THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

BLOCKSON CHEMICAL

The verbatim transcript of the Working Group Meeting of the Advisory Board on Radiation and Worker Health held in St. Louis, Missouri on June 24 and 25, 2008.

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C O N T E N T S

June 24, 2008

WELCOME AND OPENING COMMENTS DR. CHRISTINE BRANCHE, NIOSH	6
INTRODUCTION BY CHAIR MS. WANDA MUNN	11
BUILDING 40	11
AIRBORNE CONTAMINATION	15
WESTERN PHOSPHATE PLANTS IN IDAHO	58
URANIUM COWORKER MODEL	60
CHAIR'S REQUEST	79

June 25, 2008

WELCOME AND OPENING COMMENTS DR. CHRISTINE BRANCHE, NIOSH	94
RESULTS FROM PREVIOUS TECHNICAL MEETING	98
COURT REPORTER'S CERTIFICATE	109

TRANSCRIPT LEGEND

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In the following transcript: a dash (--) indicates an unintentional or purposeful interruption of a sentence. An ellipsis (. . .) indicates halting speech or an unfinished sentence in dialogue or omission(s) of word(s) when reading written material.

-- (sic) denotes an incorrect usage or pronunciation of a word which is transcribed in its original form as reported.

-- (phonetically) indicates a phonetic spelling of the word if no confirmation of the correct spelling is available.

-- "uh-huh" represents an affirmative response, and "uh-uh" represents a negative response.

-- "*" denotes a spelling based on phonetics, without reference available.

-- (inaudible)/ (unintelligible) signifies speaker failure, usually failure to use a microphone.

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JUNE 24, 2008

P R O C E E D I N G S

(4:45 p.m.)

WELCOME AND OPENING COMMENTS

DR. BRANCHE: We'll get started now. It is roughly 4:45 on Tuesday, June 24th, and this is the Blockson workgroup meeting. I would ask that Advisory Board members who are in the -- I guess everybody's -- Advisory Board members, please announce your names.

MS. MUNN: Wanda Munn, chair of the Blockson group.

MR. CLAWSON: Brad Clawson, member of the Advisory Board.

DR. ROESSLER: Gen Roessler, Advisory Board and working group.

MR. GIBSON: Mike Gibson, Advisory Board.

MR. GRIFFON: And Mark Griffon, Advisory Board, not on the working group, but interested.

MS. MUNN: Here by request.

MS. BEACH: Josie Beach, member of the Advisory Board.

DR. BRANCHE: Actually, Josie, you are going to have to leave 'cause you make seven and that will be a quorum.

MS. BEACH: Okay.

DR. BRANCHE: Thank you. Right? One, two, three, four, five, six.

MS. MUNN: Six.

DR. BRANCHE: No, Josie, I've -- I counted wrong. One, two --

MS. MUNN: Unless Dr. Melius comes on line.

DR. BRANCHE: -- three, four, five, six. You're okay.

MS. MUNN: If Dr. Melius comes on line, then --

DR. BRANCHE: Dr. Melius, are you on the line?

(No response)

Okay. NIOSH staff in the room, please announce your names and say if you have a conflict for Blockson, please.

MR. ELLIOTT: Larry Elliott, no conflict.

DR. NETON: Jim Neton, no conflict.

DR. BRANCHE: SC&S -- S -- sorry, NIOSH staff by phone please state your names and state whether or not you have a conflict for Blockson.

MR. TOMES: Tom Tomes, no conflict.

DR. BRANCHE: ORAU staff participating by phone please state your names and tell us if you have a conflict for Blockson.

(No response)

SC&A staff in the room, please state your names and tell us if you have a conflict for -- for Blockson.

DR. MAURO: John Mauro, no conflict.

MR. PHILLIPS: Chick Phillips, no conflict.

DR. MAKHIJANI: Arjun Makhijani, no conflict.

MR. MARSCHKE: Steve Marschke, no conflict.

DR. BRANCHE: SC&A staff participating by phone, please state your names and whether or not you have a conflict for Blockson.

(No response)

Other federal agency staff, please state your names and please come to the microphone if you're in the room, and tell us if you have a conflict for Blockson.

MR. BROEHM: Jason Broehm, CDC, no conflict on Blockson.

MR. MCGOLERICK: Robert McGolerick, HHS, no comment -- I mean no conflict.

DR. BRANCHE: You can't hide.

MR. KOTSCH: Jeff Kotsch with Labor. I'm not conflicted anyway, so...

DR. BRANCHE: Other federal agency staff participating by phone, please state your names and whether or not you have a conflict with

Blockson.

(No response)

Just so that you know, anyone else who's in the room, I'm going to be calling out certain categories and I will ask you to come to the microphone. Petition--

MS. MUNN: I don't -- I don't believe Bob was here at the time that we were identifying --

DR. BRANCHE: State your name and whether or not you have a conflict for Blockson, please.

DR. ANIGSTEIN: Bob Anigstein, SC&A, no conflict for Blockson.

DR. BRANCHE: Thank you. Petitioners or their representatives in the room please state your names.

(No response)

Petitioners or their reps by phone please state your names.

(No response)

Workers or their reps in the room please state your names.

(No response)

Workers or their reps by phone.

(No response)

Members of Congress or their representatives in

the room.

MR. STEPHAN: Robert Stephan, Senator Obama.

DR. BRANCHE: And by phone?

(No response)

Chia-Chia, your name and --

MS. CHANG: All right, I'm not a worker or representative, but I work for NIOSH, Chia-Chia Chang, no conflict.

DR. BRANCHE: Thank you. Others who would like to mention their names in the room.

(No response)

And by phone?

