weston got in there and did the job that they did in '95.

DR. ULSH: Well, Josie, the drainpipes didn't -- the drainpipes didn't move over the 27 years. We have the layout of where the drainpipes were. We know how deep they were buried. They were -- the depth didn't change over 27 years. They were about three feet deep. So, you wouldn't dig a 10-foot deep, 20-foot deep trench to access those.

CHAIR BEACH: And I'm not suggesting that. But they dug at least a -- if it was a three fed -- three-foot deep pipe, they dug at least four to five feet to get around it, so that they could cut it out and clean it out. That -- that's just my -- that's my only point on that.

DR. ULSH: Even so, that's not a confined space.

CHAIR BEACH: It is if their face is down in that pipe.

DR. ULSH: Okay. I think we're gonna have to agree to disagree on this.

CHAIR BEACH: Okay.

MEMBER KOTELCHUCK: Okay. Okay.

CHAIR BEACH: Anyone else? All right. Brant, I think you can safely move on.

DR. ULSH: Okay. Dust loading. So, this is the quote from SC&A's report that they stand by their original finding two the application of Mound data for dust loading does not satisfy the sufficient accuracy given that those sites were different. This -- I would just want to point out that this was not SC&A's original finding. SC&A's original finding was this back in 2021: They examined our -- the values that we use for dust loading. Here is where they concurred with that value, although for reasons different than -- than we presented. They said that it was prudently conservative estimate. It was consistent with a NUREG document. That was the position in 2021. I understand completely that SC&A's position today is different. I understand that the working group never concurred on this issue. I understand that. But that was the original position.

SC&A suggested in 2021 that we refer to the NUREG document in addition to the Mound outdoor data, and I actually agree. Recall that I only came into this process here in April, and I was kind of scratching my head over why we were applying Mound outdoor data to -- to M&C indoor data. The connection wasn't intuitively obvious to me, and so I had to go back and find out why we had done that and learn the history of it. But the bottom

line is SC&A -- SC&A said, the value looks good, but you should cite this NUREG document, because that makes it a more clear reason for why this is a good value. And I actually agree with that. That's -- that's a much more logical connection. We concur with that. We concurred with it then, we concurred with it in our August paper, and we concur with that now.

I think that's the end of dust loading, so pause again.

CHAIR BEACH: Yeah. I just wanted to remind everyone that the use of Mound data goes to the question of surrogate data use. Confined spaces did not figure into that monitoring, and NIOSH has agreed to revisit the confined spaces and the dust-loading factor. And it may be affected by -- by that -- by the TBD review. So -- so, I think early on, the work group did not agree with the Mound data use on the surrogate data issue. And SC&A, I think, brought in early, early on -- this goes back several years -- they brought in a different model that they were using. So --

DR. ULSH: -- it's my recollect --

CHAIR BEACH: -- a lot of history.

DR. ULSH: Yes, there is a lot of history, some of which I wasn't here for. But it's my recollection reading through the records that SC&A did their own analysis of -- of our dust-loading value. They ran it through the criteria that the board uses for sufficient accuracy. They pointed out that when we cite Mound data as a backup -- as -- as a supporting data for our dust-loading value, that may not be compelling, may not be convincing.

And they looked at the values suggested in NUREG document that's on the slide here, which is an industry standard, and they compared the value that we proposed to the values in that guidance document, and it compared

favorably. And they suggested that rather than this citing Mound, which is not obvious to everybody, then cite this NUREG document. And we agree with -- I agree with that. I think it was a great suggestion. And it's a much more obvious connection.

DR. ULSH: Okay. Can I --

CHAIR BEACH: Any --

DR. ULSH: -- go on?

CHAIR BEACH: Any comments anyone? Speak up. If not, yes, I think you can.

DR. ULSH: All righty.

MEMBER KOTELCHUCK: The three-legged stool that was talked about in the past talks about the Mound data, not the NUREG data. And the -- I mean,

the Mound data simply doesn't follow our regs about what is -- what is an appropriate model for -- for our -- this trench work.

CHAIR BEACH: Yeah, you're -- you're right on with that, Dave.

MEMBER KOTELCHUCK: Yeah.

DR. ULSH: Okay. The important thing here is the number that we're proposing. You see it there in the first bullet.

MEMBER KOTELCHUCK: Yeah.

DR. ULSH: And SC&A compared that to the guidance in NUREG. I don't think anyone is saying that the NUREG document is insufficient, and our value compares favorably with that the guidance in the NUREG document. So, if you don't like the Mound citation, I don't love it myself, compare it to the NUREG document.

MEMBER KOTELCHUCK: Well, that's -- yet we still talk about the Mound data. Okay. It does -- I mean, I -- I believe I've -- I've looked at that NUREG, and does it compare favorably; yes. So, I can just, if you will, I -- we could -- we could pick out -- pick it out of the house saying this is standard, so let's use it.

CHAIR BEACH: Well, and, Dave, just if this will help, we won't be discussing the TBD issues until we get through with the SEC issues. That will come later.

MEMBER KOTELCHUCK: Okay. All right. Thank you. Okay.

DR. ULSH: Is it okay for me to move on to the next topic, which is intrusive activity?

CHAIR BEACH: Yes. Go for it, Brant.

DR. ULSH: All right. So, we are proposing to use survey data from -- the survey was conducted in '95, reported in '96 through the -- through the residual period. It is similar to what we did at Chapman Valve, which also involves work that included -- it was diverse, it was intrusive, it was similar to the situation, not identical. No two sites are identical. Similar to the situation and Metals and Controls. It's also similar to Linde. Not identical but similar. Linde involved subsurface maintenance utility work -- and by the way, despite our disagreement about confined spaces, Linde did involve confined spaces, and also with Vitro.

So, the Board concurred with all of those situations back-extrapolating the data. And what we're proposing Metals and Controls is similar to the -- to what we did at those other sites. Now, in my next couple of slides, I'm going to be talking about the back-extrapolation at Metals and Controls over

the entire maintenance period. So, I would ask that if you want to take me to task on that, postpone for one or two slides. But that's --

CHAIR BEACH: (Indiscernible) we -- we can do that. However, I was surprised to see Linde in here because we did -- we did agree that that was an SEC site, so -- but I'm sure that'll -- we'll talk about that some more.

DR. ULSH: Yes. That was -- part of the time period at Linde was an SEC site and part of it was not if -- if I recall correctly. And the part that was an SEC did not hinge on this particular issue. That's my recollection anyway.

All right. Data applicability. So again, the bold is my added emphasis. It was not in SC&A's original. And the Board asserts that the judgment on whether there's sufficient similarity of conditions between the D&D era during which the '95 characterization sampling was conducted and the preceding Metals and Controls period resides with the Board.

Yes, sort of. I mean, NIOSH makes its recommendation. The Board will make whatever recommendation you all see fit to make. And then it goes to the NIOSH director who will make his recommendation, and then it goes to the Secretary who decides the issue. Just to be clear about the process here for the people who are new.

The reasons -- I want to take issue with this subtle shift of the survey out of the maintenance period and into the D&D era, because that's not accurate. That's not what Weston said in its report. The purpose of the '95 survey was to bound the exposures to ongoing maintenance workers who were nonRAD workers. Here is exactly what they said in Section 4.4.1: Scenarios evaluated include -- included maintenance worker intrusion into

any of the primary source areas, and that includes building 10 -- to perform underground maintenance. Maintenance worker intrusion into any of the source areas was selected as the bounding scenario for dose assessment. Then they go on, and they say: Under the current exposure scenario, TI, Texas Instruments, maintenance workers are assumed to excavate into contaminate -- contaminated areas within a few buildings, one of which is building 10, which contain the highest concentrations of residual radioactive materials. Therefore, dose assessment using an application of conditions associated with the building interiors assumed to bound potential doses. They were doing it to look at ongoing maintenance activities conducted by nonRAD workers. This is not part of the D&D era. It is part of the maintenance era.

Let me --

CHAIR BEACH: This is a 1995 to 1996 document, right?

DR. ULSH: Correct. Correct.

CHAIR BEACH: We're talking about 1968 through 1997.

DR. ULSH: Correct.

CHAIR BEACH: So.

DR. ULSH: We've done that at other sites, Josie. We've taken the data from the end of the residual period and back-extrapolated, back-applied it to the preceding years. It's the same here.

CHAIR BEACH: Well, I disagree that it was the same, but I'll leave it at that at this point.

DR. ULSH: Well, I'm not even claiming that everything is identical. But what I'm saying is to call it part of the D&D era is not correct. The D&D

era had not started yet, and the stated purpose of the survey was to evaluate the exposures that nonRAD maintenance workers could be exposed to during ongoing maintenance activities.

CHAIR BEACH: Okay. It just -- it feels like we're splitting hairs here, so let's -- let's continue.

DR. ULSH: All righty.

MEMBER KOTELCHUCK: We are -- we are not talking about the facts, but the characterization of the survey, right? You're saying it's part of the -- it's not part of the D&D era?

DR. ULSH: That is correct.

MEMBER KOTELCHUCK: And -- and -- and indeed there were a couple of more years left in the -- in that era.

DR. ULSH: That is correct. And the reason I'm making an issue of this is because everyone acknowledges that the activities during the D&D era were different than the preceding residual period where maintenance work was ongoing. And to try to subtly put this survey into the D&D era makes it appear that it's not applicable to the maintenance era when the stated purpose of the survey was to evaluate the doses that maintenance workers nonRAD workers could have been exposed.

MEMBER KOTELCHUCK: One -- one purpose of it -- it was the beginning -- as I understand it, it was the beginning of the preliminary -- and I didn't quite follow the -- your -- your quote a moment ago. But it was preliminary work to begin planning for the D&D work, which started in 1997. But also, it was said, and I agree, it was said that this also was part of the -- the maintenance period. And it was the last few years of the maintenance

period, in the last two years. So, that's a -- what we're talking about.

And in that sense, splitting hairs in terms of saying from 1968 to 1997, there was one set of measurements that was made, and it was not made on claimants. And we discussed before that we are not -- we're not using the exposures of the Weston workers in 1995 because they were trained, they understood what the hazards were, and they were careful. So, we're using the drainpipes from that -- the measurement based on the materials that came out of the drainpipes in 1995. I just think that it is subtle, -- I don't think it's a subtle move. I think -- I'm willing to say yes, that 1995 survey was in -- during the maintenance period and as part of the planning to begin the work, and the D&D era two years later.

DR. ULSH: I agree with what you said right there 100 percent.

MEMBER KOTELCHUCK: Okay.

DR. ULSH: Is it okay for me to move on?

CHAIR BEACH: Yes.

MEMBER KOTELCHUCK: Since you agree with me, move on.

DR. ULSH: Let's -- let's --

MEMBER KOTELCHUCK: No, I'm --

DR. ULSH: -- move on before --

MEMBER KOTELCHUCK: -- joking.

DR. ULSH: -- it all falls apart. Okay.

The next topic, let me see. Here we go. Let me drive my other computer. Extreme conservatism. Oh, boy. All right. So, to go to this slide or this topic, we have specified -- this is a term that NIOSH used, and we specified what we meant by extreme conservatism. It's conservative

assumptions that are appropriate for a bounding scenario. SC&A has -- has presented this as if it's the same as not sufficiently accurate. And I think the working group has expressed similar thoughts. Their assertion is based on their concerns about confined spaces and coagulant or green lube, which we have already covered, and the applicability of the sampling data from '95 to the earlier years, which we just covered. But those are -- our application of this data is consistent with 20 years of precedent for what we've done here, for what we've done in this program. Now, I understand that the topic of precedent is another one that you-all want to discuss. But I just want to point that out that this has been done for 20 years in this program.

MEMBER KOTELCHUCK: Yeah.

CHAIR BEACH: So, before you move on, I only had a couple of questions on your first eight slides, and they -- they're in -- within the first two slides. So, for that first bullet, didn't NIOSH define its approach SC&A cited it in a previous response, I believe the January 2023 paper? And are you retracting that definition, the extreme conservatism? That -- that's the first time I'd seen it. I think that's why it jumped out at me person -- personally.

DR. ULSH: The only part of extreme conservatism that I am taking issue with is using it synonymously with insufficient accuracy. That's the part I'm taking issue with. Yes, we use bound -- the whole purpose of bounding scenarios is so that you don't have to argue about how many angels fit on the head of a pin. It's to cover -- yes, it's to cover uncertainties. Not all uncertainties, but some. And my point is that extreme conservative -- conservatism is baked into the cake in this program. It's set

by law that we have to be extremely conservative.

CHAIR BEACH: Well, just sounds like you're rewriting the record on that quote that we took note of, the extreme --

DR. ULSH: Well, I --

CHAIR BEACH: -- conservatism.

DR. ULSH: I am not retreating from that quote. I'm not. What I'm saying is we never intended when we said extreme conservatism to mean insufficiently accurate, and I will cover the basis for why SC&A, at least, presented that they're making this argument here in the upcoming slides.

It was largely based on a quote from former board member Jim Melius. Here is the quote that SC&A presented, and I'll give you a couple minutes to read it. This quote was is -- was -- I contend that this quote is taken out of context. It was one quote on one page of a transcript from 2011.

That occurred in the broad framework of a discussion on exactly this issue, bounding doses and what is sufficiently accurate. And the Board had wide-ranging opinions on this. Some of you may remember because you participated in it. Board members Anderson expressed a position that was largely similar to SC&A's position here. Board members, Clawson and Lemon also raised some concerns. And I -- at the very beginning here, I want to encourage you to go back to the transcript and read the entire discussion. And SC&A has made it very easy for you to do that, to their credit. All you have to do is go to their latest report, go to the references section and click on the link that they have provided. And go to that page number and read the preceding and following pages so that you can get the

complete context.

I want to show you some quotes that were not cited by SC&A --

CHAIR BEACH: Wait. Before you go --

DR. ULSH: Yes.

CHAIR BEACH: Before you go there, -- sorry. This is Josie. I just want to point out that Dr. Melius's point was made in a NIOSH paper several -- a couple of years ago. I can't quote the exact paper. But it only quoted part of the discussion, which led me to go back and read the entire transcript. So, in the first place, SC&A was balancing the quotes that NIOSH used in the first place. So, that's -- that's why this whole conversation started originally was only a partial quote. And it still continues, I think, with your presentation today.

DR. ULSH: I have just stated that I am present -- I mean, obviously, I've already taken I don't know how long, but I can't recite to you the entire conver -- the entire discussion that occurred back in 2011, and that's why I'm encouraging you all to go back and read the entire thing so you can --

CHAIR BEACH: Well, yeah, --

DR. ULSH: -- fact check what we're -- what you're being told by us and by SC&A. So, in their report, though, from -- from November, this past month, this is the quote that SC&A presented from Jim Melius, but they did not quote current and former Board -- well, Board member Lockey -- wait, --

CHAIR BEACH: Well, I'm --

DR. ULSH: -- I'm all out of --

CHAIR BEACH: Well, I'm sorry, Brant. I just have to say the only reason that quote even made it to the white paper was because NIOSH

started the quote with only a partial quote. So, that's most likely why it didn't go further than that. So, sorry, I'm trying not to interrupt.

DR. ULSH: Well, can we agree that it would be best for all of the working group members to go back and read this conversation for themselves to get a complete picture of the conversation that occurred in 2011?

CHAIR BEACH: Absolutely. And I would have thought that the Board -- work group members on this committee have already done that. So, hopefully that's the case. But you're correct, when this goes to the Board, yes, I think we should point it out. Well, it's pointed out, so we're fine. Go ahead, Brant. Sorry.

DR. ULSH: So, here's the quote that SC&A presented. Here is a quote from Jim Lockey. It would be -- you can read it all, but I've -- I've bolded what I consider the important part, that it would be unreasonable in setting a high exposure level to apply to everyone. A high exposure level. Wanda Munn (ph) had this to say. I've got two slides on Wanda. I'll let you read the quote. Again, I added the emphasis, the part that I considered important, That it would be unreasonable to set a high-bounding exposure level. Here's more Wanda: Again, unreasonable and setting a high-exposure level. I think you can probably guess the theme that I'm getting at here.

CHAIR BEACH: Yes, I was just concerned that you mentioned Brad and Dr. Lemon, but you don't have any quotes or slides for them, so.

DR. ULSH: I could have made it 40 -- 40 slides if you'd like, but I'm just encouraging you to go back and read them.

Let me catch up here. All right. Now, here's the most telling thing, I think, is that Jim Melius is just a couple pages later, after the previous quote, had this to say: We've got a lot of uncertainty and uncertainty leads to a bounding level that is quite high. So, even Jim Melius specified that his concern was with setting very, very high bounding doses and applying it to everybody.

CHAIR BEACH: Do you mind if I stop you there, because I want to go back and -- when I read the transcripts, I was on page 124. You're a little bit further. But Jim Melius is also quoted as saying: The lack of information and no sampling data during renovation time period with little information, what was done at the site during this time period and how many people were involved. That seems to me just as appropriate to be designated an SEC. So, there's a lot of quotes and -- and I agree, we do -- people need to go back and read that. Linde mirrors quite well with M&C, in my opinion, in -- in what was done and the discussion that came forth.

DR. ULSH: Okay. I think I covered that slide.

MEMBER MARTINEZ: I'm sorry, can I ask a question while you're on a little -- little break, Brant?

DR. ULSH: Sure.

MEMBER MARTINEZ: So, it strikes me that this discussion, when I first came on the Board, this is the question that I had, that was -- what is it both bounding and sufficiently accurate if I'm getting the semantics, correct, right. And so how -- how you kind of make sure both of those things are happening seems to be that -- that people could interpret that in a lot of different ways, which I think is the point you're making here. But my point,

then is it seems like this question wouldn't just apply to M&C, right, if this was Linde. So, it seems like this question -- I -- I guess my question is, is this just for Metals and Controls right now, or would it or is this a bigger question?

DR. ULSH: I don't know that there is agreement on the answer to that question, Nicole.

MEMBER MARTINEZ: Okay.

DR. ULSH: One of the points that I am trying to make is that I'm appealing to precedent that has been used at other sites. So, and I'm also in a -- in a slide or two --

MEMBER MARTINEZ: I see.

DR. ULSH: -- in a slide or two, I'm going to point out that the bounding dose that we're proposing at Metals and Controls is very, very low. So, it does not present the same kinds of sufficient accuracy concerns that would apply if we were applying instead of 71 millirem if we were saying 71 rem, that's different. That would --

MEMBER MARTINEZ: Yeah, that's different.

DR. ULSH: -- present a sufficient accuracy concern. And part of my concern here is that to do such a thing would be reversing the precedent that has been established over the past 20 years. And it would apply --

MEMBER MARTINEZ: Okay. So -- so --

DR. ULSH: -- beyond M&C.

MEMBER MARTINEZ: So, my -- my question is -- is fine to have that question, but really, you're saying this is what been done in the past and how that applies in the current situation. Okay, thank you.

DR. ULSH: That is my position. I don't speak for the working group or SC&A on that point.

CHAIR BEACH: Well, I --

MEMBER MARTINEZ: That's the argument you're making then?

DR. ULSH: Correct.

MEMBER MARTINEZ: Thank you.

DR. ULSH: Okay. I think this is where I left off. I'll move on. And this is more Jim Melius, just to close out this this section, that during residual period, there may be different activities, but it's unlikely to lead to as high exposures or unusually high exposures. Again, high. And so, the OTIB-70 approach is something that is appropriate and that I'm personally comfortable with in these situations. All I'm saying is this is relevant context that should have been provided, rather than just that selective quote at the beginning. And so, I again want to close with where I started. I encourage you all to go back and read the entire conversation, and it's easy to do.

CHAIR BEACH: Oh.

DR. ULSH: So, to close out extreme conservatism, the discussion that was cited from 2011 dealt with whether high-bounding exposures were sufficiently accurate. And again, 71 millirem is low. It's comparable to natural background, and it's even below the threshold where NRC or DOE requires monitoring. It's consistent with Board precedent. For instance, they recent -- you got -- you all recently accepted 100 milligram bounding dose at Sandia. So, it's just not accurate to say that a dose this low is insufficiently accurate. That is our position. And I'll pause there because I'm sure you want to talk about it.