(No response)

Emily Howell, HHS, has entered the room. Participants by phone, I do ask that you mute your line. If you do not have a mute button then please dial star-6, and when you are ready to speak then you may un-mute your line and if you do not have a mute button then dial star-6 to un-mute your phone. It is critical that all participants by phone mute their phones until they are ready to speak. And please do not put us on hold if you must leave the phone. It is better for you to hang up than to put us on mute. Thank you for your observing telephone

courtesy.

Ms. Munn.

INTRODUCTION BY CHAIR

MS. MUNN: Thank you, Dr. Branche. All of the members of the workgroup I'm sure have my e-mail of the 8th where I listed for you the two items with which we went into our June 5th meeting, and the four items with which we came out of our June 5th meeting. I sincerely hope we can do better than that this time. It's unfortunate to go in with two and come out with four.

I expect to go down the action items one at a time, as per the list that I provided you at that time, and will expect the lead person who is responsible for the questions that were raised at that time to simply give us a quick response to what has been done to accomplish these three -- four items, actually five in all -- that we have gone through.

BUILDING 40

The first is to communicate further with the workers, attempting to determine any existing data, whether any changes took place in the process or production levels or production

levels in Building 40 during the period under consideration. Tom Tomes had the lead for that, and Tom, would you like to respond to the request for information?

MR. TOMES: Yes, we've interviewed three more former workers. Two of them have -- actually all three of them have either talked to or they attended the meetings in Joliet, and we asked more specific questions in lieu of the last meeting, specific-- specifically on Building 40 and the type of ventilation that may have existed, the size of the building, just various process information that may give us a handle on the -- the building that existed in the '50s and then thereafter. And we have found that they made some ventilation changes to the building. Basically they list improvements to some fans and some additional vents to the tanks, digester tanks. That is the only improvements that we've heard of. They were -- there were no major changes other than that that we knew of. Those seem to be relatively minor compared to the overall flow of air through the building. And I (unintelligible) some of those calls, as well as SC&A. I can

expand if there's any questions on that.

MS. MUNN: With respect to the process and production levels, would you --

MR. TOMES: We have no numbers from the workers, but all the workers seem to be of the consensus that the production increased with time. And we do have -- we do have information that they added process equipment. They added a -- an additional digestion line in Building 40. Since -- from the -- sometime after the early '50s they also added an additional grinder for the -- for the crushing of the phosphate rock. Originally -- per one of the workers, originally when he started to work there in 1951 they had two large grinders and one small one. And sometime after he started work there -- a few years, don't know the exact year but a few years after he started, they had a third large grinder. And another worker indicated that they had two digesting lines, each one of -- each line (unintelligible) four digester tanks in series, and they added a third -- that's -- that's his recollection of it, an additional digestion line added, so that would make basically twelve digester tanks,

total. So that -- that was basically -- was -- was the indication that they had increased production, based on the workers' -- said they -- they had improved the ventilation to some degree, they had more capacity. In the workers' opinion -- in at least one of the workers' opinion, they -- the changes resulted in basically the same amount of fumes 'cause the one worker was -- in particular was speaking of the amount of fumes that were in the building. And with that that we have on the production of uranium indicates that from '52 to '60 the production levels were relatively flat. And some of the -- some of the changes in production capacity seem to have occurred in the early '60s, which we have no production data at that time.

MS. MUNN: As I recall from my participation in those calls, although the production levels increased over time to a fairly stable level, they all three agreed that there had been no change in the process itself. They had added to the capability, but not to the process. Was that your understanding?

MR. TOMES: Yes. All three workers that we

have talked to indicated that there was no process changes whatsoever.

MS. MUNN: We have a question from Mr. Stephan.

MR. STEPHAN: Yeah, can you clarify for me, how does testimony from these three workers jive with the testimony of the workers previously?

MR. TOMES: It -- it's consistent. The main difference is the questions this time were focused on different issues, but I -- I -- other than some minor details of when -- times in which -- which things occurred, the comments were consistent with information we had obtained before, just different -- different specific questions being asked.

MS. MUNN: Yes, we didn't hear anything that conflicted with any of the testimony that we heard at the workers' groups with respect to the process.

AIRBORNE CONTAMINATION

Question number two was calculate what kind of venting could result in a factor of five reduction in airborne contamination. There had been some com-- some comment with respect to differences in calculation that had been made. Who's going to respond to that?

MR. PHILLIPS: Tom, did -- I think -- I think that was with you first, and I can follow up on that. This is Chick Phillips.

MR. TOMES: Okay, I can -- I can make a comment on that. We've done some calculations and some basic calculations on -- on the air flow, and the air flow for a pro-- for a -- for a ongoing process such as the production of the rock through the facility, the process did not change. And if we assume that the ventilation did not change, it would take -- excuse me, if we assume that the ventilation system did not change, in other words, we had a static process, it would take roughly five -- an increase of five in the airflow to result in a decrease of five -- a five-factor decrease in the radon concentrations, just a -- just a -- inverse proportion.

MS. MUNN: Chick?

MR. PHILLIPS: Wanda, Tom and I collaborated on in doin-- and we did a little further work on it, and I have the results of that here if it would be appropriate at this time to discuss that.

MS. MUNN: It would certainly be appropriate to

discuss it. Members, and all you within the sound of my voice, this document has not been PA cleared and it may not leave the table where we're looking at it here. But for purposes of this discussion, since it does not impinge directly upon individual cases and dose reconstructions, we will discuss it. Please, Chick, it's all yours.

MR. PHILLIPS: I might add that this document has not been Privacy Act cleared so it's -- it's a working document, but --

MS. MUNN: We're aware.

MR. PHILLIPS: -- (unintelligible).

MS. MUNN: Uh-huh.

MR. PHILLIPS: What -- what you have before you here -- and again, Tom and I collaborated on this, but there are programs available where you can model or estimate the radon concentrations in a enclosed space, a building, whatever, given the radon input rate, the ventilation rate, and the size of the building. And we were able to do this because one of the workers that we interviewed in this latest round gave us some estimates of the size of the building, which we did not have before. So

there are program -- the program is referenced here in paragraph number one. It's an on-line program available to -- to model these. There are two programs available there. The first one will allow you to generate -- using a process to generate the input rate of radon into a building. And I have given you the input values there where you use simply the concentration of uranium in the ore, the feed rate of the ore which comes from the site profile documents is 6,000 tons per week, and then you have to input a release fraction. The release fraction is simply that amount of the radon that's available, based on the radium content of the ore, the fractions that -- that it will be released by the process into the building. And the processes we're talking about here in Building 40 were, first of all, a grinding process which Tom referred to earlier, and then secondly the digestion process where you mix the sulfuric acid with the phosphate ore and thus generate the phosphoric acid with the waste product of the gypsum. So those are the processes.

I used the estimate of the building size based

on the worker interview, and the release fraction that I used in the run that you see in Table 1 was a -- was 30 percent, .3 -- and this is a common value that's used as a radon release fraction in stable soils. If you have a soil -- the earth -- how much of the radon that's available in the matrix of the -- of the earth is available for release.

And when I ran that in a -- I ran it using various ventilation rates, which is what we had been asked to do. The ventilation rates that we chose to use were one turnover -- air turnover per hour, two and a half turnover hour -- per hour, and five per hour.

The reason that we used those values is there's a reference it gives based on the building age and other things, the range of ventilation rates that you can expect. We chose the one for an older building in this particular case. This reference is used to estimate the heating and cooling necessary for a building. So I ran the program to estimate the radon concentrations in the building based on the ventilation rates that you see in Table 1, which are one, two and a half, and five.

The resulting radon concentrations are shown with the one per hour at 7.5, three, and 1.5. Again, what we're trying to do is get a scoping value here. You know, what kind of ranges of radon can you see, what was the ventilation rate how to do that, and other factors.

And you can -- for a reference in these -- this particular case, in OTIB-0043, you remember the bounding value was 2.33 picocuries per liter of radon, so you can see that in relationship to the calculated radon concentrations by running this model.

Going back to -- one turnover per hour is about what you would expect in a older home, before modern day energy conservation. So I would think that, you know, you would expect -- because of the forced ventilation and other things that were going on in a building this size -- it's certainly greater than that. So I gave a range here just to give us scoping value for that.

For a constant input of radon, we can see that the rate relationship to the ventilation rate, as Tom just said, is essentially linear, but inverse linear. In other words, if you double

the ventilation rate, the radon concentration is a half. You'll note that the working level in this particular case is also in that same relationship. That would not be exactly true, because as the ventilation rate increases, the equilibrium fraction between the radon -- the radon and its daughters actually decreases. But I held that constant at a .4 value because that's what's recommended and what we've been using in all the documents. So --

MS. MUNN: And conservative, yeah.

MR. PHILLIPS: Yes. So given that, the other unknown here of course is what is the release fraction; that is, how much radon is released from the ore as we go through the two processes that we discussed before. What I did again is, in order to give a range here and a scoping value, I took the input values -- that is, the radon input value, the size of the building, and varied the release fraction, and the results are shown in Table 2. And you can see the range of radon values there again showing the working levels below that. And then for reference I've compared in the last two rows the ratio of the bounding values given in OTIB-

0043. And then if you remember at the last meeting, SC&A looked again at the -- the lognormal fit on the data that was contained in OTIB-0043. We came up with different values and I've included that for reference.

MS. MUNN: Thank you, Chick. Mr. Griffon, you were the person who had the most concern with respect to radon doses. Do you have any remaining problems with the radon issue, given what we have here?

MR. GRIFFON: Based on -- based on my allowed four-second review, I suppose everything's peachy.

MS. MUNN: I thought you had --

MR. GRIFFON: I mean I just got this document. I wasn't --

MS. MUNN: I thought you had it before we started.

MR. GRIFFON: -- in on any of the technical calls. I'm a little bit blind-sided by this, quite frankly, but you know, you -- you can play with these parameters a lot and, you know, one initial concern I have is, you know, this -- I -- I'm not surprised this is a huge building, but I also wonder about concentration

gradings throughout the building and if the -- you know, if it makes sense to model this based on the full volume of this huge facility, or narrowing that to -- to more represent the workers' space. I'm not sure about that. But that's just an initial question or observation I would have, and I'm not even sure about the through-put numbers where they -- I -- I understand they came from the site profile, but again, I haven't reviewed all that. Jim has a response to my first (unintelligible).

DR. NETON: Well, I just -- just would point out that, if you recall, we did have numbers for working levels in the building in 1982 or 3, I don't know which year.

MS. MUNN: I think it was '82 or 3.

DR. NETON: And those levels were not inconsistent -- well, actually a factor of five lower than what our bounding value was. And -- and my recollection, although Chick and Tom have done a great job modeling the radon concentrations from first principles, basically, was that we were to determine what would it take to reduce -- how much -- you know, was the ventilation increased or not in

the buildings between 1953 and '83 or whatever --

MR. GRIFFON: Yeah, that was that question --

DR. NETON: -- and -- and if they -- if they were, what would it take to -- to reduce them down by a factor of five. And I think this analysis clearly shows that it's a -- it's a direct proportionate relationship so that it would take a -- a factor of five increase in the ventilation rate in the building between 1953 and '82 or '83 to reduce the levels below where we are bounding them in 1953. And I think that's a -- given what we've heard from the workers, almost an incredible scenario that you could imagine increasing a building ventilation by a factor of five. I mean that's a huge increase in the air turnover in a building.