CHAIR BEACH: Yeah, a couple of things. The Sandia, I believe we were discussing guards, and I believe they didn't spend much time in the area. But that's -- that's all I wanted to say on that.

I had a couple of issues. The issue -- and the first one is the issue with Linde, as Nicole brought up and we've been discussing, it is relative an -- and -- and in this context, an extremely conservative or high value can always be selected that will ensure that any exposure can be bound but is that plausible. And that was the discussion on Linde back in 2011. When -- when that discussion was happening, the SEC was granted for Linde. So, for Linde, the answer was no, if there is insufficient information or dissimilar -- or dissimulate -- dissimilarities between the two time periods in question, that -- that's the question here.

And then on your slide eight, are you referring to the regulatory threshold for monitoring? We are focused on sufficient accuracy of the bounding value. And I don't think EEOICPA -- I don't believe they have a de minimis level.

DR. ULSH: I am referring to the threshold, the regulatory requirement that workers must be monitored. And I'm using that as an example to say that doses that are comparable to natural background and that are even below the reporting threshold -- or I mean the threshold for requiring monitoring. It fits in with the Board's discussion that high doses are a sufficient accuracy concern, but low doses like this are not.

CHAIR BEACH: Well, I think there's some examples of low doses that became SECs also, I think. Let me see, Pantex was one. Oh, there's a couple more. I can't -- they're not right at the top of my mind. I have so

many notes here. I believe you were involved in that one.

DR. ULSH: I was not involved in Pantex, but --

CHAIR BEACH: Oh, you weren't, okay. Oh, no, no, that was -- that was your count -- okay.

DR. ULSH: Linde was --

CHAIR BEACH: But yeah.

DR. ULSH: I'm told Linde was 4.8 rem, not millirem, rem. So, I -- I don't know -- I can't think of other examples where doses this low were the basis for an SEC.

CHAIR BEACH: Yeah, there was actually three of them. I'll have to come up with those. And -- and the -- the -- and going back to twenty -- that -- we are talking 27 years, from 1968 until 1997, where there is no monitoring for the workers; none. And we're using -- or NIOSH is proposing to use samples in 95 that were taking -- taken to remove the NRC license. And -- and remember, they thought they were going to have a weekend job to clean up, and this turned into a several-year project. So, I just don't want to lose sight of the fact that we are talking about workers for a 27-year time period with no dose reconstruction.

DR. ULSH: Okay. I have some thoughts on that, but I see that Tim Taulbee has his hand up.

DR. TAULBEE: Thanks, Brant and Josie. I just want to interject here a little bit, kind of circling back to what Brant's talking about with this conservatism issue. And what he was trying to point out, and has very eloquently pointed out, the discussion in the by the Board previously has been about these high-bounding doses and whether these are sufficiently

accurate. And I just want to make sure everybody's on board with the differences between Linde and Metals and Controls, because we talked about it at the last work group meeting where that dose that was being discussed was five point -- or 4.9 rem per year that would be assigned, and that was part of that discussion as to is this sufficiently accurate. Here, we're talking about 71 millirem per year type of dose, which are very different. And this is why this is such an important point. And as Brant pointed out in that last bullet, below 100 millirem, there is no requirement for monitoring workers in the U.S., no personal monitoring, which is one of the complaints or one of the concerns of this work group has emphasized over and over again, that there is no monitoring data, personal monitoring data, for these workers. And the reason for this is that these doses are low. Okay. That is where we're trying to emphasize or discuss this particular issue. And so, when it comes to, you know, sufficient accuracy, when we're down at these low doses, as Dr. Melius has pointed out, which was the original purpose of that one-line quote that -- that, Josie, you mentioned that you were concerned about, that, you know, we kind of started this by quoting that, that was the context that we were trying to emphasize. And so, I just want to bring this up for all the work group members, you know, go back, look at those transcripts and be thinking about these high doses that we were proposing back then for Linde and how different that is from what we're proposing here for Metals and Controls. Thank you.

CHAIR BEACH: So, Tim, thank you for that. I just have a question. So -- so, you're saying the Act does not permit prejudgments on whether dose is too low for SEC consideration, but high doses equal

plausibility?

DR. TAULBEE: Could you say that again, because I don't think that's what I'm saying?

CHAIR BEACH: Okay. Well, I -- what I'm hearing is -- and correct me if I'm wrong -- but does -- doesn't the Act -- does it permit prejudgments on whether dose is too low for SEC consideration?

DR. TAULBEE: No, it doesn't. But from the context of sufficient accuracy, that is where the Board has discussed this in the past. Okay. And in the context -- they've discussed this in the context of high doses. It has not been discussed in the context of low doses, especially down around this particular range of 71 millirem.

CHAIR BEACH: Well, and I think for me, the problem I'm having is, we are unsure of the doses because of the intrusive work activities --

MEMBER KOTELCHUCK: Yes.

CHAIR BEACH: -- that maintenance workers were performing --

DR. TAULBEE: Okay. That's a --

CHAIR BEACH: -- after we were --

DR. TAULBEE: -- separate issue.

CHAIR BEACH: I guess that's true.

DR. TAULBEE: I hear what you're saying --

CHAIR BEACH: It all combines --

DR. TAULBEE: -- there; that's a separate issue.

CHAIR BEACH: Yeah.

DR. TAULBEE: But from this standpoint of sufficient accuracy, this is something that the Board, to my knowledge, has not weighed in on at the

very low doses from that standpoint. Okay. But with regards to is this applicable to the previous years of operation and so forth, that's a separate issue. That's a separate discussion.

CHAIR BEACH: Okay. And -- and my memory is that we have weighed in. I don't have the information right at hand, but we have awarded SECs in, I believe, three different cases for low doses. But that's -- that's besides the point in this discussion, I believe, or.

MR. MCCLOSKEY: Well, I -- unless this point has been challenged and repudiated before in the previous 10 years or so that I don't know about, we used to talk about the two-prong test. Can I talk about that, Tim or has that been -- or is that out of date?

DR. TAULBEE: No, I know, I just didn't want to go into the health endangerment issue within the context here of the work group. I mean, we could, but the theory --

DR. ULSH: Well, the first prong --

DR. TAULBEE: -- is two prongs --

DR. ULSH: The first prong is that the doses are so -- are high and cannot be bounded. And it -- this fails on that point; they can be bounded. They're not high. I'm not saying that there is de minimis, Josie. I'm not saying that. The second prong is high enough to endanger health, and we could argue about that all day. But 71 millirem is a pretty -- pretty much of a stretch on that point, too.

Okay. That's the end of the extreme conservatism, unless you all want to keep talking about it. All right, moving on. Conservatism of the 95th percentile soil contamination value. We base this bounding scenario on

interviews that were conducted with workers, and SC&A participated in that, and I think the working group did too. And we determined that exposures to contaminated soil near that priority-one drain line pipe where the -- the uranium fuel pin was found, is the bounding scenario. Furthermore, it's also plausible because it's a situation that actually existed at the site. So, it's not some hypothetical scenario that we made up. This is a situation that actually occurred at the site.

Now we've applied it in a conservative way, as is appropriate for a bounding scenario. I think this is the only slide that I have on this, if you want to talk about it.

CHAIR BEACH: Nope, I'm good. Go ahead.

DR. ULSH: Okay.

CHAIR BEACH: Anybody else?

DR. ULSH: You-all are getting tired, I think. Okay. Okay. So, I want to correct a misperception here that if NIOSH participates in this process, and we -- you know, when SC&A, or the working group -- group brings up a scenario, and we engage with you on that, and we show -- we go do an analysis to show that it's not high or it's not bounding or whatever, that that means that we have agreed with it or that we agree that, you know, our previous analyses were insufficient or whatever. That's -- you should not make that interpretation. We are in good faith participating in this process. And if you bring up a concern, we analyze it, without any judgment on -- on, you know, anything about agreeing with it or not.

So, these other scenarios that we evaluated, I think that were, what, six bounding scenarios. Those were developed in discussion with SC&A and

the working group, and we showed -- rather than argue that -- that they're implausible or shouldn't be looked at, we just -- we -- we looked at them. We bounded them.

We still maintain today, and we've maintained in the past, that the soil scenario is bounding, and we've presented our arguments for why that's the case. So, participating in the process does not equal agreement or -- or whatever. It just means that we're participating in good faith, and I just want to make sure that -- that everyone understands where we're coming from on this.

Moving --

MEMBER KOTELCHUCK: Um...

DR. ULSH: Okay. Let me move back if you want to talk about it.

MEMBER KOTELCHUCK: If I may -- if I may, just -- you've made note that there was a fuel rod found in that -- that scenario was based on the emanations from the pipe and that's -- and -- and it had a fuel -- a single fuel rod in there.

DR. ULSH: Correct.

MEMBER KOTELCHUCK: I don't -- but as I read that -- as I was reading about that five or six years ago -- and by the way, this whole, you know, process has been going on a long time. It's hard to remember a lot of things going back. As, as I read the -- as I read the scenario, there was no explanation about how did this happen. How did the fuel rod get into the pipes. And you're saying, well, that's a real situation. Okay, yep, that was real.

But how do we know that there weren't others that were in the pipes,

or that came through or that there was more than one 15 or 20 years before. We can't identify why the fuel rod somehow got into the pipes there. So, I don't -- I don't actually feel like this event had to be the, if you will, the maximum event. It is a real event. There's no question about it. But is it the maximum? Could other fuel rods have gotten through? And I -- I don't under -- or I don't believe that there was an explanation as to how did it ever get there.

DR. ULSH: I do not have an explanation for how the fuel pin got into the drain line. I mean, I could speculate about it, but I don't have evidence to --

MEMBER KOTELCHUCK: Right.

DR. ULSH: -- to answer that question definitively. Again, all I can tell you is they did 100 percent walkover survey, and they detected this particular area because the pin was there, and they did not detect other similar areas like that. That's all I can tell you. It -- I mean, I can't prove a negative here. I can't prove that some kind of a pin -- I don't even know the scenario here, but --

MEMBER KOTELCHUCK: Well, --

DR. ULSH: -- the pin came from the HFIR work, we know that much.

MEMBER KOTELCHUCK: Okay.

DR. ULSH: And -- and it pro -- what we're saying is that the exposure potential that existed was an exposure to the soil around that pin. We didn't find -- they didn't find other similar areas, so this is the bounding scenario as we know it.

MEMBER KOTELCHUCK: So, this is a scenario, as observed?

DR. ULSH: Correct.

MEMBER KOTELCHUCK: But the question is -- and it's -- it's plausible, in that it exists, and that measurement is taken on, you know, an existing situation. But you're also suggesting that that represents implicitly some sort of maximum or some sort of -- it's plausible that that is the worst that could have happened in 27 years or 29, if you want to count the full period, and I don't see why you say that. And I assume by the way that that rod was not stuck there forever, that somehow it passed through or that rods like that would eventually pass through the system.

DR. ULSH: I don't know about that. I can't comment on whether they would be stuck in the pipes. This one was.

MEMBER KOTELCHUCK: It certainly was. But tell me why it represents a maximum or something that is certainly not -- it's certainly not a minimum. Again, it's a real situation, but -- but if I don't know how the fuel rods got in or -- or came from high -- or which ones came from HFIR, how do I know that several didn't occur? I -- I -- a couple of other -- that other -- hey, five, six times might have happened at -- one or two or more.

DR. ULSH: Okay.

MEMBER KOTELCHUCK: I don't know -- I feel like this is -- this is an exercise, and we don't know. That's -- that's the center of the whole eminency issue we've been debating.

DR. ULSH: I'd like to --

CHAIR BEACH: So, --

DR. ULSH: -- take some time to think about my comments. I do see that Tim has his hand up.

MEMBER KOTELCHUCK: Okay.

CHAIR BEACH: Yeah, and I don't know if Tim was gonna say this -- and I'll just quickly say -- that the fuel rods weren't HFIR, I don't believe. I believe those were the Naval reactors, but I don't think we know that for sure that -- I know for sure it wasn't HFIR, though, --

MEMBER KOTELCHUCK: Uh-huh.

CHAIR BEACH: -- based on past comments from petitioners. Tim, I'm done. Tim, go ahead.

DR. TAULBEE: I don't know the answer to that question either there, Josie, the fuel pins versus the -- you know, whether it was HFIR or Naval -- Naval fuel. But the point that I wanted to bring up here to answer Dr. Kotelchuck's concern about, you know, did this happen before, or, you know, five, six times, seven, eight, whatever, you got to look at our model as to what we -- what we've done here. We have taken all of the soil data, and we're taking the 95th percentile, which includes that fuel pin. And then we're assuming an exposure to that every year that that worker worked there. So, it's not just that we're assuming oh, this was a one-time thing. We're assuming that over this entire residual time period, that every time they went in, that they -- the 95th percentile would be encountered from that, and that fuel pin is part of that distribution of that soil data.

Okay. So, we're not making any assumptions about how often. We're basically saying every year, if somebody was doing this type of work, then they would be part -- or they could have encountered one of these fuel pins. All right. Does that make sense, sir?

MEMBER KOTELCHUCK: It does make sense that -- that you did it,

and it's -- the pins -- the pin and the work that you did on the subsurface soil area is one element of source. And but -- but there -- we are -- I mean, the argument now is that there are -- there were other sources from the rough-and-ready work that maintenance workers do. We talked about some scale, coagulant, sawing, cutting. And we don't -- we don't know what this -- what this contributes. The piece -- the piece that you have talked about in the subsurface area, I agree.

I mean, that -- that -- whether -- whether -- if it's not the maximum or if it's -- or if it was frequent, or -- or a couple of times it happened, situations where it occurred a couple of times or a couple of rods -- whether saying okay, suppose that happened every day, which is absolutely -- you know, for 30 years, which is at one level unrealistic, but it certainly is an exaggerated -- it's an exaggeration of that subsurface -- the impact of that particular subsurface model. That may not be the whole source of -- and that -- that is part of what we're arguing. It may not be the whole source of exposure to the workers.

And -- and by the way, the -- the -- the exposure that people get has to be translated into a dose to the worker and that -- the workers were not using any -- using proper methodology, if you will or not -- they were not -- they were not exit -- using a good -- industrial hygiene practices, keeping their distance, keeping they're -- keeping their -- their -- spending as little time as they can in that area, all of the things that people do when they think they're dealing with radioactive material. And those folks didn't think they were.

DR. TAULBEE: Right. And we --

MEMBER KOTELCHUCK: So, it's -- it's --

DR. TAULBEE: -- understand this --

MEMBER KOTELCHUCK: -- part of the story.

DR. TAULBEE: We understand that, sir. But we're not taking into account any of those things in our exposure model. And we're assuming that, you know, every year they were exposed in this scenario, okay. So, from this -- this model that we've got, that's where we talk to the workers, how often did you go in and did you excavate these pipes, did you go in to do this type of work. And that is part of our annual exposure that we use to come up with this totals to 71 millirem. This is just one piece of it. But we assume this every year. Okay. So, it wasn't just a one off. So, throughout their entire time period, from the time operations shut down until through the end of the residual period, we're giving credit for this every year.

MEMBER KOTELCHUCK: Well, you know, there -- you -- you're not able to or don't take into account the awful work practices that were being used and the poor industrial hygiene practices, the lack of training. That doesn't -- it doesn't come in. And I noted somewhere where folks said -- you said well, we don't use this, and it doesn't determine what the source is. And of course, that's true.

But the dose -- the dose to the worker has to get translated through the means of -- of -- in which they operated and the instrumentation, which they used to get -- and I -- and I would say, I -- the -- the folks who -- from the claimants -- the claimants have talked time and again about the rough-and-ready work that they did. The lack of -- of attention to protecting them from exposure. And I -- I'm left -- well, I'm left with feeling that we have no

measurements on individual claimants. Coming back to what we said. No training, no work activities, and no taking into account the poor work practices.

DR. TAULBEE: So, I'd like --

MEMBER KOTELCHUCK: NIOSH --

CHAIR BEACH: Dave, thanks. Thanks, Dave.

MEMBER KOTELCHUCK: Okay.

CHAIR BEACH: I -- I wanted to make one comment. I know, Tim, you were going to comment again. But on your previous slide, the 95th percentile, that does not include the fuel rod. That is just the soil surrounding the fuel rod; is that correct?

DR. TAULBEE: That is correct.

CHAIR BEACH: And there is no correlation between the contaminated soils around the fuel rod and the fuel rod itself.

DR. TAULBEE: That is not quite correct. The highest soil concentration was found directly where the fuel rod was inside the pipe.

MEMBER KOTELCHUCK: Uh-huh.

CHAIR BEACH: Inside the pipe, okay. Thanks.

DR. TAULBEE: I might have --

CHAIR BEACH: Tim, did you want to say anything before we move on? Let's get through NIOSH's slides.

DR. TAULBEE: No. Brant covered it. The highest soil samples were around where that fuel pin was, so this is why we also consider this to be the bounding scenario. And again, applying it not just once, but every year.

CHAIR BEACH: And it can remind me how that soil sample was taken?

I -- I mean, was it just a meter?

DR. TAULBEE: Pat -- I don't know. Let me -- Pat, do you know the sampling method?

MR. MCCLOSKEY: Sure, Brant (sic). It's also described in that same subsurface characterization document performed in 1995. They talk about how they decided where to sample. They had a sample and analysis plan. They have chain of custody information for all the samples, but they -- they went in and -- with surveying instruments, identified high RAD levels, and collected an actual physical amount of soil, put it into a sample dish, and sent it off to Oak Ridge for analysis. We could read that to the work group in this meeting so --

CHAIR BEACH: No, no, that's --

MR. MCCLOSKEY: -- on the record --

CHAIR BEACH: -- okay.

MR. MCCLOSKEY: -- but --

CHAIR BEACH: No, that's okay.

MR. MCCLOSKEY: -- before Josie.

CHAIR BEACH: That's okay. I remember reading that. I was just -- didn't remember at this point. So, Brant, why don't you go ahead and finish up?

DR. ULSH: Yes. Put a big --

CHAIR BEACH: -- at the end.

DR. ULSH: So, to put a bow on this, as Tim described, we're assuming this every year. So essentially, it's the same as assuming not one fuel pin, but 27 fuel pins, one per year, every 27 years. And, yes, we agree that the

work practices -- well, we're not rendering any judgment about work practices. We're not taking any credit for training. We're not taking any credit for respiratory protection, engineering, administrative controls. We're not taking credit for any of that.

This is a source-term model where we're making worst-case assumptions here. And I think if we -- if we assigned a much higher dose based on hypothetical scenarios that we can't back up, then I think that would make us vulnerable to being insufficiently accurate. So, this is one that we feel comfortable saying that it is both plausible and bounding.

So, to wrap this up, nothing new here. For the green lube issue, we don't find any evidence of a concentration mechanism. And it's -- it's just not plausible. The interior pipe contamination and scale, this was data that was requested by the working group, and we provided it. Our position is still that the soil scenario is bounding. Confined spaces, our position, at least, is that this is not an issue with radioactive material at Metals and Controls. At worst, it's a TBD issue. Our position is it's not even that, but we will engage in the conversation in a TBD framework if the working group wants to. Dust loading, we agree with SC&A position in 2021, that the value itself is appropriate. We agree that the NUREG is a more compelling citation to support it. And that's our position.

In terms of intrusive activity, it is our contention that what we're proposing here is similar to what has been done and approved at several other sites that have been accepted by the Board. Data applicability, again, the '95 survey is from the end of the maintenance period, and it was back-extrapolated to the rest of the maintenance period. And it was meant to

bound doses for ongoing maintenance work to nonradiological workers. And we say that that make -- that is directly relevant. Not identical; we're not claiming that. We're saying is directly relevant.

In terms of extreme conservatism, we are consistent with 20 years of program precedent here. Sufficient accuracy becomes an issue if we are proposing a very high bounding dose. We are not. And the conservatism of the 95th percentile sediment value really, it includes hot spots, it is biased high, and it also includes content contributions from noncovered contaminants, and that makes it even more conservative.

Let me see, is that it? No. How do I get rid of that? Let's see. There.