MR. PHILLIPS: And the other offsetting factor is that the workers agreed that there was a increase in production rate --

DR. NETON: Right.

MR. PHILLIPS: -- so the input rate of ore here is based on the input rate during the 1950 time frame, as opposed to the 1983 time frame.

DR. NETON: And I think, in my mind, what this --

MR. GRIFFON: And the material it produ-- I mean there was production going on in 1983 --

DR. NETON: Yes, there was.

MR. GRIFFON: -- I think that was one of our questions.

DR. NETON: Yeah, we asked the workers, and there was production going on. I don't think anyone disputes that at this point. So in my mind, these -- these source term calculations essentially validate that we're -- you know, we're in the ball park and that an upper limit can be ascribed to the radon concentration in the building. You know, whether -- whether one goes with the working level values that we have from '83 and extrapolating them into the '50s, or relying on some bounding value, there are approaches to doing this.

DR. MAURO: Mar-- this is John Mauro. Mark, during the interviews I had the same thought you did regarding the model that they just described assumes uniform mixing throughout this fairly large volume of building, and there's certainly good reason to believe that,

you know, you're not going to get instantaneous uniform mixing. For example, we understand that the crusher and grinder was located in one se-- end of the building and -- on -- on the first level, and -- and that's where most of the what I would imagine -- when you're crushing the rock down to this fine powder and then moving the powder out, I mean there's where one intuitively would believe that's where the radon's generating. So one of the -- and so I had in my mind well, okay, fine, you've come up with a bounding average concentration in the building, given that size, given the through-put rate, and given the radon emanation rate. So I asked the wor-- one of the workers, I said well, listen, how many workers were in the building at any given time, and he said six, seven, ten, like that. And whether they worked -- they all sort of stay in their same location. In other words, it was always one person located here and he was always there -- is no, no, they generally roamed around quite a bit. So on that basis, sort of said okay, that -- not that there wouldn't be a variability, there would be some

variability. I mean intuitively you would believe there would be some variability. But since the workers were moving around, sometimes they're in a higher place, sometimes they're in a lower place, so --

MR. GRIFFON: Well --

DR. MAURO: -- assuming avera--

MR. GRIFFON: -- rafters there's probably not as much -- I mean --

DR. MAURO: Pardon me?

MR. GRIFFON: -- you've got 45-foot ceilings.

DR. MAURO: Yeah.

MR. GRIFFON: I'm not sure they were doing a lot of work up in the rafters.

DR. MAURO: Well, it turns out I think the -- what do you call it was on the second level, the digester was on the second level --

MR. GRIFFON: So it was like a --

DR. MAURO: -- and the grinder was on the first le-- but -- but I -- I can't say to the level of specificity, but it -- it wasn't as other sites where we had workers that had a station where this is where they were eight hours a day every day for years. This sounds like it was -- now certainly -- I mean that was at least one

-- one worker's response to my question, in anticipation of this concern.

MR. GRIFFON: Right, right.

DR. NETON: I'd also say, given the ventilation rates, that the equilibrium comes into play fairly quickly, I would suspect. I mean you could plot that. But these are fairly large turnovers. When you turn over a building once per hour, all the air in a building, I don't think you're going to have that big of a gradient.

MS. MUNN: During our deliberations I thought I heard someone come on line. Did someone join us by phone?

(No response)

All right, perhaps they were leaving instead.

MR. GRIFFON: Well, again, what -- what do you want me to say, Wanda? I mean I'm --

MS. MUNN: Well, I just want to --

MR. GRIFFON: -- My initial observations, but I feel like I need a little more time. I'm -- I haven't -- I'm not familiar with this tool on the web site. I just logged on during the break before this workgroup meeting. You know, I'm -- I'm trying to understand how it takes

production rate versus -- I -- I mean I'm -- I'm trying to visualize this model, too. Does it account for the amount of source term in that building at any one time, I -- I'm just not familiar with this model. If it's just looking at through-put, I mean my understanding, my little understanding of the process is that it -- when it went into the grinding and then to the chemical processing, so you know, it -- there's -- it's -- it's not in -- it's not processed and then right out the door. It's not 35 tons per hour goes into the grinder and then leaves the --

DR. NETON: I guess I would not focus so much on this analytical model as opposed to the -- the 1982 measurements that we have --

MR. GRIFFON: Well, --

DR. NETON: -- and are those valid --

MR. GRIFFON: -- first we heard about that was the last meeting. I mean you weren't --

DR. NETON: Well, that --

MR. GRIFFON: -- really --

DR. NETON: -- but that was the point of this analysis, Mark, was to take those numbers and say what ventilation rate would it need --

would need to happen to make those numbers not representative of the work that went on in 1952. And I think we've clearly demonstrated it would have to take a fairly substantial ventilation rate that none of the workers that we've interviewed have talked about. I think that's the -- that's the central issue. I wouldn't get distracted -- distracted by this source term analysis model. I think that's just another sort of bounding validation that was done to demonstrate that these are in the right order, because your other concern was that they seemed awfully low to you.

MR. GRIFFON: Yeah, and I still --

DR. NETON: And I think, based on these source term models -- which should be low because of the turnover rates and the fractions from these -- you know, these -- these materials.

MR. PHILLIPS: It's -- it's just a simple model. It takes a box. It looks at --

MR. GRIFFON: Right.