So, in closing, it's not clear to me what the concern here is. Is it that the bounding dose is -- is too high to be sufficiently accurate, or is it not high enough to be bounding? It seems like we're damned if we do and damned if we don't here. We've addressed every issue that's been raised by SC&A and the working group. I'm not claiming that you all agree with us, but we have addressed them all. Our positions today are the same as they were in July, and that is that we can bound the dose with sufficient accuracy. Excuse me. And no new evidence has been presented to change our position on that. So, that, I think, is the end finally for me.

CHAIR BEACH: Okay. Thank you. I don't know that you answered some of our questions completely, which led to a lot of discussion today. One that comes up is coagulants, scale. Those are still loose, but I don't want to get back into that discussion now. I'm sure we will moving forward. Any other comments or questions for Brant?

Hearing none, Rashaun I would like to propose a break until 10:30

before we get into SC&A's discussions.

DR. ROBERTS: Sure, does that seem sufficient to other people in the work group?

MEMBER KOTELCHUCK: Yes.

DR. ROBERTS: Okay.

MEMBER MARTINEZ: Is that 20 minutes from now?

CHAIR BEACH: Yeah, well --

MEMBER MARTINEZ: Okay. Great.

CHAIR BEACH: -- 10:30 my time, so --

MEMBER MARTINEZ: Great.

CHAIR BEACH: -- 1:30 your time.

MEMBER MARTINEZ: Thank you.

CHAIR BEACH: Unless -- unless others need lunchtime. I'm not opposed to that, but --

MEMBER MARTINEZ: That works for me.

CHAIR BEACH: Okay. Thank you.

MEMBER KOTELCHUCK: Works for me.

CHAIR BEACH: Great, Dave. Andy and Loretta, you guys okay with that?

MEMBER ANDERSON: Sure.

MEMBER KOTELCHUCK: Okay. Good.

CHAIR BEACH: Okay. Until, I guess, 1:30 your time?

DR. ROBERTS: Yes, correct.

CHAIR BEACH: All right. See you back.

(Whereupon, a break was taken from 1:11 p.m. EST until 1:30 p.m.

EST.)

DR. ROBERTS: Okay. I do have 1:30 Eastern, so I'll go ahead and do a quick roll call. Beach, are you back?

CHAIR BEACH: I'm back. Thanks

DR. ROBERTS: Okay. Anderson?

MEMBER ANDERSON: I'm here.

DR. ROBERTS: Kotelchuck?

MEMBER KOTELCHUCK: Here.

DR. ROBERTS: Martinez?

MEMBER MARTINEZ: I'm here.

DR. ROBERTS: And Valerio?

MEMBER VALERIO: I'm here.

DR. ROBERTS: Okay, great. Okay. Over to you, Josie.

CHAIR BEACH: Thank you. Do we have any unfinished comments or business before NIOSH -- Before SC&A starts?

MEMBER MARTINEZ: Hey, Josie, just a just a clarification -- if you'd like to go through this presentation the same way where we can kind of ask questions in the middle, or if you want us to, like, power through and save our questions to the end?

CHAIR BEACH: I think we should go ahead and ask questions throughout --

MEMBER MARTINEZ: Okay.

CHAIR BEACH: -- and maybe not slide by slide, but --

MEMBER MARTINEZ: Okay.

CHAIR BEACH: -- yeah, so -- so, yeah. I think we should proceed the

same way.

MEMBER MARTINEZ: Okay.

CHAIR BEACH: Thank you.

MEMBER MARTINEZ: Thank you.

CHAIR BEACH: Okay. Joe, are you ready?

MR. FITZGERALD: I'm ready. Can you hear me all right?

CHAIR BEACH: Yes, I can.

SC&A's Review of Overall NIOSH Response and SEC Issues Under Consideration

MR. FITZGERALD: Okay. Good afternoon. I'm going to go ahead and give you a review of -- of our response to NIOSH's review from last August. Unlike Brant's, this review -- I should say that these slides were put together a week or two ago and respond specifically to that report. So, I'm going to try to cover some of the -- and I realize Brant did indicate that nothing was new, but there were some, certainly, novel comments -- comments or interpretations, which were not in the written report that we reviewed in August that I'll try to address as I go and, you know, work group members as -- as we go along, obviously, if there's any items that were raised before that I do not raise, we can cover those as we go through the slides. And my erstwhile partner, Bob, is going to move the slides.

Bob? There we go.

And you've seen this before. I'm not going to dwell on it. Just the -- the sequence since last March, as to chronology. Okay.

I'm going to spend a little time on this, because I think it's been a

while. This is the findings and observations that came out of the supplemental review that the -- this work group requested last -- last year. And I think it's helpful just to make sure we fix on the wording of the -- the two findings that we did make. Finding one. I want to emphasize that the -- what we found was the back-application of a high 1995 sediment survey results to bound the inside subsurface activities is not adequately supported by information. Okay. That's the key part of this. Is not adequately supported by information for the M&C worker activities from the earlier residual period. So, we're talking about the entirety of the residual period and whether there's sufficient information to inform the -- the application of this 1995 data to -- to cover those processes and conditions in the 27 years that we keep talking about.

Finding two, and we -- we spent -- certainly Brant led a discussion with the work group on that. But I want to be very clear that the finding was very specific. What we had -- you know, we were certainly, obviously, aware of all the SC&A reviews and analyses and did not disagree with, certainly, the -- the technical analyses that were done. But what we felt was a problem was the use of the Mound project data as surrogate data to derive the dust-loading factor. And the reason, of course, is that we thought there were confined spaces at M&C that weren't encompassed by the way the sampling was done on the Mound -- the Mound study project. And that was -- that was very specific. And again we, from the -- the start, as you recall, the supplement review, we even provided some references to both national, international resuspension factors, what have you, that others have applied to model confined spaces. So, you know, very much from the get-

go, we believe this was a -- I think the term is tractable issue, and one that, obviously, wasn't an SEC issue. But certainly, we felt it didn't meet the surrogate data policy that the Board has -- has put in place, because we felt that the lack of confined space consideration on the Mound study data was a source of -- of nonequivalency, if that's a word, between the Mound site and M&C. So, that was the -- those were the only two findings that came out of our review. I'll go into the observations, but that's essentially it. And finding two, as was previously discussed, is, from our standpoint, from the very start, had the -- had the, you know, reflections of what could be a TBD issue.

Next slide, please.

And, you know, we -- we -- we -- we have spent a great deal of time on what, to me is -- is probably a more subjective topic, which is how intrusive is intrusive. We have compiled tables. We have, you know, provided descriptions. But I think in -- in -- in the analysis, we felt that, given the circumstances at M&C -- I'm talking about the M&C maintenance folks -- workers being very much involved with closed-in excavations, pipe cleaning, cutting, and, of course, we -- we identify confined spaces. And -- and also, -- and during the residual period, there were certainly some questions revolving around the presence of sediments, scale, coagulants, and repurposed machinery and equipment. And that's just a short list.

But certainly, there were -- it was a level of intrusive activities that went beyond what, you know, we might find at a more typical AWE that had, basically, residual uranium that was resuspended just by, perhaps, workers moving it about the space. So, this was a level of intrusiveness that we felt

ought to be recognized. And, of course, that's why we did include table one in our review. And, of course, NIOSH has now supplemented that with their -- I think it's table two in their response.

But it all comes down to -- I think there's a certain level of agreement, frankly, on the fact that there were intrusive activities at M&C; it's just the degree that we may differ on. But I think there's no question that we're talking about a fairly -- a good level of inclusiveness in terms of work at M&C by the M&C maintenance workers.

And I want to -- and the last bullet, actually, I'm not sure it's the last bullet. It's the right-hand second bullet, but, you know, I don't have any disagreement that the levels -- the dose levels at M&C are relatively low. I personally worked at -- on the Pantex SEC review. I personally worked on the Sandia SEC review. So, I'm very familiar with issues that revolve around relatively low levels of -- of dose in terms of work activities.

And typically, like with Pantex, we're dealing with depleted uranium. So, we're dealing with a relatively low-level source term there. Sandia was sealed sources, and Blockson was, of course, uranium. I believe it was uranium ore being processed. So, there is a precedent for dealing with relatively low-dose levels. But all three of those were subject to an SEC recommendation, and which was -- was accepted, primarily because of the commonality. The common issue was lack of -- of sufficient information to inform source term or to inform exposure, pathways to inform monitoring. In other words, lack of monitoring records. So, that was the commonality between those sites, not the fact that they were a low-level dose, but because the information itself is insufficient to base a feasible dose

reconstruction on. So, I just want to make sure that's clear.

And those -- Josie, those are the three sites I think you were looking for. But again, just examples. We've been there before, and certainly have dealt with relatively low-level source terms. And the issue still comes down to whether there's a -- sufficiently accurate information that can, in fact, support a feasible dose reconstruction or a bounding analysis, if that's the case.

Okay. Let's go to coagulants. A lot of discussion on coagulants. I just want to emphasize, you know, that SC&A did not invent this issue, did not speculate and say, you know, there might have been a coagulant. Actually, this was something that was identified by a former worker. For those who want to review the actual interview notes, it's SRDB-169938. Okay. And this work who was --

MEMBER MARTINEZ: Joe, I -- I'm sorry, could you repeat that -- the --

MR. FITZGERALD: Oh. I'm sorry.

MEMBER MARTINEZ: -- the series of letters and numbers you said?

MR. FITZGERALD: The SRDB number for that interview, so you can actually read it first-hand, --

MEMBER MARTINEZ: Yeah.

MR. FITZGERALD: -- 169938.

MEMBER MARTINEZ: 161?

MR. FITZGERALD: No. 1691 --

MEMBER MARTINEZ: 169.

MR. FITZGERALD: 169938.

MEMBER MARTINEZ: Okay. I got it. Thank you.

MEMBER KOTELCHUCK: By the way, Joe. Joe, do you happen to have the number -- I'll -- I'll try to look at the -- re-look it up again. But I -- they were numbered in the -- in the interview.

MR. FITZGERALD: Yes, I --

MEMBER KOTELCHUCK: Do you have the number?

MR. FITZGERALD: I have the number, but I'm a little reticent about getting into specific identifiers.

MEMBER KOTELCHUCK: Okay. All right.

MR. FITZGERALD: I -- I -- I can get that to you privately. I do have --

MEMBER KOTELCHUCK: Yes, please do.

MR. FITZGERALD: --have the worker -- the worker -- the worker number.

MEMBER KOTELCHUCK: Thank you very much.

CHAIR BEACH: Yeah. And Joe, just to clarify, most of us have all the interview notes. We just didn't get them through the SRDB recently.

MR. FITZGERALD: Okay.

CHAIR BEACH: Yeah, and we've --

MEMBER KOTELCHUCK: (Indiscernible) --

CHAIR BEACH: -- had them since 2017.

MR. FITZGERALD: Yeah. I'll pass -- I'll pass that along.

But there was a little bit of -- I thought there was a little bit of ambiguity of where this issue came from. It came from an interview, and it was someone who was fairly knowledgeable about the wire department. And

he -- he -- they -- the comment was, there was a vegetable based mineral oil that was used in building 10 for drawing wire and, you know, had the properties of a coagulant.

And -- and basically, the message was that that would go down the drain and they would it would frequently plug up -- plug them up. It would plug up the drum -- drainage. And that was the -- that was the source of, you know, the question of a -- of a routinely released coagulant, oil-based coagulant getting into the drain system of building 10. And the only issue that we've raised, and this is our question, is during the act of building 10 operations -- and this would've been through to the early '80s -- with the -- would the regular release of such a coagulant have led to more frequent and substantial blockages, including elevating uranium and thorium as a function of the consolidation properties of the coagulant oil on sediments. Okay.

That was the question that we raised in the supplemental review. And I want to make it clear we're not asserting it happened. We're -- we're raising the question that given the presence -- regular presence of these coagulants and the fact that they, in fact, were attributed as plugging up the drains, is there any issue that needs to be addressed in terms of whether the uranium and thorium that would have been present in the pipes, whether that -- that oil-based coagulant would have had the properties to consolidate. And later on, I think we did use the word concentrate.

But more in -- from the standpoint of a question in terms of the sediments that were there. And the reason we raised this is that these coagulants, you know, weren't being discharged in 1995. They were being discharged in the 1970s into the early '80s. And this is a -- and -- and from

our standpoint, a fairly significant difference between the -- and I'm not going to use that era term -- between the post-1995 period and the 27 years before that.

Certainly, I would argue that the conditions and processes in the drainpipes of building 10 were markedly different with the regular discharge of this coagulant, which apparently was plugging up those drains on a regular basis. So, the question is, would that have perturbed the source term that was identified in 1995 in any way that would raise some doubts about whether you could apply that back to that time frame. That's the essence of the question. Okay. And I'll get into the specifics. I guess, the next slide, in fact. Let me --

MEMBER MARTINEZ: Joe, can I -- can I --

MR. FITZGERALD: Yeah.

MEMBER MARTINEZ: -- ask a question on that?

MR. FITZGERALD: Yeah.

MEMBER MARTINEZ: Can you remind me what AWE stands for?

MR. FITZGERALD: Atomic --

MEMBER MARTINEZ: In the --

MR. FITZGERALD: Atomic -- let me see. Maybe somebody will help me. Atomic weapons --

DR. TAULBEE: Atomic weapons employer.

(Whereupon, multiple members and participants spoke simultaneously.)

MR. FITZGERALD: Atomic weapons and -- and establishment or employer or something like that.

MEMBER MARTINEZ: Okay.

MR. FITZGERALD: Okay. AWE.

MEMBER MARTINEZ: And then the other -- I have a more general question, and I don't --

MR. FITZGERALD: Yeah.

MEMBER MARTINEZ: -- know if this is something you would know, but it seems like everything is going down the drain. Like, there is a -- I can't even imagine how a fuel pin winds up and a pipe. But do we have other information about other stuff that might be in the drain? So, we have this oil, we have potentially uranium and thorium, one random fuel pin. Is there any other information about what was being washed down the drain?

MR. FITZGERALD: The only I saw -- and I -- I'd have to go back and track it down -- but there was an interview where the worker was saying just about everything went down the drain, meaning that in the -- in the operating floor area, you had these drains. And whether it was small items, pieces of whatever, or just simply dirt and rags or whatever, that they tended to go into the drain. So, that's the only reference I saw. I don't think there's was any -- anything that was reported, that -- that -- other than the fact that you had drain -- you had drainpipes and you had -- well, I'm sorry. You had pipes that -- that were draining the floor and pipe says that were draining the roof. And that's -- that's pretty much what, what -- what the network was made out of.

MEMBER MARTINEZ: Okay, thank you.

MR. FITZGERALD: Okay. So, anyway, again, I'm going to adhere specifically to what was in the NIOSH August report, because, I -- again, I --

I only saw Brant's slides last night, so I certainly didn't have a chance to adapt any of this. But I'm gonna just go ahead and address what was said in the report.

And what NIOSH said as far as coagulants, was that they're going to treat it as a TBD issue, and they will, in fact, identified locations of the wire machines and building 10 and see where perhaps the coagulants would have drained to as far as what pipe lines and -- and as the see if, in fact -- what was downstream of the -- the wire machines, which were the purported source of the coagulant. So, that was the -- the updating. And I think they -- again, they also wanted to throw in some considerations that they felt were important. And the three considerations, I'll call them, where Weston could have noted and collected coagulant when they characterize the drain lines. So, you know, that would have been something that would have been picked up and analyzed in any case.

The second one was that they -- and this was -- I think, Brant did mention this -- that they -- they believe the airborne hazards associated with cleaning the clogged pipes would be minimal, because the clogged material would be wet and that because coagulants functioned as a glue, that would reduce resuspension and respirability of the source term.

And I think the third item that -- again, was listed was that there was -- there was just no information in the literature that would support what would be considered the solvent properties of this lube oil, if you want to call it that, that made up the coagulant. And this goes to the question of if there were fixed deposits of contamination inside the pipe, the -- the lube solution or whatever would need to have some solvent properties in order to perhaps

dissolve and resuspend any of the -- any of this uranium or thorium. So, the question of the solvent properties of the lube. And -- and -- and certainly, the bottom line, which is reiterated today, was at NIOSH felt it could abound exposures and -- and while accounting for the effects of the coagulant released to the drain line.

And -- and our response, and this was -- and this -- this is actually detailed in the report that was issued, I guess it's about, a week to 10 days ago -- maybe a week. And we specifically went through all that. And first -- the first item was this question of -- and we didn't address the, you know -- what -- what NIOSH was planning to do in the context of a TBD review. That certainly is their business, but we wanted to address some of the considerations that they did highlight as part of their response.

And the first item was whether or not Weston would have identified and collected -- collected coagulant during characterization. We felt that just, you know, didn't make any sense because it doesn't comport with the coagulant mechanism. And this is one reason we spent perhaps more time than we should have just kind of describing what the coagulant mechanism is. And we wanted to make it clear that this is how coagulation works. And here's what the implications would be for any sediments that were in the pipe. And just -- and to provide some examples and references on that process or mechanism. It was not, frankly, to assert that the process -- the coagulation process at M&C was identical or similar to wastewater or drinking water treatment; not at all. Okay. This was simply to illustrate the coagulant mechanism, the process itself. Because there's a -- we were concerned about misinterpretation or misunderstanding of what -- you know,

what we meant by coagulation. And I think the first bullet, maybe, underscores the importance of why we need to do that. Because I think it's pretty clear that the -- you know, these are substances and it isn't a specific chemical, it isn't a specific buffer agent, in term -- these are substances that serve to neutralize normally repulsive electrical charge of sediments. Okay. This -- the -- the particles, you know, in solution or whatever, tend to repel each other, and the coagulant permits them to consolidate, forming flock. Coagulants are not sticky. They do not function as glue, which was sort of the description that was in the response from August. And we have no idea what the solvent properties of the lube coagulant was. We don't even have any specs on that lube, and it would be impossible at this point to know, you know, whether or not they had that -- that coagulant had solvent properties as well. It may have; we just don't know.

So, what do we know? What we know is during the M&C residual period, drainpipes contained in -- in -- and this is by degree. We don't know if it was more or less, but both in-solution suspended sediments and fixed-sediment contamination of varying degrees -- that's why we say of varying degrees -- for which regular introduction of oil-based coagulant was known by M&C workers to cause the blockage of drainpipes requiring clean out.

And then, you know, I want to talk about the -- you know, I made it clear that we were focusing on uncertainties. And the reason we were focused on uncertainties, because there's no data from that time period that would actually clarify, you know, the degree, for example, which the residual uranium and thorium was in solution or in a fixed clump of contamination on the side of the pipe. We don't know and NIOSH doesn't know. Okay. There

weren't any specific analyses done back in the '70s and '80s that would give us specific information on -- on what that might have been. But certainly, there would have been likely suspended sediments and fixed contamination of whatever varying degree, and -- and these, in fact, caused the blockage of the drainpipes.

So, our -- yeah. So, our conclusion does, in fact, raise the question of whether or not this block -- this coagulant oil may have led -- okay. We don't know. There's no evidence, and there's no information that would help us at this point. But what this coagulant oil have led to increased concentrations of uranium and thorium contaminated sediments, which -- for which the upper-bound exposure estimates may not be feasible. So, in essence, it's uncertainty from our standpoint, and there's no information that we can find that would -- would lead us to a conclusion one way or the other.

Okay. So, moving on --

CHAIR BEACH: Joe, be --

MR. FITZGERALD: Oh, go ahead.

CHAIR BEACH: Joe, Joe, before you move on. Any comments or questions for Joe on the coagulants before we move on to the next topic? All right. And I think, going forward, if you have a question, just jump in and --

MEMBER ANDERSON: Joe, Josie, --

CHAIR BEACH: Oh, go --

MEMBER ANDERSON: -- just ask --

CHAIR BEACH: -- ahead, Andy.

MEMBER ANDERSON: -- Joe, the -- this -- these were chemicals or the -- used with the wire production, was that throughout the whole period from the '70s on?

MR. FITZGERALD: It was only during the operations of building 10. They had a wire machine in building 10 that used the oil -- lube oil, whatever you -- green lube, whatever the term is, as a means to lubricate the wiring operation. So, once building 10 ceased operation and the wire operation ceased, there would not have been any more introduction of the --

MEMBER ANDERSON: When was that?

MR. FITZGERALD: Nineteen eighty --

MEMBER ANDERSON: Do you know what --

MR. FITZGERALD: -- one.

MEMBER ANDERSON: '81?

MR. FITZGERALD: 1981, yeah.

MEMBER ANDERSON: Okay.

MR. FITZGERALD: So, we're talking about perhaps the earlier part of the --of the time period.

MEMBER ANDERSON: Okay.

MR. FITZGERALD: -- residual period.

MEMBER ANDERSON: Yeah.

CHAIR BEACH: Thanks. So, I'm not gonna interrupt Joe every time. If anybody has a comment, just please speak up and go ahead and ask it.

MR. FITZGERALD: The -- the only thing I would mention, if you go back to that last -- okay. I know in -- in Brant's closing conclusions, he did say that this issue of coagulants, it just isn't -- it wasn't -- it just isn't

plausible. And -- and -- and my problem with that assertion is -- it's probably the same as he has conversely -- is that I don't think there's enough evidence or information to make that conclusion either way. I just think it's an uncertainty. Okay. It's an uncertainty. And we that's why we posed it as a question in the original supplemental review, that, you know, is there a likelihood that the coagulants in this particular case in this particular circumstance, could they have, in fact, consolidated and concentrated uranium and thorium that -- in terms of the contaminated sediments or not. And we still feel there's just no good information on that. And the fact that they figured in the very clogs that the workers had to cut pipes and remove, I think, makes this a more significant issue than perhaps other issues like this.

MEMBER MARTINEZ: Joe, can I ask a follow up question on that?

MR. FITZGERALD: Yeah.

MEMBER MARTINEZ: That made me think. So, the, kind of, presumption or potential premise underlying this question would be a -- like, a clog causing, like, a physical block and then the, kind of, accumulation of sediments as opposed to, like, the coagulant interacts, like, chemically with the uranium and thorium to change its oxidation state and solubility to release into the water. So, it's more the physical side and less the chemical side?

MR. FITZGERALD: I -- I think it's a combination. I think you're -- you're talking about a coagulant that has -- and I did provide some -- a little bit of background in the report. But the properties of a coagulant would, in fact, reduce this natural, you know, electrical repellency so that sediments

that are suspended would, in fact, consolidate and -- you know, consolidate also implies concentration, because you're really causing sediments to pack together, and they would come out of solution and be deposited.

The -- the only thing that we have in terms of the accounts of the workers is that when this lube went into the system, they would, in fact, see a blockage, a clog, that they would have to go down and clean out. So, there was a one-to-one relationship.

The dynamics of to what extent the coagulant in this particular case -- and we just don't have any information on the coagulant. But the extent to which that would have consolidated and perhaps concentrated the sediments, we don't have any specifics on that. But the -- it's an obvious question to raise given the fact that was a regular release, and it was tied to the clogging, the very clogging that the -- the maintenance workers had to, in fact, cut pipes for and actually extract clogs.

So, that's -- that's the reason we felt that -- even though this information had been available since 2017, we just felt it was just too big a question just to leave unaddressed. And we wanted to raise it as a question in terms of the uncertainty of applying a 1995 source term, whether or not that would be too much of an uncertainty that would -- would raise doubts about that.

So, I understand NIOSH's reticence on this, because it's not evidence based beyond the fact that it was released and it caused clogs. Anything about the dynamics of the coagulation process itself, we can only use, you know, what references we can find. But it's pretty clear that sediments were consolidated and -- and possibly concentrated. But can I prove that; no.

There's just no information. This is an uncertainty that -- that we're raising as a question.

Okay. There we go. Enough -- enough on coagulants. (Indiscernible) talk about the aerosolization of contaminated scale. And in this particular case, you know, what was identified in the exposure assessments and the dialogue with this work group was that, in fact, there had been a reading of 1 million dpm 100 centimeters squared. And this was found in a four-inch clay main-line drainpipe that was being cut and removed. And I, you know -- if you read the transcripts of that exchange, I think the work group was, you know, certainly understandably taken aback by the number. I mean, it's just a number. It didn't have any context or anything. But certainly, questions were asked about what does that mean, and the fact -- and this is where the term scale first came into place. And it was identified as surface contamination on the inside the pipe. And in the -- and that was pretty much where it was left. In our supplemental review, though, we wanted to examine that issue a bit more, because, again, in the exposure assessments that -- in the evaluation report itself, the -- the source term or the -- the -- the source of exposure had been identified as sediments and scale. Those were the two contaminants that were identified in drainage pipes, in priority-one drainpipes. And so, the question that we had was, certainly the sediment survey results were -- were used as the basis for the bounding concentration value that we're all familiar with. The -- this is the subsurface inside modeling. But we didn't see much more on scale, despite what's, in our view, was a pretty salient measurement, the 1 million dpm.

And so, the question in our mind was during the M&C residual period,

yeah, obviously, the drainpipes were cut, repaired, replaced, cleaned out, and that, you know, there was a range of power tools used. And, you know, this went anywhere from saws, drills, grinders, and power -- powered snakes, and also cutting torches. And this, I guess, there was some question about cutting torches. And I'm going to defer to Mr. Elliot when he gives his -- his presentation later. But we did get confirmation from him in an earlier inquiry from the work group that, in fact, cutting torches were used at M&C. Not as frequently as snap cutters. I mean, you certainly didn't need a cutting torch every day, but they were used.

But I think in -- in general, our concern was that the -- the exposure pathway that is presented by cutting a pipe that contained scale didn't seem to be addressed anywhere that we could find. It just wasn't part of the exposure pathway analyses that had been generated up until then. And what we did in the supplement review is just frank -- frankly, just highlight the fact that in another AWE assessment -- this one was a DOE hazard assessment at Bridgeport -- Bridgeport Brass.

They, in fact, had identified that you could have residual uranium released by intrusive work activities such as pipe cutting and removal. It wasn't intrusive work activities with a torch; it was intrusive worked activities in terms of pipe cutting and removal and that in -- in certain conditions, and they highlighted the cutting a steel pipe with a cutting torch as one example, surface activity attached to the steel could be released. And, again, the bottom line is that we felt this was an exposure pathway that could involve the fairly fine fumes and particulates, depending on the actual work activity involved. And it was a -- a legitimate exposure pathway

that needed to be addressed.

Next one.

MR. BARTON: Joe, this is Bob. Just before you go on, I just wanted to correct one slight inaccuracy. It's -- it says exceeding the 1 million dpm, but that was --

MR. FITZGERALD: Oh, I -- yes.

MR. BARTON: Yeah, if you -- you want to explain it, but you --

MR. FITZGERALD: -- high as.

MR. BARTON: As high as.

MR. FITZGERALD: I will slap my knuckles.

Okay. Next one, please, or is that the next one? That is the next one, okay.

The NIOSH response in the August report -- and you can read it as fast as I can say it -- but clearly, snap cutting and sawing was more routine than torch cutting. We agree. NIOSH did not select cutting of drain lines as a balancing scenario for M&C. We agree. That was pretty clear. But what we are saying is it wasn't even assessed as an exposure pathway either.

At any rate, with our highlighting this exposure pathway, NIOSH did review the DOE's exposure assessment and examine the -- the modeling that they did and -- and -- and -- and again found that the -- the ratio of assigned doses as the source term and, in fact, compared favorably with M&C, the one that was done for Bridgeport Brass. And furthermore, that there was a comment, which -- I kind of scratched my head a little bit, but okay -- at this late date, NIOSH was indicating that the 1 million dpm per 100 centimeter square was not actually for, quote, scale but was for interior

pipe service contamination, and that it was for a clay pipe, not a cast iron pipe. And I think the conclusion that they advanced was that, oh, by the way, scale and rust are not associated with cast iron pipes.

The next I -- next response was -- you know, this was in response to our concern over whether, in fact, a contaminated scale in the pipe system might be a more systemic source term, and not just a simply isolated one. I think NIOSH's response is that -- and I think Brant actually underscored this -- it relies on the available source term data that was part of the comprehensive survey that was done by Weston and Texas Instruments. And from those surveys -- because we -- we -- we kind of asked the question, or at least posted it in the last work group meeting and perhaps in our other reports, that we were certainly familiar with the 1 million dpm per 100 centimeters squared value, but we didn't see any other measurements for scale. And, you know, the -- the question that we had was, you know, how -- you know, how significant is the contaminated scale issue? And was in fact, 1 million dpm, was that the -- the high end or is that typical or, you know, maybe there was higher. We -- you know, I just -- we didn't see any other data. And so, in a case, as part of their response, NIOSH provided pretty much -- I -- I thought it was a pretty extensive listing of what they felt was the -- the scale data that they had on hand.

And finally, NIOSH performed the dose assessment based on the source term calculation model that was provided in the Bridgeport Brass hazard assessment and using the 1 million dpm per 100 -- that should be 100 centimeters squared measurement as the source in that equation. And -- and in our response which was our paper, again, that was issued last

week, we wanted to reemphasize that, you know, the M&C workers used a wide array of power tools to cut and clean out pipes. And no, they didn't use a torch to do all that, nor did they just simply use cutters to do all that. It was a range of mechanized tools, and all of which had varying degrees of volatile -- volatizing and suspending of fine particles and, you know. The highlighting of the Bridgeport Brass AWE hazard assessment, we did that just to, again, emphasize that this was a legitimate exposure pathway and that -- that certainly cutting pipes with a torch or other means could, in fact, give you -- or give the worker involved exposure to that scale.

The -- the issue of using the Bridgeport Brass modeling parameters as a basis for evaluating the M&C exposure, I think, we -- we -- we felt that was a bit of a problem because, again, with Bridgeport Brass, DOE had some very specific values that they had, in fact, established with the pipe system there, including the -- the -- we call it the contamination thickness inside the pipe. The density of the contamination, they had a fix on that. And they certainly had done enough U-238 measurements at Bridgeport Brass, so they had a fairly good fix on the -- on the source term and what the conversion factor ought to be for that as well. With M&C we had none of that. We don't have surface contamination thickness measurements, and that was identified by DOE is perhaps the biggest variable. That would affect whatever dose results that you would get the most. And that's understandable because, again, if you're talking about .1 centimeters versus 3 centimeters of surface contamination, that would make a significant difference in the source of exposure might be.

But you also had other differences in terms of more U-235 at MC --

M&C versus U-238 at Bridgeport Brass. And so, certainly, we felt that it was real problems and trying to apply that without having more information about M&C.

And, you know, I'm a little puzzled, I have to admit, NIOSH asserts that scale could only be associated with cast iron pipes, even in the face of the fact that the 1 million dpm was found in a clay pipe. And quite frankly, I did not see any analysis or evidence to back up that claim that you could only find scale in cast iron pipes. I think, just based on the fact that the -- that the height measurement was found in a clay pipe would certainly raise questions about that. So, I think that's it uncertainty that has not been resolved.

And finally, we -- we -- we had asked to see more data on in-pipe surface contamination. And, again, NIOSH did, in fact, provide what they had. And we went through that carefully because I think this is the linchpin for this particular issue in terms of being able to understand, you know, what the contaminant levels were likely to be and what the workers may have been exposed to.

Next slide, please.

And this is sort of the eye itemized list of what was in the NIOSH data and what -- our responses for each item. The first scale measurements were attributed to areas one and four, and the result was less than 3000 dpm per 100 center -- centimeters square was measured. The issue that we have is that we've all been discussing the bounding analysis and the source term in terms of drainpipes, not other types of pipes. And this sample was taken from a near-surface recirculation pipe. So, this is not a drainpipe.

And that certainly would be questionable, and I'm sure even NIOSH would have questioned us if we were looking at surface contamination in a recirculation pipe.

The second one, locations four and five, that did, in fact, find a concentration of 500 picocuries per gram of total uranium, but that's drainpipes that service one part of Building 10, one activity area, which was the assay laboratories. I know Brant talked about, you know, this, looking for high-likelihood locations for sampling versus a representative sample. But having a sample from one building activity, one laboratory, again begs the question as to -- as to whether or not that is an adequate assessment, an adequate survey. Again, contrast this with sediments where you had, I think, upwards of 20 or more sample measurements that were pretty much throughout the priority-one drainpipes. A much more comprehensive review. This is not comprehensive.

Okay. So, areas three and four, just to continue, total uranium concentration, 1864 picocuries per gram; however, this is for a total loose pipe sediment and debris, just about everything that was in the pipe, and it's not just scale. So, it's -- it's -- it's certainly not easy to know, you know, what the scale measurement is. This is a total uranium debris measurement, that third item.

So, those are the six -- I believe those were the six scale samples that were alluded to in NIOSH's presentation this morning. And -- and there was a --sort of a couple of references to some backup means to represent scale activity, one of which was the beta scintillator, but, again, I think Weston was very clear that the beta scintillator -- any other direct means of -- of

measuring or detecting, I should say, scale in pipes were very limited because of the problems with pipe surface irregularities, geometry, presence of blockages, liquids. I mean, it -- as opposed to direct smear sampling or whatever, using an external direct measurement is useful for identifying but certainly of questionable utility from -- to quantifying the scale activity.

And finally, I think the -- the other backup method was a hypothetical dose and exposure rate methodology that Weston also had, but that was really for site release. It was a sort of a homogenizing all the information on source term and amount of pipe and everything and coming up with a very general dose value or a concentration value that would be for site release. And in -- in our view, that would not be sufficiently accurate for a bounding source term for scale. Certainly, is a methodology, but it -- it was designed for a different purpose.

Next one, please.

I wanted to focus -- you know, again, I think it was laudatory that NIOSH did take the exposure model that DOE had provided in the Bridgeport Brass AWE and move to apply the -- the M&C scale measurements. You know, there's not too many, but certainly the one -- the 1 million, to apply it to see what kind of dose one might've got. And that's what was done. The survey value of 1 million per 100 centimeters square was applied to this modeling calculation. This is based on cutting a contaminated pipe with a -- with interior scale. And NIOSH, in doing so, found that the -- that the exposure to the workers were increased from 71 to 96. That was pre -- committed effective dose. That was the conclusion and that this would not be an SEC issue.

And in our response -- now, I think I touched on it earlier -- first one was that we still don't know if the 1 million is, in fact, the -- the maximum or bounding contamination. There just aren't really any -- enough measurements to know that. The second item is that the -- and they allude to the additional survey data that would backup that 1 million figure, but as I noted in the earlier slide, the ones that are relevant, the ones that are unequivocal, for scale in the -- in a drainage pipe are two. You have two measurements out of the six, and we believe the other four are not valid. And the backup means, whether it's the beta scintillator or the hypothetical -- whatever it is -- hypothetical and analytic model, we don't believe would be sufficiently accurate, given the limitations for those. And the key here, I think, again, is that whereas with Bridgeport Brass, DOE had a better fix on the parameters, whether it's the thickness of interior pipe surface activity or the contaminant density, which is another factor in that equation. That information is not known for M&C. And -- and -- and, you know, even though NIOSH notes it can increase the 95th percentile by a factor of two to get even higher margins of conservatism, this -- this goes to the concerns that I think we discussed earlier that the work group has expressed before, that, sure, you know, if things -- if the issue becomes fraught with uncertainty, you can always add more conservatism. But at what point does that become a question of plausibility, you know, just going for a large number for the sake of having a large number of versus some linkage to the actual -- the actual data.

So, in final analysis, even though I think it was certainly a positive attempt to try to see where things might be using the modeling that was

available for Bridgeport Brass. And we didn't recommend doing this. Again, the -- the citation of Bridgeport Brass was simply to illustrate the exposure pathway that we felt ought to be addressed at M&C. But the fact that that model was applied, I think, is positive, but we just don't think there's the comparable level of understanding and information that would inform the parameters that would go into that calculation. And that's kind of where we came off on that one.

Before I go --

MEMBER MARTINEZ: Joe, I have a question --

MR. FITZGERALD: -- yeah, I -- are there any questions on that?

MEMBER MARTINEZ: Yeah.

MR. FITZGERALD: Oh, I'm sorry.

MEMBER MARTINEZ: Yeah. It's okay. Yeah, here. I had two questions, I think. The first one was about number of samples, like, basically about the survey data. So, do you have, just as a qualitatives, of -- so there's X amount available. Like, what percentage of that would you say that is of, like, the dream that -- that what you think is like a good number of survey? Is it, like, one percent? Is it, like, 20%? Is it, like, 60%? What would you -- in terms of what you would like to have seen for the number of survey data available?

MR. FITZGERALD: Actually, my threshold was relatively low. I just wanted to see samples any -- any samples beyond the 1 million because the question is that's -- you know, that's kind of a notable number that -- you know, that sort of, you know, catches your attention. So, the question is -- I know we had a fairly good distribution in -- in comprehensiveness in the

sentiment survey that Weston did. What's the comparable assessment that was done with scale? And since scale and sediments seem to go together and were referenced together as being a source of concern inside the drainage pipes, I think that was sort of an obvious question. And, frankly, there weren't any data that I could find, you know, highlighted outside of the 1 million. And that's kind of where we left it.

And what I -- what I have highlighted is what NIOSH came back with. Now, I have since looked at the -- the source of the information in Weston that this data was extracted from, and, you know, I don't disagree with NIOSH that this is pretty much all that's there. But as I pointed out in that one slide, what's there raises some questions about validity. I mean, there's one case it's not a drainpipe and another case, it's -- it's basically, loose debris. It's not scale, per se, even though scale's probably in there.

But to answer your question, I was at the first level of just wanting to know if there was any data. I hadn't seen any. And I think the question was, is there any valid scale data to marry up with the sediment data that would give us confidence that -- you know, that 1 million is a high number, a typical number, or, who knows? You know, and -- and -- and given the results so far, I -- I still -- I guess, still have that question. I mean, there's only one location for which there were two samples that are clearly scale samples, and that's pretty much it. And I -- I don't think that's -- that's -- that's an adequate result of survey result, if you're looking for confidence as to what the source term might have been for scale and what the exposure potential might have been for workers. We could, as an article faith, just go with the 1 million. And that's kind of I think, where things are now. But I

think the -- you know, not having any or not having more than just the one location sample in building 10 leaves me short. And I guess that's not a good answer for your question about what the magic number is.

MEMBER MARTINEZ: No, that answers it. I wasn't -- I was looking for like a qualitative --

MR. FITZGERALD: Yeah, I'm mean, there's -- there's not a magic number.

MEMBER MARTINEZ: Yeah, yeah.

MR. FITZGERALD: I frankly --

MEMBER MARTINEZ: Yeah, no. I don't -- I don't believe in magic numbers.

MR. FITZGERALD: Yeah, I wanted to know if there were any samples that were available that could inform that question. And I think, again, NIOSH did a yeoman's job because I did go back and look at the source survey information, and this is pretty much it. I -- again, I'd like to know if Weston -- and I couldn't find any background documentation, but whether Weston actually did more than a spot sample on scale. It didn't seem like it had the comprehensiveness that was given to the sediment survey. Because again, I think they did look at almost all the drainpipes for sediment. But for scale, it looked like it was pretty much a spot sampling exercise and even there, it wasn't done -- beyond the beta scintillator, it wasn't done very often. It was here and there. So, --

MEMBER MARTINEZ: Okay. Thank you. That -- that does answer my question. And then, I guess, my second question is not so much a question as an observation.

MR. FITZGERALD: Okay.

MEMBER MARTINEZ: The -- the -- the fourth bullet point, so this is interesting because I, like, personally -- I don't necessarily think that this is the best way to handle uncertainty, but with that being said, there are other cases where this style of approach is done. For example, it's not exactly the same -- obviously, I understand that it's different. But, like, in determining reference dose for toxicity in the EPA, like, when there's a specific type of uncertainty, you use an order of magnitude, right. So, again, I personally don't think that -- that that level of conservatism is -- is necessary, I guess. I don't know if that's the right word to use. But I just wanted to make the observation that this isn't just a -- probably just a random thing to do, but that is the tendency of how we deal -- of how folks deal with uncertainty sometimes.