MR. PHILLIPS: -- the input rate and the output rate, the ventilation -- the input rate as radon in picocuries per second. It looks at the output rate, turnovers per hour. And it

looks at what the concentration in this box is. It's a very simple --

MR. GRIFFON: Yeah, and I can --

MR. PHILLIPS: -- scoping model.

MR. GRIFFON: -- parameters -- I can adjust these parameters to make it come out pretty close to the 1983 values, too. But I can also -- you know, you -- you -- these -- some of these are pretty sensitive. You change the -- change the volume a little bit -- I mean --

DR. NETON: I don't think so, Mark.

MR. GRIFFON: -- (unintelligible) to 30 feet instead of 45 --

DR. NETON: He's changed the ventilation rate by a factor of five. He's changed the release fraction by a factor of five. And you could change the building volume, but I don't think you can increase it by a factor of five. I mean it probably is in the right ball park on the vent-- those are the only factors that go into the calculation. I mean he's shown you --

MR. GIBSON: You mentioned fan changes, what changes were made to the fans?

DR. NETON: Tom? Tom talked to the workers but I didn't, but...

MR. GIBSON: Or could you tell me if you changed out a fan motor and it had a difference of 1800 rpms, how much would that make to the ventilation flow?

MR. TOMES: I don't have the numbers on the changes, but they -- they upgraded the -- the fans. One of the workers said they upgr-- they did -- when they did some upgrades they upgraded the fans.

MR. GIBSON: And so if that -- an upgrade could just mean a new fan motor. If you had a -- an rpm difference of 1800 rpms lower, what would that do to the ventilation?

MR. TOMES: I -- I don't have any quantities to -- to bear on -- on it -- on what the -- the worker said.

MR. STEPHAN: Following up on that question, so we just know that there was a change, we don't know what the change was? Or he -- or you just don't have the data in front of you? Trying to clarify what you meant from the very beginning.

MR. TOMES: They men-- let me pull my notes out so I can be a little more precise here.

MS. MUNN: One of the workers did comment that the fumes that they dealt with were pretty

noxious for the workers in that building, and that at some juncture -- he could not remember when -- there was -- there were wooden hoods added over the open tanks where the acid mixture was being circulated, and that those hoods helped eliminate some of the really acrid fumes that they had to -- had to work in most of the time, but did not seem to appear to have changed any of the other working conditions very much, as I recall what the worker said. Is that your memory, Chick -- Tom?

MR. TOMES: I -- one of the gentlemen said they installed new fans and exhausts, and -- and this is verified by another worker in a little bit less detail, and -- and they described that the digesters, at some point during the upgrade they added these plenums or cone-shaped devices over top of the digesters, which I assume were designed to draw the fumes away from a breathing zone where a worker could have been located. There was no -- and as far as new fans, I have -- I have no information other than they upgra-- installed new fans. There was no indication that they -- that there was any other upgrade other than that.

DR. MAURO: This is John Mauro. When I was thinking about this problem I was -- I understand that the questions regarding fan capacity, fan design -- but I try to say how would I -- it's really air turnover rate. In other words, ultimately you're concerned with how many air turnover rates per hour. That's the controlling factor. Quite frankly, the equation is extremely simple. It's the number of curies per second entering this room -- if you know the curies per second entering this room, and we can put an upper bound on that by saying well, the number of curies per second of radium that's moving through the process, that's the number of curies per second entering this room -- and you divide that by the air turnover rate, one per hour, two per hour, three per hour, and that gives you your concentration and the volume of the room. In fact, you could -- it's a hand calculation. I did it by hand before we did it by computer program.

The important question that really troubled me was the air turnover rate. I -- I -- initially when I did my first scoping, I said I'm going

to go with one air turnover per hour because that's the turnover in a -- in a -- in a structure that really does not have a forced ventilation. It's just like air blowing over a house and that -- from radon, turnover. But I -- so I said to myself this is a big building and -- and that rule of thumb may not work. So I called up Mort Lipman, my professor of industrial hygiene 20 years ago who wrote the book on building ventilation and air turnover, industrial hygiene, and he was there at NYU and he -- I said is it okay if I use your name at this meeting; he said sure. I said in your opinion, for an industrial building that let's say was built in the '40s and operated in the '50s, what's -- would one air turnover rate per hour represent a reasonable estimate of the turnover rate for air in a building like this. And he goes absolutely lowest possible work-- value you could imagine, he said. It's got to be higher than that. But if you wanted to place an upper bound, he says sure, go with one per hour, but I'm sure, if you really have the real information, it's going to be higher than one per hour. And then subsequent to that

conversation is when we found this other document that spoke in terms of two to three to four air turnovers per hour as being more or less reasonable for buildings of this vintage. And basically it's a building that has a -- a box like this, it's got fans in the ceiling that are exhausting air, and maybe a window that either might be open or closed that would have the replacement air, and that's the way Dr. Lipman -- his perspective was. So -- and then later when we saw these numbers of two to three to four air turnovers per hour in this separate document, I start to come -- converge. I say hmm, it looks to me that one air turnover per hour not-- is -- is certainly the -- the lowest air turnover one might reasonably assume. And on that basis -- in fact if you would go one air turnover per hour, you go with the curie per second number for the through-put and assume a hundred percent of the radon, we basically could place an upper bound on a max concentration, and what did that number come out to be? Other words, assuming just one air turnover per hour, hundred percent of the radon is coming into that building and the building

is the approximate sizes mentioned by the fella we interviewed --

MR. PHILLIPS: It's not in here, but it'd be 25.

DR. MAURO: So -- so I -- I mean I right now walk away with the sense that it doesn't seem to be possible that it could be much higher than 25 picocuries or -- per -- you have another perspective sure?