MR. FITZGERALD: Yeah, and I don't -- I don't dispute that. I think how one treats uncertainty, and in this particular example, it -- it's the context of the -- of the situation as well. And in this case, you know, applying the Bridgeport Brass, you know, parameters to trying to come up with a dose value for M&C, you know, clearly, you're gonna have uncertainties. I mean, you know, again, you're -- you're -- you're applying T, which is the thickness and you're applying the termination density, which is for Bridgeport Brass. You don't know those for M&C. So, yeah, you need to treat the uncertainty. And I think what NIOSH proposed was to increase the 95 percentile by factor of two.

But my question goes back to, you know, at what point does, you know, putting that Band-Aid on, figuratively speaking, not make sense or is

not plausible, because, you know, we don't know what the parameters are for M&C. And, you know, applying the Bridgeport Brass parameters may not be appropriate if, in fact, the you don't know the thickness of the surface contamination or some of these other very significant influential variables. And, you know, how do you know if even a factor two would be enough, you know. It's sort of -- you get into this gray area where you may not be able to fix the inherent uncertainty of what you're doing by picking a -- well, we use a -- I -- you -- I want to say extreme conservatism, but, in fact, trying to create a large enough number that you can encompass the inherent uncertainty of what you're trying to attempt, in his case. And that's kind of where I think the context is important as well.

MEMBER MARTINEZ: Okay.

CHAIR BEACH: Joe, Dave -- Dave has his --

MEMBER KOTELCHUCK: Yeah, --

CHAIR BEACH: -- Dave has his --

MEMBER KOTELCHUCK: -- I -- I wanted --

CHAIR BEACH: -- hand up.

MEMBER KOTELCHUCK: to resp -- to talk a little bit about what the -- Nicole's question. I -- I don't know what -- how -- what work and specifics of your EPA work, but this is basically a workers' compensation issue. We're trying to deal with some fair compensation for people who have cancer, okay, and whether it's job related. And it seems to me the essence -- I mean, we say in this program, we are claimant favorable. The essence of claimant favorability. And that's true for all workers' comp in all kinds of areas. The essence of that is that where science is not clear, you have to --

you have to favor the claimant. And to me that is essential. So, to say that we don't have anything -- if it's not adequately pinned down and you have real people, I feel like it's the essence of what we're trying to do as a workers' comp program as -- as applied to radiation -- radiation workers. That's all. And that's why I'm so -- every time I say well, you know, we don't -- we don't have sufficient information, it -- it does play an important role in my thinking. That's all.

MR. FITZGERALD: Yeah, and -- and thank you for the comment. And I certainly agree with that -- that theme, that position. I think what we want to provide though, is the counterpoint to NIOSH's claim, again, using the Bridgeport Brass methodology. And -- and you now have, I think, the full perspective that yes, it gives you a value, but it gives you a value that's not based on M&C information and, you know, whether that is -- in fact, is claimant favorable or not, I don't know. It's just the numbers are different.

In fact, it may be more claimant favorable to increase the thickness of the --of the pipe surface activity assuming that was a very thin layer -- I think it was .1 centimeters at Bridgeport Brass -- may not be applicable to M&C. Maybe M&C -- who knows. We don't have the information. It may be 10, 20, 100 times greater. And that would be a significant difference in terms of the assigned dose to an M&C worker versus a Bridgeport Brass worker.

So, that's -- that's kind of why we're raising this to be consistent with what you're saying is that one has to be careful because if the parameters are not applicable or can't be tied to the site that you're talking about, you may underestimate the source term or underestimate the exposure to the

workers. Because, again, those parameters may be different. The variables may be different.

And I think it's arguable, given the descriptions for Bridgeport Brass -- because they did clean those pipes pretty well, and it was a very thin layer scale. It's very possible to scale levels for higher at M&C. In fact, for the 1 million dpm 100 centimeter squared, the fact that that could be swiped to get that value suggests that you had a thicker layer. So, that's kind of -- I -- I don't think what you're saying is inconsistent with what we're saying. We're just saying one has to be careful not to underestimate the dose and -- and also to be careful about how one applies the margins as well.

Any other questions on the scale? I didn't want to overdo that one too much.

Okay. Moving on to confined spaces, and I think I touched on this earlier. The presence and effect of confined space work at M&C was just not reflected in the exposure modeling. And what struck us again was the worker interviews that were highlighted in these supplemental review where the workers clearly -- clearly identified most of the work as taking place in trenches, pits, you know, it's just -- it was a lot of subsurface activity.

And the -- the question was, since confined space work can lead to an increased resuspension and concentration of particulates and aerosols, how was that addressed or, you know, whether it was addressed. And we did not see any evidence that it was addressed.

So, it was sort of, again, a question of here's something that makes a difference in terms of resuspension. Should it not be addressed in the in the -- in -- in the dust -- dust load factor or not. And that was the finding.

It was just the finding that, you know, we looked at the Mound project data, looked at the description of the monitoring that was done in that -- that backed up that survey data, and the -- the -- what do you call it -- the monitoring equipment was 15 to 20 feet away from the -- the trenches that were being excavated. So, you weren't really measuring what the dust loading or the resuspension would have been within the trenches themselves and would that dust loading or resuspension and greater inside the trenches; there's a -- there's a good likelihood it might have been. Do we know for sure; no, because there was no monitoring that was done. And that's where we had concerns about applying the -- the Mound study data per se as the basis for the dust-loading factor. Just didn't think one could do that without considering confined space effect.

And in fact, the -- the Board guidelines for surrogate data usage is pretty clear that you -- you need to have equivalent conditions and -- and in terms of the sites that are being used or applied in this case and that we didn't feel that equivalence existed between the Mound excavation and the M&C trenches because of that -- that question.

This was the NIOSH response in the August report. And, again, there was a lot of details in there. One question was where we had mentioned the Beckett line, which was a trench that was fairly deep and being worked in for six months. I think NIOSH wanted to clarify. And we certainly accepted the clarification that even though the M&C maintenance workers, in fact, worked in the Beckett line trench, they weren't there for the entire six months day in and day out. They were -- and this is -- this applies to them in general. It's a task based, intermittent type of work. So, again, they would have been in

and out. But I think the notion was to emphasize the fact that the maintenance workers weren't simply doing short-term utility installs. They, in fact, could be doing something as lengthy as this involving trenches that were eight to 10 feet deep. So, that was the reason why that was mentioned.

And we don't disagree that the drain-line work was located in, you know, three to four feet -- and I think Dave had highlighted that there might be evidence that was it was deeper, and that's very possible. But in terms of drainpipes, you're talking three to four feet below facility grade. And they -- that's not considered -- NIOSH wanted to make it clear it wasn't considered confined space in a standard industrial practice.

And a comment was made that the priority drain lines only made up a small area of building 10 and that workers rec recollected that the confined-space work and other areas did not have a radioactive contaminants source term. I think Brant mentioned that.

And finally, and I think this has already been mentioned -- that NIOSH, based on SC&A's commentary, is committed to reviewing recent suggestions to look at the dust-loading factors, and that would include a more global assessment of confined spaces, and will incorporate the methods suggested by SC&A as -- as they see necessary in your supplemental review. So, that was pretty much the conclusion that was in the last response.

Okay. Our response -- and already touched on this that, again, the -- the Beckett line was there to illustrate that a -- that there were some long-duration work, but, in fact, the maintenance work tended to be task based

and intermittent. Josie mentioned this ergonomics issue and, you know, yes, a lot of the trenching for the drainpipes were the three to four feet, perhaps. I think that was the that was discussed. But when you're actually working -- you have to consider the ergonomics. We're not talking about a regulatory threshold, a permit process in the context of confined spaces. OSHA definition doesn't even talk about depth. Okay. It just talks about, you know, the fact that you're in a space where the -- the atmosphere's confined, and there's no readily -- ready egress and entry. That kind of thing. What we're talking about is where the impact to the reason -- breathing zone and the workers could be affected by -- by the -- by the confined space, even if it's three to four feet deep. And it does have to do with the proximity and the type of work being done. And, again, that's something that we felt could be addressed fairly readily, you know, in the TBD -- so to speak, TBD process. I think there's a number of studies, certainly a number of suggested resuspension factors. I think it's, you know, certainly very doable.

However, again -- and I'll keep coming back to this, because this was the finding that we've -- we do believe that the -- the question is the sufficient accuracy of using the Mound project data as the surrogate. And some mentioned has been made a NUREG. I think, certainly, SC&A has advocated for it. We're open to it. So, I -- I just think this needs to be pursued further. I think we're just concerned that the Mound project data would not be a good fit for the reasons that we have mentioned in the past.

Next one, please.

Oh, I'm sorry, is there any more on that? Any questions on the

confined space? Okay.

MEMBER KOTELCHUCK: Is it worth mentioning something very basic that we started out from the beginning that we don't have work records of where the people were working, so that we're forced -- and -- and people were working across their standard skill lines, you know, plumbers, electricians, etc. So, we're forced to say that we have to consider that all of the claimants, all 400-some are -- are -- the 400 claimants are -- have to be considered working in -- all over the place, but that means they will have to be working in the -- the subsurface areas.

So, where -- I mean, we are really forced to spend so much of our time in this -- on this one area of subsurface work, when this is a big plant. There were people doing lots and lots of things. But without work records, we can't even separate people into their jobs. And so, we have to have, as I said before, one size fits all for the exposures, you know.

MR. FITZGERALD: Yeah, and I -- I -- I -- I think that's why we feel the dust-loading factor's important. It's one of the three legs that -- upon which the bounding analysis is based. And without that reflecting confined space in some fashion, we think that three-legged stool is a little wobbly. I guess that's the way I would say it. Because it -- it needs to apply to all workers, which the -- the dust-loading factor would. And it would, perhaps, lend itself to a bit more conservatism that would address those workers that would, in fact, be in a situation where the confined space might concentrate the resuspension of particulates and fumes more. Would it affect all workers; no. I think that's your point. But you have to pick the lowest common denominator that would apply to everyone in order to -- to fit it to

those that actually wouldn't be exposed.

So that's -- and that's exactly the context of why we believe the dust-loading factor ought to reflect confined space consideration. And I know that's going to be looked at and reviewed. And there are certainly pathways for resolution. So, again, I think from the very start, we saw this as a TBD issue, but one that needed to be raised as a finding because we thought it was significant.

Okay. Going to the table two. And, you know, NIOSH wanted to provide a new table to provide -- and this quote was already there -- but more context regarding the intrusive types of work performed in other AWEs. And this was in response to SC&A's table one, which I think I explained earlier, was to contrast the -- what we considered the more -- relatively more intrusive activities at M&C with what was identified for other AWEs. And I think, again, NIOSH, believed there were similar enough activities at these AWEs, similar enough to what we were identifying for M&C that table two was generated. And I just listed -- that's not a complete list, but it's sort of a reflective list of the kinds of intrusive work activities that were in the new table two, just to give some flavor for what was identified for those facilities during the residual period.

Next one.

And our response, again, we don't -- certainly don't dispute the activities that are highlighted in the new table two, but we want to remind the work group that this wasn't a new issue. You, in fact, in 2020, had asked the same question. And how -- how M&C compares to the other AWEs. And NIOSH got back and -- this is sort of a quote from that response

that the pathways leading to internal exposures from alpha-emitting radionuclides, such as uranium and thorium, are identical -- identical for workers at all these sites, and this is including M&C. The inhalation and ingestion of resuspend contaminated dust -- and we took exception to that general statement.

And that's why our -- that's where our table one in our supplemental review came from. And we felt, based on the interviews and the nature of the work by degree and proximity and the nature -- and the nature of the work itself, that the M&C workers were exposed closer in -- and by degree to radiological source terms that weren't the case at other AWEs. And, again, there's some similarity between table two and what we have at M&C. But in the end, the fact that it was necessary, I think, to derive more exposure models for M&C reflects the fact that the -- you know, this is different from the more passive scenarios in OTIB-70 and TBD-60. And based on the worker interviews, there was some compelling reason to want to bound those pathways that you would not have necessarily done at the other AWEs.

And I appreciate Brant's comment that, you know, some of these -- these bounding exercises were done in the spirit of working with the work group and SC&A. But again, I think it's consistent with this concern that we've had that, in fact, this wasn't just a classic uranium and thorium resuspension circumstance at M&C, but it was something much more. And I think in our original supplemental review, we actually provided illustrations from the NUREG NRC generated to show that the activities and the level and proximity of the exposures align much better with what NRC classified

renovation work than it did for the more passive residual work. So, again, I think this is probably much more subjective than objective. But I don't think we've changed our view on that.

Well, here's a hot topic. Anyway, data applicability, and this was the NIOSH response in their August report. NIOSH validated a bounding source term that applied appropriate resuspension dust loads for the various operations described by the interviews. These are the six bounding analyses. And one of the primary reasons for the survey that Weston did in '95 was the quantified risk to ongoing drain line maintenance workers. I think that was a point that Brant made.

And finally, although the frequency of clogged drains may have increased over time, the work activities, the techniques to unclog those drains in NIOSH's view did not change throughout the entire residual period. In -- in our response -- and I -- I went back and pulled a statement from the supplement review from last year, because I think this still, in our view, captures our -- our -- you know, our perspective on this. The use of a high exposure or concentration value based on a set of specific workplace -- and this -- in this case, the pre D&D sediment survey data to bound or represent that of other workers in a facility or on a site, particularly over a lengthy time period -- we're talking 27 years now -- would not be appropriate if their exposure potential could be higher, conditions were different, or if there's a lack of information upon which make that judgment. And that last item is probably the toughest one. We -- we -- we -- we certainly focus on that relative the coagulants.

And, again, we have identified, I think, several issues that speak to

uncertainties for potentially higher exposure pathway source terms, including coagulants, contaminated scale, confined spaces, although again, that's -- that's -- that's a tractable issue, and later on we also identified contaminate machinery and equipment. This is AWE era, contaminated equipment and machinery that has been repurposed for use later.

And yes, we do go back to Linde Ceramic, because we find the parallels very close. And I'm not talking about close in terms of dose or close in terms of source terms. It's -- it's close in terms of the kind of considerations that both NIOSH and the Board took and what, in the end, was the basis for the HHS designation of an SEC for a portion of that renovation period.

And I think -- I'm not going to go through -- you can read that in our report, because I did reproduce that -- pretty much that whole basis for the Linde Ceramic, but the questions raised, the judgments made, and the uncertainties that were addressed are very close in terms of paralleling what we're addressing here at M&C. So, in addition to the transcripts of -- of Dr. Melius's and others' discussion of some of the policy questions, whether it's plausibility or sufficient accuracy, I would also urge you to read the basis for the Advisory Board recommendation, and the HHS designation of an SEC for Linde Ceramics because, again, I think that lays out very well how that judgment was made. And again, it was with imperfect information, and the application of -- of -- of data to encompass the residual period, because there was no monitoring information and addressing questions of -- of incomplete information and uncertain source terms, very much -- very similar issues.

Next one, please.

Any -- any comments or questions? I don't want to go too fast either.

Okay. Worker protection. And I think NIOSH was -- had mentioned this. Work practices (indiscernible) in the work group's concern. And this is also encompassing training and some of the administrative things that -- that Brant mentioned -- do not affect the source term, any of the three legs of the stool that form NIOSH's bounding method. This came from the August report.

And what our response basically is, is that the differences, whether it's how workers worked, the conditions and processes of that work, and the RAD controls under which they performed their work, all contribute to the uncertainty over the comparison of the two time periods. It's not a question of whether it impacts the source term, moves the source term, so much, but whether it contributes that uncertainty of whether or not you -- because you don't have records. There's no record. This is something that Dr. Kotelchuck raised. You don't have any records, so you don't know where workers worked, what they may have been exposed to. There was no controls, so the -- the -- the extent to which they were exposed was not managed. And the -- you don't have any real details on the conditions and processes of that work in terms of -- of how it was done, other than the recollections of the workers themselves. And that's what we really have is the interview recollections, but we don't have any other operating -- or records of that particular time period. And that's where, I think, you -- you have the uncertainty involved with this particular question.

And this -- this issue, very specific issue, was raised on the HHS

designation for the Linde Ceramics SEC. So, again, another reason to take a close look at how both the Advisory Board and the agency handle that particular SEC.

Next one, please.

I think this was mentioned. Oh, yeah, it was -- certainly was mentioned. At -- at the -- you know, the information -- I think NIOSH was critiquing the information that was presented by the work group at the August meeting and took -- took exception to how OTIB-70 was cited and interpreted. And likewise, objected to what they thought was an interpretation -- misinterpretation of NIOSH's use of extreme conservatism. And they felt that that, you know, was being attributed to the being implausibly high -- interpreted to be implausibly high, which they felt was incorrect.

Next one, please.

In terms of OTIB-70 and TBD-6000, for that matter, we just are questioning the practical application of those standard modeling approaches where -- when you have unique -- unique conditions, intrusive activities, processes at M&C. And we agree with the NIOSH comment that, you know, they -- the OTIB-70, for example, one has to make a thoughtful selection of the appropriate resuspension dust-loading factors. And in fact, one can adapt and -- and, in fact, OTIB-70 has been adapted in terms of the bounding exposure analyses that are now available.

But I would point out that -- and this is the second bullet -- that NIOSH itself found that it's ER -- within its -- in its ER for M&C, that OTIB-70 does not specifically and adequately addressed the potential exposures from

digging, snaking, replacing clogged drain lines, repurposing M&C equipment. This is back in 2017. So, you know, we weren't the only ones that felt that -- that, you know, OTIB-70, as a -- by itself, in terms of its resuspension models may not be adequate for a number of sites, and in particular, for M&C. There were some issues, and it wasn't directly applicable. And we go further and add to the list and say, you know, you -- you have other issues, too, that would, in fact, raise questions about whether the -- the more passive resuspension scenarios of OTIB-70 would be applicable.

Moving to extreme conservatism, all I'm gonna say about that is that we did not do any interpretation. We just literally -- and you can go back to both the -- the most recent report that we've done, as well as the one back -- I think it was April -- that -- both of which followed NIOSH's mentioned of this concept in January of two -- 2023. We just frankly quoted, literally, the definition and scope of extreme conservatism. And this is, again, NIOSH's term, pretty much precisely as given and did not try to change the context or be selective. We just basically quoted it. And, again, our concern was, it seemed like it encompassed all the uncertainties, unknowns, and questions that would presumably form the basis for an SEC consideration. So, again, we were concerned about its scope and -- and reach and its application. You know, again, concerns over where -- where we did see -- and I think even Tim had spoke to some of the efforts they had made to, you know, add conservative considerations where somebody's working in a particular situation every day even though that's not unreasonable and -- and -- and doubling the 95th percentile. I mean, and I don't disagree that the regulations provide, in fact, encourage conservatism. The -- the question is

whether this brand of extreme conservatism, which is defined by NIOSH, in the January report -- response report is in fact a plausible approach when you don't really have the information in hand.

And I think it was a question early about, you know, when conservative margins ought to be considered. It isn't -- not -- and -- and whether or not that's sort of a normal way of doing business. And I -- I think for a compensation program, you absolutely need to add conservative assumptions. But the -- the question -- and we go back to Lindsay (sic) Ceramics, because this is where it had come up and there -- and there was a lengthy discussion, and you can read all about it in the transcripts for that -- for that meeting. But it's a balancing act of -- of -- of certainly applying conservative assumptions and statistical margins. But when you get to the point where it's simply a large number to compensate for lack of information per se, then one has to be careful. And I think it's an admonition more than anything.

And I think the last bullet says it all. If NIOSH's bounding model cannot account for M&C's -- and this is the quote from what -- what is -- what NIOSH identified as the scope of what extreme conservatism would apply for -- intrusive activities, high-exposure conditions, uncertain facility activities, or unknown contamination sources. Then I think you do have to start looking at whether the result would be sufficiently accurate and whether, you know, plausibility might become a concern. And this was the lesson and the caution that came out of the Lindsay (sic) Ceramic SEC review.