DR. ANIGSTEIN: Yeah.

DR. MAURO: Go ahead.

DR. ANIGSTEIN: If -- I -- no, the only thing I -- I have a comment on, as you said, radium through-put. I would say radium inventory in the room at any one time --

DR. MAURO: Well, it --

DR. ANIGSTEIN: -- because it's not the radium through-put that determines the radon generation.

DR. MAURO: Uh-huh.

DR. ANIGSTEIN: It's always going to be -- the radon is going to be in equilibrium with the radium --

DR. MAURO: Right.

DR. ANIGSTEIN: -- that's in there.

DR. MAURO: Right.

DR. ANIGSTEIN: So whatever is the radium -- you know, maybe the -- the through-put is small, but a large inventory --

DR. NETON: Right --

DR. ANIGSTEIN: -- the inventory is --

DR. NETON: -- it's the average amount there during any given time, but then -- but then given the production rate for the year, that would average out -- radon -- I mean --

DR. MAURO: Yeah -- yeah, the -- basically I'm saying there -- there were so many tons per day of -- of ore moving through the system, which is a certain number of curies per day --

DR. ANIGSTEIN: Because you could have the radium --

DR. MAURO: -- and all that radon's coming in.

DR. ANIGSTEIN: But wait, wait a second. You could have zero through-put and st-- and an inventory.

DR. MAURO: Okay.

DR. ANIGSTEIN: So you could have that, and you could have at the same time a very -- you know, a railroad train going through (unintelligible) --

DR. NETON: But -- but if you know the total -- total through-put for the year, it's got to balance out on -- because you could have zero there at one point, you'd have twice as much one week --

DR. ANIGSTEIN: I don't get it. Through-put -- they're two different things. Inventory and through-put are two separate --

DR. NETON: But the radon concentration is proportional to the amount of radium in the building, is it not?

DR. ANIGSTEIN: Exactly, yes.

DR. NETON: And if we know how much was there in any given year, if you put it all there for one week and then put nothing there for 52 weeks --

DR. ANIGSTEIN: But it -- but the question is how long does it reside in the building.

MR. PHILLIPS: It -- it's constantly --

DR. ANIGSTEIN: (Unintelligible) the issue.

MR. PHILLIPS: -- the ore is constantly flowing through. The ore comes --

DR. MAURO: It's moving through.

MR. PHILLIPS: The ore comes in --

DR. MAKHIJANI: I know, it's moving through.

MR. PHILLIPS: The ore comes in, it's crushed, it goes to the digester, and then the phosphoric acid goes out the other -- you've got a constant input.

DR. ANIGSTEIN: But it's the time from it enters the front door to the time it leaves the back door.

DR. NETON: But there's always new stuff coming in the front door.

DR. ANIGSTEIN: No, no, I know --

DR. MAURO: And every atom of ra-- and every ra-- atom that's produced -- that -- in other words, you've got the -- for every atom of radium that's coming in we've got -- for every curie of radium coming in --

DR. ANIGSTEIN: Yeah, I know.

DR. MAURO: -- we've got a curie of radon --

DR. ANIGSTEIN: I --

DR. MAURO: -- and we're putting all this --

DR. ANIGSTEIN: That's understood.

DR. MAURO: -- every curie into the air.

DR. ANIGSTEIN: Yeah, I know.

DR. MAURO: Into the air.

DR. ANIGSTEIN: I understand. But it's still a matter of the residence time in the building

and not the -- unless I'm -- unless I've got a short-circuit in my brain, it's not the rate of production.

MS. MUNN: But that's what the air turnover calculations --

DR. ANIGSTEIN: That's a separate --

MS. MUNN: -- were about.

DR. ANIGSTEIN: No, that's a separate thing.

MS. MUNN: How can it be separate? The radon is in the air.

DR. ANIGSTEIN: No, no -- right, right, I (unintelligible).

MS. MUNN: If the radon is in the air and the air is being turned over, then the radon also is being turned over --

DR. ANIGSTEIN: Yes --

MS. MUNN: -- it's not segregated from the air.

DR. ANIGSTEIN: Yes. No, no, I agree completely. Of course it is.

MR. PHILLIPS: It's the radon release rate per unit time, which has to be proportional to the radium per unit time coming in.

DR. MAKHIJANI: No, that -- I agree with Bob -- is there -- the through-put -- the amount in your bank account, the amount you spend each

month, you have to know the residence time of each production batch. And the radon rate will be proportional to the amount of radium that is in the buil-- resident in the building --

DR. NETON: Right. Right.

DR. MAKHIJANI: -- and not to the rate which it goes through the room.

DR. NETON: Right. Right, right.

DR. MAKHIJANI: So you have -- if you get a batch, you have to know how long that batch stays --

DR. NETON: Right, that's true.

DR. MAKHIJANI: -- in the room.

DR. NETON: That's true, but it's assumed -- right now -- this model assumes a continuous input and output so it's at equilibrium. There's always a constant amount in the room --

DR. MAKHIJANI: But we don't know --

DR. NETON: -- at the time.

DR. MAKHIJANI: -- we don't know what that is.

DR. NETON: I know, I agree, but we know what the annual production rate is --

DR. ANIGSTEIN: That still doesn't -- this is --

DR. NETON: No, no, wait, listen. So you know

-- you know how much went in and came out the other end in a -- in a one-year period because you know production per year. Right? Do we not?

DR. ANIGSTEIN: Yeah.

DR. NETON: Okay. So if you -- if you double the rate at any time, would that not double the radon concentration -- not --

DR. ANIGSTEIN: Look, suppose you just -- just make up some numbers. Suppose they produce one ton a day, and it stays -- it takes one day to produce it, so that means your residence would be at any one time you would have one ton going through. However, you could produce one ton a day, because one -- because, you know, that's what goes out, but it could be a hundred tons in the building at any one time.

DR. MAURO: It's very simple, Bob. What you're saying is all the radon that came into that building to produce -- that was used, stayed in the building. In other words, how many tons per day was -- what was -- what was the through-put? What was --

MR. PHILLIPS: 6,000 tons per week or --

DR. MAURO: All right, 6,000 tons per week is

coming in the door. Okay. Now I would agree with you, if that 6,000 tons per week came in the door, was ground up -- okay? -- into a fine powder and left there, so that not only the radon of the 6,000 tons per week that was -- come -- turns into curies per week of radium coming in, but you're saying it was sitting in the building for --

DR. ANIGSTEIN: But we don't know.

DR. MAURO: But it -- but that --

UNIDENTIFIED: No.

DR. MAURO: -- material wasn't sitting in the building, it was --

DR. ANIGSTEIN: No, I agree.

DR. MAURO: -- leaving the building.

DR. ANIGSTEIN: But let me tell you -- let me -- let me just make up something that, to my mind, I would -- I don't mean to insult anyone by being -- you know, but -- but it just occurs to me, as a -- as a -- a example, if you knew -- there's a Ford factory and you know they produce 10,000 cars a year. Does that necessarily tell you how long one car -- how long it takes to make one car from the time the raw material comes in -- and (unintelligible)

goes back -- and the answer is it does not. You could be -- you could -- you could have a car made -- you know, it could be made in one day, or it could take a hundred days and you could have enough production -- and so you -- you can't know what the inventory in the building is based on the production rate.

DR. MAURO: The radon is decay-- in other words, what you're saying is the radium --

DR. ANIGSTEIN: No, (unintelligible) the radium is not decaying. That's the whole point.

DR. MAURO: I think -- we have an interesting workgroup meeting, but this is just the way (unintelligible).

MR. PHILLIPS: (Unintelligible)

DR. MAURO: The radium has a half-- the half-life of radium is three -- what is it --

DR. MAKHIJANI: 1600 years.

DR. NETON: Yeah, 1600 years.

DR. MAURO: Not the radium, the radon.

DR. NETON: 3.82.

DR. MAURO: 3.82 --

MR. PHILLIPS: 3.82.

DR. MAURO: -- so I would agree with you if that radi-- if that radium was coming in,

processed and then sat there for three, four, five, six -- maybe a week, because then -- then you would have continuous production of more radon growing in.

DR. ANIGSTEIN: Exactly.

DR. MAURO: Okay. Now, is there any reason to believe why these ton-- this -- this enormous tonnage that's moving into this building is going to be sitting there for several weeks?

DR. ANIGSTEIN: I have no idea.

DR. MAURO: All right, and that -- and I would say if that scenario is true, then you're right. But if it turns out that the -- the residence time of the radium in the building that comes in the front door is short compared to the half-life --

DR. ANIGSTEIN: Okay.

DR. MAURO: -- of the radon --

DR. ANIGSTEIN: Yes, exactly.

DR. MAURO: -- and there's the question -- and I could tell you right now that this stuff is moving -- we're talking tons of stuff moving through a building. It's not sitting there for three or four days.

DR. ANIGSTEIN: But I have no idea how -- I

have no idea how long it takes to (unintelligible) --

DR. MAURO: But I mean you -- you would agree with that. In other words, if you could -- in other words, I would agree with your position if you could -- if you would -- said that no, that radium when it came in, it stayed there for several ra-- radon half-lives, so that the radon could continually produce --

DR. ANIGSTEIN: Yeah, right, I was --

DR. MAURO: -- then you'd be right.

DR. ANIGSTEIN: -- I was assuming that.

DR. MAURO: And I think that's -- that's fair. I think --

MR. PHILLIPS: It's -- it's a continuous process.

DR. MAURO: But is -- is it reasonable to assume that -- that the -- that tonnage of material the comes in on day one sits there for several days?

DR. NETON: It's a continuous process.

DR. MAURO: It's a continuous process, the stuff is moving out.

DR. ANIGSTEIN: But it could move slowly. I don't know how long it takes to --

DR. MAURO: Well, fair enough. I mean --
DR. ANIGSTEIN: I don't know how the production is.
DR. MAURO: -- I think -- I think that we're -- we're not disagreeing. And really it becomes a question of what is the residence time of a -- of a ton of ore that comes in the door before it leaves the building.
DR. ANIGSTEIN: We need -- we need Bill Thurber.
DR. MAURO: Okay. And I mean -- and right now -- I mean we -- we have -- there's the question. Unfortunately, Wanda, we still have a question on the table. What is the -- what is the residence time of the ton that comes in the door in the building before it leaves the building, because without -- and I can't imagine it sitting there -- that ton sitting there for a week, but --
DR. ANIGSTEIN: No, I --
DR. MAURO: -- maybe it is.
MS. MUNN: I cannot imagine an employer leaving six to ten workers on the floor in a process building with nothing going out the door. That doesn't --

DR. ANIGSTEIN: (Unintelligible) out the door, I just said it's coming in --

MS. MUNN: And staying.

DR. ANIGSTEIN: -- and it takes a long time to produ-- you know, that there is production, and it goes out. I think the two are completely --

DR. NETON: Well --

DR. ANIGSTEIN: -- as I think Mark said, you know, but how much money you have in the bank and how fast -- and what your income is -- I mean, you know, again, use the bank account. You have a bank account and you could spend it just as fast as -- every -- every paycheck that gets deposited, and it gets spent by the end of the week. Or you can have a very large amount in the bank and you still have your paycheck and your expenditures --

DR. NETON: But -- but Bob, maybe I'm being dense here, but let -- let's take a scenario where, you know, they produce 52 tons per year -- that's convenient because there's 52 weeks in a year.