And, you know, we -- we quote a lot of people. But the quote I

wanted to bring forward by Chairman Melius back then -- I wanted to use that because it balanced what I thought was a selective quote that was in NIOSH's report that -- that just spoke to -- you know, high numbers were actually satisfactory. And I think, you know, there's been some discussion of this. But this was the counterpoint. This was the counterpoint that I think needed to be said. And that's why I highlighted Chairman Melius's comment, because I think that just shows again, there's a duality of this where you have to balance the need to be conservative and to try to maximize the dose value in a bounding analysis, but at the same time, be conscious of the -- of the plausibility of doing so. And it's like, can one hold both thoughts in your mind at the same time? I think it's possible. I don't think it's one or the other. But I think that's the -- the admonition that came out of that review. I think it's very relevant to M&C as well.

Okay. AWE equipment, this is an issue, which has popped up here and there, but really, I -- I didn't think it got much traction. And it concerned me because certainly for Linde Ceramic, there was quite an exchange on this issue. And even so -- so far as a work group member made it -- was pretty adamant about the fact that his personal experience in doing D&D was -- the most notable contamination tended to be under -- under equipment and machines and being moved and -- and also interior to the machine itself. And -- and that was his experience in terms of, sort of, the higher contaminant comes to -- I'm sorry -- contamination levels.

And we raised this issue in the supplement review, and I think NIOSH's response and this is reflected in the -- in the August report was that, you know -- that the -- in general AWE operations were D&D, and for

M&C all the RAD material is removed and in the '55 to '68 time period and any scrap material machining -- machinery was collected 55-gallon steel drums and disposed of. Our response was a concern that the -- that the -- it was a potential exposure pathway, however, for AWE equipment that was retained. Not all of it went out the door and was disposed. Certainly, some of it was repurposed, moved, and subsequently maintained in the facility during the residual period. And D&D activities, since this -- this machinery wasn't being disposed of, and there was no apparent contamination around it or on it, it would not have been addressed. And certainly, there's a -- there's this question of whether or not that exposure pathway would -- would be prominent or not.

And this -- this -- this is, again, another open question. We do point out, though, that, based on interviews with M&C maintenance workers, there was a fairly extensive activity on the weekends and M&C where -- this is where they moved and repurposed equipment. So, it -- it wasn't a once in a lifetime type of thing. It was actually a -- it appeared to be an activity that was ongoing at the facility, trying to make use of equipment, not waste it, and to repurpose, if possible.

So, again, we just wanted to highlight that. I think it was mentioned very early on back in 2016-2017 but didn't seem to be picked up after that. So, again, there's more details in the report. But that, I think, is a legitimate question that hasn't been fully addressed.

I included this because NIOSH mentioned it as a question from the -- the -- that the work group posed. But from SC&As' standpoint, not speaking for the work group, but our observation one, which was about the

nonuniformity of -- of a -- of exposures on the subsurface outside, you know, we -- we have discussed that. SC&A has no new issues or no new information to add. Although I think we're relatively satisfied, I know the work group has not closed this issue out. And I know, petitioner has expressed some concerns over this at the last work group meeting. So, this is kind of where it ends for us that, you know, we've had no new issues or no new information, but certainly, the issue is still here.

Okay. I want to close -- Bob? Okay.

I want to close with just what, I think, Josie actually provided back in August, because I think -- and this is the echo what Brant has said -- I don't think our position has changed either. The intrusive work activities by maintenance workers at M&C during the research period led to potential exposures, and there's no available monitor data. And I think that's the first -- the first key finding. And, again, NIOSH applies the 1995 pre D&D -- make that clear -- survey data as a basis for an upper-bound residual period exposure. But as we have established and which is pretty clear from HHS designation for -- for Lindsay (sic) Ceramic -- for radiological data from one time period be considered informative about exposures during another time period, there needs to be a similarity of conditions and processes between the two periods. And so, although a claim is favorable inside subsurface bounding concentration has been proposed, we believe there still remains uncertainty about source terms and exposure pathways during the residual period, during the -- 1968 to 1995.

And again, going back to the sufficiency of information, we don't think there's sufficient information to account for the exposure contribution of

confined spaces, pipe scale releases, and released coagulants. And I would throw in, again, machinery and equipment in a workplace not controlled as a radiation environment. And I want to key in on, you know, we're not asserting that, in fact, we have nailed down the source terms and the exposures from these sources. What we're saying is that we don't see the information that would allow you to count for these exposures in the bounding analyses that have been proposed. That's different. And I keep hearing SC&A asserted this, asserted that. What we're asserting is that we don't see that there's sufficient information available. To clarify what we believe is some prevailing uncertainties about the source terms, these exposure pathways and -- after all this time.

And I won't go back over extreme conservatism. But again, I think the caution is that needs to be balanced against the -- whether or not it's a -- it's a plausible approach to compensate if information is -- is insufficient. I think that's the key.

Oh, okay. This -- this was also something that was highlighted as a possible stopping point for the work group. I'll let the work group deal with that one. I think that's it. Okay.

Our conclusions. This is it. We don't think and I -- this seems to again mirror what was said in Brant's presentation -- we did not see any new information or analyses that was in NIOSH's response that, in our opinion, would materially affect the work group's concerns and proposed conclusion. I think we're in agreement with NIOSH's a pathway to address the confined space issue, but we believe uncertainties remain. Key is uncertainties for source terms related to in-pipe contaminated sediments and scale during the

pre-1995 residual period. This again goes back to our finding one in the supplemental review. And these uncertainties are compounded by some undetermined worker exposure pathways due to repurposing of AWE era machinery equipment. And I think the just relative intrusiveness of M&C maintenance work activities as compared with other AWEs.

And I do think that's it. So, are there any remaining questions or comments from the work group?

CHAIR BEACH: Okay. Joe, I think -- I'm not hearing any unless someone has a hand up I don't see. I feel like between your presentation and Brant's presentation, it really brings us to what -- what we've been discussing for the last seven-plus years and really fine tunes everything. So, I appreciate your slide presentation and Brant's as well.

We have two items left to discuss: the petitioner's comments and work group discussions and then a path forward, which would be combined. I would propose that we take another 10-minute comfort break before we get started on that.

So, we are at 2:19 Eastern. Could we come back at 2:30?

DR. ROBERTS: So, it's 3:20 right now, so 3:30 Eastern to return?

CHAIR BEACH: Yes, please.

MEMBER KOTELCHUCK: Okay.

(Whereupon, a break was taken from 3:20 p.m. EST until 3:30 p.m. EST.)

DR. ROBERTS: Okay, well, I have 3:30. May I get a verbal confirmation from the court reporter that she's on?

MEMBER KOTELCHUCK: All right.

THE COURT REPORTER: I'm here.

DR. ROBERTS: All right. Okay, great. Let's do a quick roll call. Beach?

CHAIR BEACH: I'm here.

DR. ROBERTS: Anderson?

MEMBER ANDERSON: Present.

DR. ROBERTS: Kotelchuck?

MEMBER KOTELCHUCK: Here.

DR. ROBERTS: Martinez?

MEMBER MARTINEZ: I'm here.

DR. ROBERTS: And Valerio?

MEMBER VALERIO: I'm here.

DR. ROBERTS: Thank you. Josie.

CHAIR BEACH: I guess I'm talking with my mute on. Thanks, Rashaun. So, we are coming down to the end of this meeting. We have asked or given a placeholder for the petitioner to comment. And while I don't think, Mike, that you have anything formal that you added ahead of time, you've always commented, so I'm going to turn the floor over to you and allow you to make your comments. Good to see you.

Petitioner Comments

MR. MIKE ELLIOTT: Thank you, Josie. And good afternoon, everyone. I think we can safely say everybody is now in the afternoon no matter what time zone we're in, so happy to wish everyone a good afternoon.

Yeah, I did want to try to address some of the questions that came up.

And I think Dr. Kotelchuck and -- and Josie and even Joe Fitzgerald suggested that I could address some of them. So, if I miss anything, let me know.

If I could, just take a minute or two, I'd like to just remind people a little bit about the history of the project, because I think it's relevant. I've heard -- and I have to say, I've been confused listening to Brant Ulsh talk about, you know, brief pre D&D activities and, you know, post D&D and D&D -- I --

You know, let me just say that as far as -- and first of all, I should tell you that my job -- I was an environmental manager at the time. And I was -- this was, you know, I was from -- from beginning to the end, I was the project manager for -- for Texas Instruments, Metals & Controls division. And for us, it started in 1992. It started with the, sort of, a -- a strategic excision of the former burial site. You know, that was the direction we got from NRC. You know, our site had been pretty much released for unrestricted use except -- you know, except for the burial site. So, we started there. And we were working -- we had a consultant at the time, CPS Environmental -- CPS Environmental, which was headed up by Mark Griffin (ph). He was not a Board member at the time, but he later became a Board member to this austere group. Some of you might remember him.

But it became pretty obvious to us that, you know, we couldn't find clean margins and, in fact, the more we worked, we were hearing from former employees well, what about over there in, you know, building five waste management area and what about, you know, here and there. So, in '94 -- so we -- we -- we did, like, a phased approach. And this was -- this

was all -- we called it the nuclear decommissioning project. We didn't even call it D&D at the time, although I will tell you that CPS submitted a -- a -- a D&D plan to the NRC that was approved for the burial site.

And so, in '94, we actually started doing comprehensive surveys of interior and exterior areas. And be -- now, we went back into the interior areas -- areas -- areas because, you know, even though they had been fully released by the NRC for unrestricted use but, you know, we knew -- we could tell with all these health physicists running around -- yeah, we were picking up, you know, levels inside the buildings as well with just, you know, surface measurements. So, in 1994, I personally wrote a supplemental decommissioning plan. All right. I was the author of that decommissioning plan in 1994, which, you know, laid out the scope of the work we're going to do on the additional exterior and interior areas that came up during our comprehensive site survey in 1994.

We had no knowledge at that time -- in '94, we had no knowledge that there was any contamination in the drains or any of the subsurface soils, okay. But we knew it was a big project. A lot bigger than what, you know, a small little firm like CPS could handle, so we brought Weston on board. Roy F. Weston was our, you know, consultant who -- who headed up all of our -- our decommissioning activities. We call the remediation. And as far as we concerned -- as far as we were concerned, everything Weston did was related to the decommissioning project. You know, the characterization was over.

Now admittedly, in 1995 as we were starting to do work on the interiors, we were surprised to find elevated levels of contamination at the

entrance to one of the -- the floor drains, and so we very hastily had Weston, who, you know, because they had all these health physicists on site, and they had the expertise, the ability to do it. We had them do a -- a -- a rapid characterization survey and put together a plan on how we were going to address the drains. I think they did that, you know, in a matter of like two weeks. In that range. It was September of '95. So, it was a -- you know, we didn't consider that, like pre -- we were in the middle of our decommissioning. We didn't consider that pre D&D. We were in the middle -- we were in the midst of it. This was a -- an oops -- you know, surprise that showed up.

And I will tell you that I was there when they removed that piece of fuel rod. I observed it. It was in perfectly good condition contrary to what NIOSH stated in an earlier meeting this -- this year where they said oh, you know, it was deteriorated and corroded and that's what contributed to the soil contamination around the fuel rod. I -- I can tell you that fuel rod looked just as -- as perfect as the day it came off the manufacturing line. It was -- it was -- there was no corrosion whatsoever. And -- and I was the one who arranged to send it down to Erwin, Tennessee, I believe was NFS, or, you know, one of the fuel cycle facilities down there in Tennessee.

So, you know, there may have been contamination, the highest levels of contamination around that fuel rod. But I don't believe those high levels of soil contamination that surrounded the fuel rod had anything to do with the fuel rod. I think that just happened to be a coincidence. That was the place probably where the AWE operations period, the -- the high -- maybe the highest, you know, concentrations of sediment. And -- and again, I

shouldn't say highest, but high concentrations of sediment were discharged, that drain became clogged, and eventually a fuel rod went down into that drain, and -- and it got stuck. So, whether that's the worst case scenario or not, nobody knows.

And I know firsthand -- I made that mistake once before saying I -- I was the one who said the mother lode, and I apologize. I never should have said that. You know, I think -- who is it? The ORAUT -- ORAUT -- yeah, Pat -- Pat McCloskey, he -- he quoted me on that, and, you know, has publicly embarrassed me for that statement. But I know Joe Fitzgerald has corrected the record that we really can't say -- we cannot say. We know that was a snapshot in time, 1995. What we found was a snapshot in time. We have no idea what was happening from 1968 to 1995. And we know that, you know, workers were -- were digging into these -- these trenches, snaking out -- you know, cleaning out pipes. They were removing pipes when they had to.

The question came up about whether or not we used welding torches, and I did check with my colleague John Elliot. He said yeah, we absolutely used welding torches extensively, especially on piping in utility trenches that -- the network of utility trenches that conveyed services to manufacturing equipment.

As for the vitreous clay and cast iron drain lines, not so much. He said they -- they most -- most often used snap cutters, but he said they -- they extensively used diamond-wheel grinders because when they would put -- you know, when they would connect the new piece to the old piece, they'd have to get a clean connection there. So, and -- and he said absolutely,

they were -- they were down -- he said when they used a snap cutter, they dug down at least a foot or two below the depth of the pipe so that they could fit the entire snap cutter, including -- including, you know, the chain and the wheels for the snap cutter.

They had to dig and remove all the soil. And he said there was an immense amount. You know, he said it was -- there was lots of contamination. A lot of times the pipes, he said, were -- were broken. They were removing broken pipes.

And he said yeah, all the soil was, you know, clearly contaminated, whatever the contents were of -- of the pipe that they were removing. And they had to dig down deep. And -- and he had -- you know, he had his head down in -- in the trench doing this work. And -- and because he told us about, you know, the other methods they used, the snaking and things like that. But I do want to reiterate that -- that he said extensive use of the diamond wheel grinders anytime they were, you know, removing a piece of -- of the -- of piping.

Let's see. I'm trying to see what were some other questions that came up that folks had. My notes are all over the place. So, maybe if people can remind me if I left anything out.

MEMBER KOTELCHUCK: Yes. Mr. Elliott, I was asking were there five -- well, were their trenches that were dug five to eight feet, or were they all, you know, two or three feet?

MR. MIKE ELLIOTT: Oh, they definitely went deeper than three feet. I don't know if they went five to eight, but they went at least a foot or two deeper, like I said, to fit the snap cutting equipment in there. And -- and

certainly, --

MEMBER KOTELCHUCK: Oh, okay.

MR. MIKE ELLIOTT: -- you know, I think toward the end of -- of SC&A's presentation, they talked about, you know, repurposing the building. When they repurp -- when we had -- this building -- they were large mills. So, when we repurposed the building, and we didn't know we had contaminated soils, they would dig down easily. I mean, we were taking down during the decommissioning project, five to eight feet to -- to recover the contaminated soil. And -- and a lot of the foundations for the big mills that we were installing when we repurposed the building after 1968, a lot of those -- those foundations were easily that deep. And that would have been done by these -- these maintenance and construction workers that -- the M&C maintenance and construction workers and -- all that work would have been done by them.

MEMBER KOTELCHUCK: Okay. Thank you.

CHAIR BEACH: Mike, this is Josie. How often were the equipment -- how often was the equipment moved around, would you say, that would have required digging into the soil and placing that equipment? Can you give some kind of an example of that? Do you recall?

MR. MIKE ELLIOTT: So, I do remember the -- a lot of the wire equipment that I've seen it referred to from which the -- you know, the coagulant oil -- the -- the lubricating oils were used. I do remember that equipment being moved out. It was in the '80s. I don't remember the exact date.

I -- I mean, one of the things that we prided ourself on was being able

to quickly ramp up. Like, you know, the -- the area that formerly held HFIR, while I was there, it had at least two other lives because, you know, other manufacturing operations after HFIR shutdown.

You know, one of the things we prided ourselves on at M&C was being able to quickly, quickly turn over these lines. I -- I -- I'm afraid I -- it would -- you know, I can't say exactly how frequently it occurred. But, you know, I would say every three to five years, there was some kind of a major move or a new -- a new service installed, you know, maybe a -- like, I know there was a big effort in the '80s to -- to -- to run cable, like -- like, one of our -- our -- the instrumentation department was pulling wires for communications cable, for security, for automation of -- of, you know, equipment and things like that.

So, you know, and the -- the electricians were constantly putting in new services or servicing -- like, we had transformers inside the building. In fact, that was one of our problems during the decommit -- during the decommissioning, we still had active operations underway. So, we had to work around, you know, these -- these high-voltage substations inside the building and -- and the building columns and things like that. So, you know, we were always -- always doing work on the electrical systems, the services, you know, like I said, the -- the instrumentation and communication cables and things like that, that they will constantly running pipes underground, you know. So, it -- it -- it's hard. You know, again, you know, it's hard to remember exactly what the frequency was. My memory isn't what it used to be.

CHAIR BEACH: Yeah. That -- that's okay. That's -- it's a long history

and appreciate you always contributing.

Other work group members, do you have any more questions? Are you -- are you done, Mike? Do you have anything else you wanted to bring up, or?

MR. MIKE ELLIOTT: You know, I always like to reiterate our -- the three points. So, our three-legged stool as -- as petitioners has always been -- and -- and I think SC&A did a really good job describing this in much more detail than I ever could -- that there is no measurement or monitoring data for the -- for this -- for the class of workers covered under this SEC petition. The work they performed was done with no radiological controls, no health physics training, and no awareness of any radiological hazards. They certainly came in direct and intimate contact with elevated levels of residual radioactivity from the AWE operational period. And there was -- as Dr. Kotelchuck has said, on many occasions, there are no known contemporaneous written records of the nature, extent, and duration of construction and maintenance activities that the workers performed.

So, I don't see how you can do a -- a -- a -- a sufficiently accurate, you know, dose reconstruction when you don't have any of that information. You don't know the source; you don't know the duration of exposure. All we have are these, you know, measurements that were done almost 30 years after the start of the residual period, and you're trying to, you know, back-apply this to work. We don't even know what work was done exactly.

All right. I get off my -- I'll get off my soapbox now, and I'll say I'm done.

And thank you.

CHAIR BEACH: And thanks, Mike. And don't -- no worry about the soapbox. We all get on it occasionally, for sure. So, just to remind work group members, Mike, from day one, since the beginning of this project or this -- since we started way back in -- oh, I don't -- I don't -- I don't know if -- if we started in 2016, the first -- the first presentation by NIOSH -- Mike has been very informative, and there's numerous papers that he has presented to the work group. So, those are all available. And before we get to next -- next step in this, I encourage you to read those along with all the different transcripts also.

I'm gonna bring it to the other work group members. Any comments, questions, for Mike --

MEMBER VALERIO: Josie, --

CHAIR BEACH: -- before we move --

MEMBER VALERIO: Josie, --

CHAIR BEACH: -- on? Yes, go ahead, --

MEMBER VALERIO: Sorry, Josie. This is Loretta. I have a question for Mike.

CHAIR BEACH: Okay.

MEMBER VALERIO: So, Mike, you mentioned that, you know, when they were cutting these pipes out, you know, on the subsurface, that sometimes those pipes were -- were broken or, you know, deteriorating, whatever. Did the workers remove all of the broken pipes? Did they -- did they put those in a sealed source when they removed them, or just the area where the clog was?

MR. MIKE ELLIOTT: Yeah, they would not have put them in a sealed

source. They would have just thrown them in the -- the nearest container for construction -- demolition debris. You know, we had 30-yard roll offs around the site, and they would have just thrown it in. And it would have gone to the landfill. And -- and as we know, the Shpack -- Attleboro landfill, Shpack landfill were later discovered to be contaminated with radioactive material, although TI -- TI denies that any of it came from us, but, you know, that's probably where it ended up.

They certainly wouldn't have sealed it. No, I -- I mean, no. There was no seal. They just -- they just, you know, took it out in whatever containers they had. You know, buckets or little, you know -- I'm trying to think what they call those -- hoppers -- hoppers.

They would put it into hoppers and buckets and things like that, and they would transported out to a -- a -- a roll-off container and dispose of it and just send it off to the local landfill. That's -- that's where it ended up. We -- we didn't know it was radioactive, or they didn't know, certainly.

MEMBER VALERIO: Thank you for that.

CHAIR BEACH: And then it's been -- it's been mentioned that M&C maintenance people didn't actually do all the work. That, at one point, I think I read in a NIOSH paper that they were left with clean soil upon which to do their work. Is -- is that your experience, Mike, as being at the plant?

MR. MIKE ELLIOTT: No. Absolutely not. No, the -- the -- they might bring in a contractor to cut saw through the cement slab. And, but -- but then our -- our workers would break up the slab, and they would do the excavation in -- in -- in the a -- you know, to get down to the -- to the pipe. So, it was the -- it was the M&C maintenance workers who -- who did

that excavation.

CHAIR BEACH: Okay. So, even if you had a contractor, you had M&C maintenance right there with them?

MR. MIKE ELLIOTT: Oh, yeah, yeah.

CHAIR BEACH: It wasn't a separate entity?

MR. MIKE ELLIOTT: No.

CHAIR BEACH: Okay.

MR. MIKE ELLIOTT: And they're probably breathing all that. You know, they're probably using radio saws and probably breathing everything that the radial saw -- because we had a lot of surface contamination. We had to scabble almost every surface inside that building. It really was not adequately decommissioned. So, I'm sure whatever contamination was in the radial saws when they were grinding away -- because in those days, you know, nobody -- nobody controlled how they -- they -- maybe they had a little water, but, you know, I work in the asbestos program now and -- and the radial saws, they've been used for years on cutting asbestos cement pipe. And even -- even when -- when they're -- when you have water, there's still high exposures to asbestos you use a radial saw. So, anyway, yeah. The -- the --

CHAIR BEACH: Okay.

MR. MIKE ELLIOTT: The contractor did the cutting of the -- of the cement, and then our guys would do all the -- the digging and the hauling.

CHAIR BEACH: And then just to clarify, the -- the maintenance people did do some cutting on their own as well?

MR. MIKE ELLIOTT: Yes.

CHAIR BEACH: Okay.

MR. MIKE ELLIOTT: Yes.

CHAIR BEACH: Okay. Any other questions, work group members, for Mike while we have him. I'm sure he's not going away in case something comes up, but. Okay, thank you, Mike.

Work Group Discussion

CHAIR BEACH: Okay. Let's move on to the work group discussions. And so, Nicole, Dave, Andy, and Loretta, I'll call on all of you to -- for our discussion at this time. Does anybody want --

MEMBER ANDERSON: (Indiscernible) --

CHAIR BEACH: Okay. All right.

MEMBER ANDERSON: I have a little bit ancillary issue that I've raised multiple times, and that's about the -- the, I think, 13 or 14 of the workers from -- who only worked at the facility during this period of time were compensated, and the NIOSH report said it was compensated on the basis of external radiation. And I think at the time, I was wondering, what was the source term for that external radiation that pretty much all of the -- at an AWE, this is uranium and thorium metal issues, and all of that should have been removed.

So, I'm just curious if NIOSH knows or -- it wasn't in the report that NIOSH put out. It -- it just said that they had five or more RADs of exposure, all from external sources. I'm just wondering what was external sources that they assigned to those workers would have been? Is it skin contact with something? Was somebody carrying around some of the

material at some point or is it -- I don't think it would be medical exposure. So, I'm just wondering what was the external radiation source for those workers?

DR. ULSH: Well, I --

MEMBER ANDERSON: I mean, was there -- was there an event? Was there an event of some kind or during the -- you know, we heard that there was quite a lot of flooding going on. Was potentially these workers were involved in cleanup after the flood and therefore would have skin contact with contaminated materials?

DR. ULSH: I don't recall all the details of the exposure that they got. What I do recall is when we provided you with the -- the list of people who had been compensated, they were dominated by people with multiple skin cancers. Because, as you know, is pretty frequent for claimants to come in not just with one skin cancer, but with multiple skin cancers. That's just the way they -- they happen. I do remember that some of them span both the operational and residual periods. In terms of the specific -- the specific exposure modes, does anyone else on my team have a recollection of that? Don't speculate. If you don't remember, don't guess, but do you remember?

MR. SHARFI: Hey, Brant, this is Mutty Sharfi. Yeah, the main driver of those -- all of comp -- those external dose was -- if you remember the radium dial model that was used, that external dose -- especially with those radium little dials that they were handling was -- is pretty sizable. And so, when you add up that to multiple -- it really had nothing to do with the residual exposure. This was sheerly about the people that are handling those radium dials.

DR. ULSH: Okay. So, that's -- that's the source of the external dose that comp'd out a few skin cancers cases.

MEMBER ANDERSON: I think there was a thyroid in there too, or something.

DR. ULSH: I think I recall that. Yeah. But I think that might have been one of those multiple cancers where it was thyroid plus something else, probably skin. But I would have to go back and look to be sure.

MR. SHARFI: And it's still -- it's still a driver of that external from that radium --

MEMBER ANDERSON: Okay.

MR. SHARFI: -- I mean from that dial. And it was where --

MEMBER ANDERSON: I don't remember the radium issue being brought up when we were looking at compensation issue.

CHAIR BEACH: Yeah, I think that was, like, in my building two. Correct me if I'm wrong.

DR. ULSH: Well, that wasn't during the residual period, was it? Fellas?

MR. SHARFI: So yeah, it started -- the radium bead -- so, I guess I should clarify myself, not like dials. Yeah, it's at the very end of the occupational into the start of the residual in the in the '60s is when the radium bead work was done. So, that was what -- why a lot of these -- when you see these claims that go from covered both periods -- it's those people that were getting the radium bead exposure that was driving a lot of these compensable claims.

DR. ULSH: Okay. So, those are encapsulated sources, right?

MR. SHARFI: Correct.

DR. ULSH: Okay.

CHAIR BEACH: I can remember early on the beads. We petition -- or not petitioners. We heard some interviews where they were actually throwing those around and watching the flash. But it was -- there was small amounts of them in one specific area.

MR. SHARFI: Yeah, it was --

CHAIR BEACH: So, that's my recollection.

MR. SHARFI: it was a very small work over a couple of years.

CHAIR BEACH: Yeah. I think they found some in the floorboards, different things like that over the years, but --

MR. SHARFI: That I can't speak to. I don't --

CHAIR BEACH: It was -- I don't think it was significant. It actually didn't catch the attention of us --

MEMBER ANDERSON: (Indiscernible) --

CHAIR BEACH: -- other than --

MEMBER ANDERSON: -- I mean, the report on the website of the cases said they only had worked during the residual period. If they were there earlier, that certainly would contribute. But it was -- I thought it was only the residual, so I was just curious about --

CHAIR BEACH: That's --

MEMBER ANDERSON: -- I didn't remember the radiation from --

CHAIR BEACH: Yeah. Well, I think that's speculation anyway, Henry. That -- and this was -- you did ask for the -- during that renovation period, so that's when those were from.

MEMBER ANDERSON: Okay. Thank you.

CHAIR BEACH: Anybody else? Dave? You're off the mute. Have you got some comments or questions?

MEMBER KOTELCHUCK: No, I mean, looking -- I feel like this has been going on for seven years now. I think I've spent the first couple of years trying to understand the model that NIOSH was proposing and -- and understand better what the operations were in -- in the plant. I started out strongly with the impression of the three items that Mr. Elliott raised, and they bothered me.

We started out, I felt, with essentially no information, but NIOSH came in quickly. And -- and I believe actually, Tim, before you, I -- Jim Neaton (ph), I believe, said we can do it. We can make a model that bounds. And I was taken back at that time, but I thought let me listen. And I -- I have to say, I mean, people raise all sorts of issues about all sorts of things going on in the plant. And I remember talking about -- in fact, Josie, I think you talked about some of the roofing work that was done. And I have to say, at each and every point, the NIOSH folks responded.

And Tim, you talked about this today. And I -- I will back you up to say that there was no issue that we raised that NIOSH wouldn't investigate. But over -- and I spent those years trying to understand without raising objection. I had that background feeling that there's not much information there, there's virtually none, but okay.

And I also know that I voted and was said to me by staff people, and I'm not sure which ones, you know, who said well, we have had cases where we had made decisions where we didn't have any individual measurements

of exposure to the claimants. And I kind of look back at those, and I recognize first I had supported making a decision without any measurements of the individuals. But usually those were cases -- and I can cite some but -- where people did a particular kind of job that was repeated again and again, and we had things like area measurements.

So, even though we didn't have individual measurements -- and the people did work, that was the same all the time. And so, you could make some -- I felt we could make some sort of estimates, reasonable estimates and -- and reasonable bounds.

But then, this was -- this is -- was rough-and-ready work, as I said earlier, you know, was the emergencies, the come in over the weekend, and often, if need be, or over in the evening, go to work and clean up. And I think I started after a couple of years -- now starting back to three years ago that I began to really change my mind that there were just too many things I didn't know.

I am still at the point that I do not feel that I know with confidence that we have bounded the exposures. I feel like the we just don't know. And I -- I'm -- I feel that as I sort -- as -- as I've indicated, I think, in enough meetings that -- at the point that I don't know. And we're dealing with compensation to workers who are ill. That the absence of data, the absence -- despite the serious efforts by NIOSH, I just don't feel like I know what the -- their exposure -- people's exposures were. And I don't necessarily know that they were very high or not that high. I feel like I don't know. I still don't know.

And the last few -- I guess, the last year or two -- two years or three,

the discussions by and the reports by SC&A were helpful in talking about issues that I know only glancingly. I -- certainly, I don't have a familiarity on the floor of working with those. So, I'm at the point of feeling as if we now are in a case where we're locked in. We're saying the same things to each other.

The NIOSH and the work -- and -- and -- well, NIOSH and SC&A are saying the same things to each other, and I think we are -- I -- I am feeling that the NIOSH folks are making a presentation that I agree with. So, I feel as if there's no -- I don't feel like there's point in just keep going on. We keep, you know, talking to each other and -- and I feel like we're locked in. And so, I feel like it's time to bring it to the Board.

CHAIR BEACH: Yeah. And -- and Dave, I -- I appreciate your comments. And I too feel the same way. I wanted to make sure I gave all the work group members a chance to kind of vent their feelings on where we are before I made any sort of formal movement and to take it to the Board. But -- but -- but that's my inclination today. I agree. We have said the same thing over and over. We've been at it for a long time.

But I don't want to start that. I appreciate what you said. I want to give the other work group members a chance, and then I'll make a formal recommendation to the work group to where we go from here.

But Nicole, Loretta, I wanted to make sure you guys had an opportunity to -- to voice where you're at or if --

MEMBER MARTINEZ: Thank you, Josie. I -- like, I'm new. I get that. One thing that I really think would be useful to reconcile is that I -- I hear this and not might not be, like, the intended messaging. But in

listening to all this, a lot of times I hear, you know, X thing isn't conservative enough or I'm not convinced this is bounding and then I also hear oh, but this is too conservative. And they're -- I -- I think they're on different things. But those that kind of message is -- is -- it doesn't feel like it goes together. So, if that could be reconciled, I think that would be very useful.

CHAIR BEACH: Yeah, I think if I understand what you're saying, that was what we talked about a lot with Linde. So, where it was very conservative, not conservative enough, and it's -- yeah, so I -- I hear you. Thank you.

MEMBER MARTINEZ: Yeah.

CHAIR BEACH: All right. Loretta, anything for you?

MEMBER VALERIO: Can you hear me?

CHAIR BEACH: Yep, we sure can.

MEMBER VALERIO: So, I agree with -- with -- with Dave that this is -- it's -- it's -- it's been a long -- this has been a challenging site. At this point, I think that we've reviewed everything that NIOSH has to provide, that SC&A has to provide, the work group discussions, and personally I think we're ready to bring it in front of the Board. That -- that's my feeling.

CHAIR BEACH: Okay, thanks, Loretta.

Henry?

MEMBER ANDERSON: Yep.

CHAIR BEACH: I saw your hand.

MEMBER ANDERSON: I --

CHAIR BEACH: I actually saw your hand this time.

MEMBER ANDERSON: That's why I didn't put up my -- my funny

looking hand. I guess my concerns are very much the same. I'm uncomfortable with the use of the Mound data is really the core for the air contamination issues, and I'm not sure it meets our criteria as it's pointed out. And I think that's worth having discussed by the Board.

Remember back with Linde, there -- when the SEC was approved by the Board, it was not unanimous. Frequently we have had unanimous decisions, but I think this is probably one, again, where we're on the boundary of, again, what we went through with a Linde as can it be -- is it, in fact, the uncertainties adequately accounted for or not over accounted for.

Again, given the -- now we have six additional models, which address the various issues each in a way that, I think, you now have cumulative uncertainties added in to our exposure assessments. That's somewhat problematic. It's helpful that NIOSH has made attempts to model those exposures for us and some of them really are not contributing that much to the overall exposure of the individual. So, I think it's -- the discussion by the full Board, and I think as Chair of the full Board, I would say we're not going to, I hope, raise this for a Board discussion tomorrow. But it --

CHAIR BEACH: Oh, no.

MEMBER ANDERSON: -- has to be -- I mean, a full Board. There's so much in there. We really have to put together what do we want them to read, so they don't just start with something and then don't really go into the issues that we're dealing with, with plausible and sufficient accuracy. All of those really -- and I think early SC&A comments that these are really policy decisions on how much do we need, we're here. We really have no data. So, we're -- we're really -- during the period we're left with, are we

going to only work as we can. The only data we have is from the '90s at the site.

Then we have potential use of surrogate datas as well. So, we have multiple issues that are really -- you know, impact on policies that we have. I really think it's important that we be -- partially why I raised the issue of those who were already compensated, that it's important that we maintain continuity with past decisions.

And I -- NIOSH feels that this is very similar to all of the AWEs, or many of them, where I think, my concern is, we really are close -- much closer -- and I think you raised that -- with the issues that came up in Linde. And of course, that was, I would say, on the edge how the Board would make decisions on SEC determinations and the applicability of those on the plausible sufficient accuracy issues that we have to have. We have to keep in mind that any decision we make or that NIOSH makes can be appealed by the applicants, and we want to be sure -- I want to be sure that we are on firm grounds when we do make a decision that when a new group is put together, as may will occur, they will agree with how we interpreted and how we applied the available data to the SEC decision.

CHAIR BEACH: Thank you. And Brant, I think we'd like to keep this as a work group discussion right now.

DR. ULSH: Yeah, that was my question. All right.

CHAIR BEACH: Thank -- thank you. Henry, I -- sorry. I didn't mean to interrupt you.

MEMBER ANDERSON: No, no, no, that -- that --

CHAIR BEACH: That's all?

MEMBER ANDERSON: -- basically, I -- I -- I think, you know, I would propose that we would be in favor of -- or I would lead in favor of SEC determination and bring that to the Board. Again, we don't need to be unanimous if --

CHAIR BEACH: Yeah.

MEMBER ANDERSON: -- agree with it, then --

Work Group Discussion of Path Forward

CHAIR BEACH: So, I appreciate that. And I had a little bit of a formal process --

MEMBER ANDERSON: Okay. Go ahead.

CHAIR BEACH: -- that, and then I wanted to go over tomorrow's meeting. So, and this is just me layman's -- take notes. Our role as work group -- work group and board members, we are responsible for judging whether proposed bounding scenarios are plausible and sufficiently accurate under EEOICPA. We all agree to that. And NIOSH's last work paper -- work paper or white paper -- excuse me -- did not really address the work group's concerns. I can go into those, but we've already discussed that so I would not belabor the points.

Joe's last slides about the bullets that I brought forward in August are still representative of where the work group is. I'm not going to bring those up. I will, however, on Joe's presentation -- this was also in the August presentation on page 28 -- and I don't feel like you need to bring that up or anything, Bob -- but because of the identified differences between the two periods, residential versus D&D era, there is sufficient -- insufficient basis to

conclude that radiological data from D&D efforts including pre D&D surveys are sufficiently informative about exposures arising during the entirety of the M&C residential period to apply -- be applied in the manner proposed by NIOSH. That's really what we're saying.

And so, this is an informal vote of the work group members to deny NIOSH's SEC recommendation. And -- and as Henry said, to -- the -- the work group would like to advance an SEC recommendation.

And Rashaun, I feel like we should just have a quick vote on where the work group is, because I think it's important when we go to the Board that we give them a recommendation of if it was unanimous, two to two, three to one. It -- I don't care what it is, but we -- we probably should take an informal vote.

And once we do that, my plan, Henry, is exactly what you said. I will make a quick presentation. It's based on my August presentation to the Board. I'll probably skip some of the base -- the beginning slides, but just let the Board know what we've done it at this meeting today, one day before the Board meeting, and where we are, and then give them ample time. But I'm assuming the April meeting is when we will have it on the agenda for discussion. And Rashaun, if that's not correct, you can correct me. But that is my proposal. I -- I don't want to -- like, we don't have -- I mean we don't have -- I have 20 minutes tomorrow, so that's not enough time.

But between tomorrow and April, I feel like we can get the reading materials out and, like you said, Andy, make sure people are aware of what -- what we feel like is important, but provide all the materials.

So, Rashaun, is that -- is that something we can do? Can we take a

vote just within the work group to advance it for a referral to the full Board?

DR. ROBERTS: Okay, let me just clarify. So, the work group -- you want to make a motion that the work group bring the recommendation that the SEC be added to the full Board, correct?

CHAIR BEACH: Yes.

DR. ROBERTS: Am I understanding that?

CHAIR BEACH: Yeah. I don't know if that's the correct terminology, but we're -- we're saying that the work group has done everything we can do and that we -- we are taking it out of the work group's hand and presenting it to the Board for formal discussion and a vote.

DR. ROBERTS: Okay. Yeah. I just need to be clear that this is a recommendation that this work group is bringing to the Board that the SEC be added?

CHAIR BEACH: Correct.

DR. ROBERTS: And if that's the case, I mean, I just want -- for clarity's sake, you know, just get a clear description of the class, the time frame, and the basis.

CHAIR BEACH: Can -- can we -- is -- yeah, is -- can -- should we decide if that is a recommendation that the full Board supports? Sorry, my phone's ringing.

MEMBER KOTELCHUCK: Well, we're, I mean -- (indiscernible), Josie. I mean, basically we're bringing a recommendation to the Board, and our recommendation is that we approve the SEC application and bring it to the Board for consideration, review, and a vote.

CHAIR BEACH: Right.

MEMBER KOTELCHUCK: And I'm more than -- I agree, Henry, very much, that this is not going to be -- this is not going to be one of our unanimous votes. This is going to be a contentious discussion on the Board, as it should be, because it is an issue which is at the margins of the way we have decided in the past. And we can argue, so --

CHAIR BEACH: Yeah. Yeah, so let's -- let's stick with -- yeah, with what we're -- where we're at right now.

So, Rashaun, yeah, I'd like to get that all clear.

DR. ROBERTS: Okay. So -- so, the pieces of information then, I just want clarity on, would be, you know, the years, the class, the basis for the recommendation.

CHAIR BEACH: Right. And that's something that will happen within the Board discussion. I believe I gave you the work group's definition of why we feel it's -- we're -- we're moving it forward. And I feel like we -- we have agreement. We haven't set a yes/no vote at this point, but --

MEMBER KOTELCHUCK: Yeah.

CHAIR BEACH: I don't know that -- I don't know though. The years, I guess, would be pertinent, because -- I would say nineteen -- 1968 to 1995 or '97. Please help me out on that if anybody disagrees.

MEMBER KOTELCHUCK: Well, I mean, the SEC -- the SEC committee -- sorry, the SEC committee has set up years and -- and positions --

CHAIR BEACH: Right.

MEMBER KOTELCHUCK: -- (indiscernible) --

CHAIR BEACH: Yes.

MEMBER KOTELCHUCK: -- I would say -- I would -- I would say that

we -- we support those tentatively, because the Board will make the decision. This is a recommendation to the Board.

CHAIR BEACH: Yes, yes, you're correct.

MEMBER KOTELCHUCK: And the Board may choose (a) to turn down the recommendation or to change the terms of which years and which groups should be added. And that's --

CHAIR BEACH: Right.

MEMBER KOTELCHUCK: -- in their purview. I think we haven't discussed it.

DR. ROBERTS: Right. That's correct.

MEMBER KOTELCHUCK: Yeah.

DR. ROBERTS: The work group needs to bring, you know, the -- the -- what you're recommending the SEC be added for, so --

CHAIR BEACH: So -- so, then Rashaun, I believe, we are asking -- if you go back to my -- my August slideshow, which I will be presenting tomorrow, the class definition is in there, and it is 1968 to 1997. So, those would be the years.

DR. ROBERTS: Say that again, nineteen --

CHAIR BEACH: It is January 1, 1968, through March 21, 1997. That is the class desig -- that's the class that's been evaluated by NIOSH, and that's -- that's where we're at here.

DR. ROBERTS: And you're including all worker -- I mean, I don't want to be putting words into the work group's mouths. That's why I'm asking for just, you know, who are you --

MEMBER ANDERSON: I would use just the --

DR. ROBERTS: -- (indiscernible) --

MEMBER ANDERSON: -- application and then at some point --

CHAIR BEACH: Wait, wait, Henry. Rashaun was still talking, so we missed the first part of what you were saying.

MEMBER ANDERSON: I would use the definition of all the workforce that's in the application.

MEMBER KOTELCHUCK: I --

MEMBER ANDERSON: NIOSH had said that maybe that can't be separated out by Department of Labor. But if we make a proposal between now and April, we should get that reviewed by DOL, and they'll say yes, we can identify workers by these specific occupations or not.

CHAIR BEACH: Yeah. So, we'll go with NIOSH's recommendation, Rashaun. And then the class definition will be -- that's a -- the Board's purview. I mean, we'll recommend what we've discussed and what -- what we talked about here today.

MR. RAFKEY: Josie, this is Michael Rafkey from OGC. I just wanted to reiterate what I think Ashton mentioned a couple of meetings ago, I think Rashaun, has as well that what is brought to the Board should be, like, a fully-defined class along with the scientific and technical basis that you-all would determine --

CHAIR BEACH: Oh, no.

MR. RAFKEY: -- would vote on for the Board --

CHAIR BEACH: Yeah.

MR. RAFKEY: -- to look at, rather than vote sort of generally and then leave that to the Board to figure out. So, I think you would need --

CHAIR BEACH: Yeah.

MR. RAFKEY: I think this has been brought up before, but --

CHAIR BEACH: Yeah.

MR. RAFKEY: -- you would need to do that --

CHAIR BEACH: Michael, --

MR. RAFKEY: -- whatever goes to the Board needs to have that scientific and technical basis as part of --

CHAIR BEACH: Michael, --

MR. RAFKEY: -- proposed --

CHAIR BEACH: I'm sorry, I know I'm interrupting, but we discussed this. We had some emails that went back and forth. This is -- this is new. This is not how it's been done in the past. We -- we have all the documents here for the technical basis and between now and April, we can write that up for you, but that's really the purview of the Board, not the work group to have that in hand moving forward. And you can go back to Linde, the transcripts we all read.

For an example, the work group was at a standstill, which is where we are today. It was a two and two vote, two for two against. We brought that to the Board. The Board discussed it, and the Board did -- acted on it. So, I know you're new here and I -- and I appreciate that. I do have the emails if we need to go through those again. But I think we're within our bounds as a work group moving forward. And I do appreciate Rashaun trying to get it all correct, and I don't mind helping, but I don't want to add things that aren't correct.

MR. RAFKEY: Well, I guess, we would have to disagree then. I feel

like it's important to give the Board when they're -- when they're -- I mean, you-all have been analyzing it for years, as you say, and you know far more about it than people not on -- you know, who are not part of this working group. So, I feel like it's important to have some sort of scientific and technical basis defined as part of the class recommendation and to provide that to the Board for them to look at rather than have them try to sort it out.

DR. ROBERTS: Okay.

MR. RAFKEY: -- more amorphous but that's -- that's my advice.

CHAIR BEACH: Yes.

MR. RAFKEY: And I know you've gotten it before. I just want to reiterate.

CHAIR BEACH: Thank you.

MEMBER KOTELCHUCK: Can I, Michael, --

CHAIR BEACH: Yes, go ahead, Dave.

MEMBER KOTELCHUCK: If you -- if you -- your interpretation is that we need to bring, if you will, the full recommendation with the details and the basis. Then it seems to be well, that's new for us in terms of past procedure, I think what we can do is -- I would like to have a -- a -- a -- just a vote within the -- within the work group, and then not announce anything tomorrow, because according to what you're saying, we don't -- we don't have a sufficient basis to bring it to the Board. And --

CHAIR BEACH: No, that's not correct. Dave, that's not correct. We do have sufficient basis, and I feel like this might be an offline discussion, because we had this discussion back in July. We have emails that went back

and forth between OGC, Rashaun, and myself.

MEMBER KOTELCHUCK: Ah, okay.

CHAIR BEACH: I feel like -- and anyway -- I feel like --

DR. ROBERTS: But we -- we did say at the time that it is the -- the work group, since it's had access to all of the information and has had all this -- these discussions about all of these details, that it really is part of the work of the group --

CHAIR BEACH: Okay.

DR. ROBERTS: -- to be able to bring, you know, a more defined recommendation to the Board for them to be able to deliberate on. And that's not to say that the full Board can adjust dates or adjust, you know, based on its discussion, adjust the class and things like that, but this work group needs to be able to bring a solid recommendation to the full Board.

CHAIR BEACH: And I -- and Rashaun, I feel like we have done that. If you need something in writing, then we will present that. We -- we've done this for July, and now we're here in December and I believe we're closer to the work group all agreeing. I haven't heard from Nicole or Loretta, but I -- I heard from myself, Dave, and Henry at -- or Andy. There's three in the affirmative for an SEC to -- to refer this to the full Board.

MEMBER KOTELCHUCK: Right.

CHAIR BEACH: So, if we need to have the technical basis on one page, then we can certainly do that after this meeting and have it ready well in advance of Board discussion.

Go ahead, Andy.

MEMBER ANDERSON: I was gonna say that I think Joe summarized from much of what they had done and what we had discussed at the -- in the committee of the conclusions there. And then at the bottom, he has the work group's proposed conclusion is, and I would use five bullet points, and that is our justification, and we may need to expand on that. I mean, that's -- that would be, to me, the starting point that we've all heard and we've read it and have time to read it.

CHAIR BEACH: Yeah. I agree. I agree. And I can have that out to the work group members and to the full Board very soon. But my objective was to take it out of the work group and into the Board's hand. However, I'm not going to ask them to vote on it. They're gonna have ample time, and we can put that together if that's the new requirement, to have all that ahead of time. And so, I'm fine with that.

Rashaun, can we go ahead and take the formal work group -- it's not really a vote, but a -- to -- for the recommendation?

MEMBER ANDERSON: I think we need to have a formal vote on --

CHAIR BEACH: Okay.

MEMBER ANDERSON: -- which way do we want to go.

MEMBER KOTELCHUCK: That's right.

MEMBER ANDERSON: Do we want to say that we're concerned about NIOSH's approach, but we're going to support it and therefore deny, or we can say we remain concerned sufficiently that we -- we would like to put for -- we are putting this forward and --

CHAIR BEACH: Okay. Yep, I agree.

MEMBER ANDERSON: -- SEC -- we want this added to the SEC with

the definition that came in the startup this, and the justification -- summary of the justification is these points, something like that. And then we can --

CHAIR BEACH: Yeah. (Indiscernible) --

MEMBER ANDERSON: -- but I think we need to -- if -- if everybody believes these are some of the key factors, we can embellish it. But I -- I think we really need to say are we going forward or not.

DR. ROBERTS: Right.

CHAIR BEACH: I agree, and a vote would be --

MEMBER KOTELCHUCK: Agree.

CHAIR BEACH: -- a good idea.

MEMBER ANDERSON: Yeah.

MEMBER KOTELCHUCK: Can we share -- can we share the five points just to look at them?

CHAIR BEACH: Yeah.

MEMBER KOTELCHUCK: I'm agreement, but I'm doing this --

CHAIR BEACH: You're -- Andy, --

MEMBER MARTINEZ: Sorry to interrupt. I have a hard stop in three minutes because we're 30 minutes past for the end of my -- my meeting --

MEMBER KOTELCHUCK: Oh, okay.

MEMBER MARTINEZ: -- was in my calendar, so I just wanted to throw that out there.

CHAIR BEACH: So, Rashaun, would you please do the vote, and then we can work out the final details?

DR. ROBERTS: Okay. I guess, I'm still a little -- a little bit confused about this and the need to take a vote. Can people just verbally weigh in

and say --

CHAIR BEACH: Yeah, well, I -- I think this --

MEMBER MARTINEZ: I can verbally say, Josie, doesn't know my piece, so since I have to drop off in three minutes, I remain unconvinced by SC&A. I maybe still have some light concerns with NIOSH, but as far as my tentative feeling, I'm -- would abstain currently.

MEMBER KOTELCHUCK: Okay.

CHAIR BEACH: Okay. Thank you. Fair enough. Yeah, it's been -- it's been a lot, so thank you for that consideration. Okay, drop off. Thank you. We'll talk to you tomorrow.

And then as far as in affirmative, I am voting for denying NIOSH -- or NIOSH's recommendation to deny the SEC and to refer it out of the work group into the Board's hands.

MEMBER KOTELCHUCK: Yeah. I support that.

MEMBER VALERIO: Josie, this is Loretta. Can you hear me?

CHAIR BEACH: Yes.

MEMBER VALERIO: I'm driving, I'm sorry. I had to go pick up something. I am in total agreement with you (indiscernible) that, you know, at this point, I'm -- I'm in favor of granting the SEC and sending it to the full Board.

CHAIR BEACH: Okay. Thank you and stop talking to us while you're driving. So, we appreciate you commenting, Loretta. Thanks.

MEMBER ANDERSON: Yeah, I --

CHAIR BEACH: (Indiscernible) --

MEMBER ANDERSON: -- I'm in favor of it -- and you kind of -- your

proposal was a double negative to say --

CHAIR BEACH: I know.

MEMBER ANDERSON: -- we're going to deny NIOSH's --

CHAIR BEACH: Yeah.

MEMBER ANDERSON: -- say can do dose reconstruction, but really the question is are we going -- is it going to be added to the SEC in some version. And before we can decide that the dates need to be different, the definition of the workers need to be different, but we need to say we think it qualifies -- we haven't heard of a reason why we're confident that they can do dose reconstruction that meet the criteria of --

CHAIR BEACH: Okay. Thank you. And, you know, just -- just to back up a tiny bit -- and Rashaun, mostly for you -- I went back and reviewed the last Linde work group transcripts in great detail, and then I reviewed the 2011 transcripts, because I wanted to make sure -- I've never brought anything out of a work group that was contentious to the Board. So, I wanted to make sure what was done in the past. And there was really nothing other than it's time to take it out of the work group.

And Gen -- Dr. Roessler, that was her formal announcement that it was time to take it out of the work group, and it was understood that two of us agreed, two of us didn't agree, and then it went to the Board as a wreck and -- as the -- her position was no SEC. It ensued discussion for a couple of days.

And -- and so, that's why I say the technical -- that none of that stuff has been done in the past. I mean, we can do that but I -- and we have -- I mean, we have everything. That's what we've been doing since July, is

satisfying that criteria that has suddenly been forced upon the work group. And we can continue to do that, and we certainly don't mind if that's what we need to do to move this forward.

But just languishing in the work group any longer, I think, Brant said it at the beginning, there's nothing more that we can talk about. We've talked about it over and in circles, and I feel like it's time to move it forward. And whatever that looks like, Rashaun, I'm happy to do whatever we need.

DR. ROBERTS: Yeah, I mean, I think that's fine. Again, I think, I -- I have not heard, like, in terms of what I know about the Board and what has gone on in the past as far as the recommendation there was always, you know, a clear, you know, who -- if you're recommending an SEC, who's included, you know, what's the time line, what's the basis. And --

CHAIR BEACH: Well, and that's --

DR. ROBERTS: I'm not suggesting that this language in the in the work group, I'm just asking for, you know, a clear description of what the work group is actually recommending in terms of the SEC just to --

CHAIR BEACH: Yeah, and my --

DR. ROBERTS: -- define my point.

CHAIR BEACH: -- I feel like I did that in August, but, you know, it might have been missed in my report in August. And on page two was the SEC petition 00236, and it was the class that was evaluated by NIOSH. And that was the basis of what we've been talking about for the past seven years. So, I -- I feel like that's the basis. If that's wrong, I'll work with the work group and whatever I need to do to get the one page -- everything technical to move forward in one -- one document, so to speak. But I don't

expect us to discuss this tomorrow.

DR. ROBERTS: Right.

CHAIR BEACH: I will simply give a work group update, pretty much what I gave in August, and then we'll move it to be on the agenda for April.

DR. ROBERTS: Sure.

CHAIR BEACH: Yeah, I mean, I think that --

DR. ROBERTS: I think you've already described, you know, that the Board would not have enough time to review the materials to be able to -- to vote, you know, on this tomorrow.

MEMBER KOTELCHUCK: Oh, absolutely -- no, absolutely not. Yes. I -- I --

CHAIR BEACH: No, we don't --

MEMBER KOTELCHUCK: I think it's just a matter of information to them that this is -- this is where we stand, and we will bring a formal presentation to the Board at the April meeting and provide information -- provide a collection of the reports for them to read.

CHAIR BEACH: Yeah, well, it'll be much -- it'll be much like the August and the December white Paper -- or the presentation that I presented, so.

Rashaun, are we -- are you -- are we okay, or?

DR. ROBERTS: So, did everyone weigh in? I know, Nicole did, Loretta, sounds like Andy did. I'm not sure if I heard (indiscernible) --

CHAIR BEACH: Yeah, it was -- it was four for moving it to the Board as an SEC proposal and one abstain -- abstention.

DR. ROBERTS: Okay.

CHAIR BEACH: And I tried really hard to be clear and give everybody

a voice and time to reflect on this work group meeting. And I feel like the work group members had that opportunity, and you utilized it. So, I feel confident and comfortable in our decision. I don't know whether work group member -- I think it's just the three of us left now.

MEMBER KOTELCHUCK: Right.

CHAIR BEACH: So, I -- is there anything else for the business of M&C work group?

MEMBER KOTELCHUCK: No. Not that I know of.

CHAIR BEACH: Okay. Rashaun, would you like me to put together one piece just to get us started? I don't -- I don't think I have the ability to make it as formal as, maybe, the Board would make it, but -- or we satisfied with where we're at, and we can work with it after the December meeting tomorrow?

DR. ROBERTS: Perhaps we -- we can work on it, as you're saying, offline.

CHAIR BEACH: Okay. So, we're okay with the recommendation out of the work group, then -- at this point, and the rest of it, we'll take care of soon.

So, do I hear any other comments or can we --

MEMBER ANDERSON: Well, I mean, --

CHAIR BEACH: -- adjourn the meeting?

MEMBER ANDERSON: -- if you want, as a starting point, you could have what -- because of the identify differences between the two --

CHAIR BEACH: Okay. Wait, wait, wait, Andy, where are you reading from? On --

MEMBER ANDERSON: On the last page of Joe's, sort of, where he says the work group's proposed conclusion is, which he took out of your slide 15.

CHAIR BEACH: Yes, okay.

MEMBER ANDERSON: Let's -- and we can just use that as a starting point tomorrow, if you want to say, here's a brief summary that had -- I mean, we'll have to flesh it out more, I think but -- but if you need to have something, I think we need to give a little basis and say not that this is what we're proposing, but we're not going to tell you anything about it.

CHAIR BEACH: Yeah.

MEMBER ANDERSON: So, I would say, because of your identifying differences between the two periods --

MEMBER KOTELCHUCK: Yeah.

MEMBER ANDERSON: -- residual versus D&D era, there is --

MEMBER KOTELCHUCK: Yeah.

MEMBER ANDERSON: -- insufficient basis to conclude that radiological data from D&D efforts, including pre D&D surveys, are sufficiently informative about exposures arising during the entirety of the M&C residual period to be applied in the manner proposed by NIOSH.

CHAIR BEACH: Yep. And that is in my presentation for tomorrow as well, --

MEMBER ANDERSON: Okay.

CHAIR BEACH: -- and it was in the August -- it was in my August presentation --

MEMBER ANDERSON: Yeah.

CHAIR BEACH: -- last summer, so --

MEMBER ANDERSON: (Indiscernible) --

CHAIR BEACH: Yep. I think we're good.

MEMBER ANDERSON: -- there's more to it than that. I mean, we need to --

CHAIR BEACH: Yeah.

MEMBER ANDERSON: -- with the Mound data. I mean, we need to really flesh out points --

CHAIR BEACH: Yep.

MEMBER ANDERSON: -- the Board can say, You're saying this, here's what NIOSH said, and here's what SC&A said, and this is why you --

CHAIR BEACH: Absolutely, yes. It will be fine -- it'll have to be fine-tuned for April. When we go forward with an SEC, all the materials from the work group is available. I -- it is our job to fine tune it and give the reasons and then go from there. So, agreed. Thank you.

MEMBER ANDERSON: I mean, --

CHAIR BEACH: Yeah.

MEMBER ANDERSON: I mean, there's so much there, we can't just say, well, here's everything we did, take a look at it. That -- I mean, we've spent seven -- seven years and multiple meetings and white papers that we really need to cut it down to, you know, here -- here are the key things we want you to spend some time looking at.

CHAIR BEACH: Yep, I agree.

MEMBER ANDERSON: Okay.

CHAIR BEACH: Thank you. Thank you.

Rashaun, anything else?

DR. ROBERTS: I don't have anything.

CHAIR BEACH: Can we adjourn --

MEMBER ANDERSON: Have we met --

CHAIR BEACH: -- then?

MEMBER ANDERSON: -- our legal -- talk to her attorney there. Are we okay? Are you comfortable with it?

MR. RAFKEY: I think that's okay for now. I mean, the important thing is what goes to the Board, I guess, it'll be in April, --

MEMBER ANDERSON: Yeah, right.

MR. RAFKEY: -- to be as complete and fleshed out as possible so they have all --

MEMBER KOTELCHUCK: Absolutely.

MR. RAFKEY: -- scientific, technical information, --

MEMBER KOTELCHUCK: Yeah.

MR. RAFKEY: -- defined class --

CHAIR BEACH: Yeah. And I appreciate that. We'll -- we'll --

MEMBER ANDERSON: And what I would ask, while we got Brant's stuff yesterday at five o'clock, we need to have our presentation and anything that NIOSH is going to present to the Board prepared a --

DR. ROBERTS: In advance.

MEMBER ANDERSON: -- two weeks in advance.

CHAIR BEACH: Agreed.

MR. CALHOUN: Don't forget that we got SC&As the day before Thanksgiving.

MR. RUTHERFORD: Exactly.

CHAIR BEACH: Well, it's --

MR. RUTHERFORD: (Indiscernible) fair -- all right. We did the best we could.

CHAIR BEACH: No, that's --

MEMBER ANDERSON: Yeah, I -- I know. But I'm just saying because I think we've been through this time and again, not just with this committee, but with others, that everything comes in at the last minute, and that's -- I don't want to have something coming in at the last minute for the Board to have to try to sort through it. So, let's be sure what they're going to see is something they can then have vetted before we come to the meeting in April or we're --

CHAIR BEACH: Yeah.

MEMBER ANDERSON: -- going to spend two days, and I -- I don't want to have it tabled at the meeting --

CHAIR BEACH: Yeah, I agree, Andy. You're correct.

MEMBER ANDERSON: -- after seven years. It's time to move it on, one way or the other.

CHAIR BEACH: Agreed. And I think NIOSH and SC&A can appreciate that direction, I believe, you just gave -- so, thank you -- that we need to make the points and -- and let the Board have the discussion, much like today.

Okay. So, I -- do I hear a recommendation or motion to adjourn?

MEMBER KOTELCHUCK: So, moved.

CHAIR BEACH: All right. I second it, if we need that, and we are -- we're done. Thank you. Good work.

(Whereupon, the meeting was adjourned at 4:42 p.m. EST.)