DR. ANIGSTEIN: Uh-huh.

DR. NETON: This model would assume that one ton per week would move through the building,

continuous flow, you know, input/output, your at equilibrium with one ton per week at any time -- any time in the building there's one ton moving through the building in a week, and you could compute that down per day or whatever. Now if for some reason they would do five tons that would sit in the building for five weeks, you still then -- you would have a -- an increase in the radon -- the average radon concentration in the building has to remain the same over time. You would double the radon concentration because there'd be more in there at any given time, but since you know that you only produce 52 tons a year, you have to drop down the radon concentration at other points because there's less radon going through the building.

DR. ANIGSTEIN: Huh-uh.

DR. NETON: Because radon comes into equilibrium very quickly once it gets (unintelligible).

DR. ANIGSTEIN: I know, but that's a -- that's a (unintelligible) what John was saying it doesn't -- I mean he -- he -- if it doesn't come into equilibrium quickly -- I mean if it

goes through very quickly, then my argument isn't -- isn't precisely correct, but it --

DR. MAURO: It's very simple. If -- if the ton is moving through that building at a rate which is fast compared to --

DR. ANIGSTEIN: Yeah, I hear -- I agree -- I agree with you.

DR. MAURO: -- the half-life of radon --

DR. ANIGSTEIN: I agree with you.

DR. MAURO: -- then -- then we got it right. If it's not, we got it wrong.

DR. ANIGSTEIN: Okay. Okay, I think this is --

DR. MAURO: I think you have to --

DR. ANIGSTEIN: I think -- I think it has to be looked into, in my -- in my opinion.

MS. MUNN: This has deteriorated.

DR. MAURO: Yeah.

DR. ANIGSTEIN: Yeah.

DR. MAURO: You're watching SC&A at work.

MS. MUNN: This is the kind of discussion that we had hoped would go on off-line so that we would not have to do this today. I thought it had gone on. I thought we had this question answered. We have multiple individuals agreeing. We have two individuals not

agreeing. And the answer that's been given to the -- to the question answered the question, but the question's answer is not being accepted. This has become a common thread in our deliberations in Blockson, and it's a disturbing thread. It is bringing our efforts to an unfortunate place. If we cannot agree on one item of this sort without, as I said at the beginning, generating more questions to go out and answer again, and yet again, then we can't do this. And if we can't do this, then we might just as well agree here we can't do this and that's what I will take to the Advisory Board, the fact that we can't do this. I don't want to do that. At this juncture what I'm prepared to do is move forward from this question to address the others to see if there are other questions on which we can't do this. If that's agreeable with everyone else here, we will leave this question and go on to see if we have more than one question that we can't do. Is that all right?

DR. MAURO: I -- I wou-- there's one -- I -- having trouble with this because we're -- it's a weight of evidence argument.

MS. MUNN: Yes, it is.
DR. MAURO: What we have is measurements made in many buildings in Florida. We have measurements made in the 19-- in 1983, both of which tend to argue for us being able to place some value on what the radon concentrations might have been in the 1950s and '60s in this building. Then we have this bounding calculation that we -- that we consider to be bounding, except there's a minority opinion, and that we also agree that the only circumstances under which that bounding calculation won't work is if the residence time of the -- of the ore in the building was many days as opposed to hours.
MR. GRIFFON: That was one parameter and there was a --
MR. GIBSON: Yeah.
DR. MAURO: Now --
MR. GRIFFON: -- I've got other questions --
DR. MAURO: Yeah, but certainly --
MR. GRIFFON: -- (unintelligible) look at it as well.
DR. MAURO: Right, now -- but that -- but that -- that's one parameter. There's also the size

of the building, but I think that, though, the air turno--

MR. GIBSON: There's also changes to the equipment not been answered.

DR. MAURO: No, the -- the -- the air turnover rate I think is --

MR. GIBSON: That's what I'm talking --

DR. MAURO: -- I think it is answered. Other words, I find it impossible to believe that the air turnover rate was less than one per hour, probably a lot higher than that, so I mean my -- me as a -- you know -- listen, it's as if we're working together in a room and we're rolling up our sleeves and we're working the problem out, and we're working it in a public setting, but that's okay --

MR. GRIFFON: Let me --

DR. MAURO: -- the air turnover rate --

MR. GRIFFON: John, let me just say one thing. There is one part that I definitely will agree with Wanda on. I was hoping to have these kind of discussions on a technical phone call and I actually thought I was waiting for an e-mail to say that we're going to interview people. I was waiting for a wrap-up technical phone call.

It never happened, so I mean to get this thing delivered to me today, I feel a little bit -- you know, and then everybody asking me are you okay with this, I mean --

DR. MAURO: Well, it was written --

MR. GRIFFON: -- I just need to look --

DR. MAURO: -- (unintelligible) as yesterday.

MR. GRIFFON: -- at it more. I'm not saying it's wrong, I'm just saying I need to have a little chance to consider it. So I agree, it -- it would have been nice to -- and these kind of discussions are better on a technical phone call where we can just roll up our sleeves, as John said, and -- and talk about it, but I'd -- I -- I wasn't afforded that opportunity, so -- I'll leave it there.

MS. MUNN: Robert?

MR. STEPHAN: Well, Wanda, I just want to pick up on the point that -- that I think you just were making, which is there are several issues that you guys are discussing here tonight. But on this one, SC&A in particular has some disagreement amongst themselves and -- you know, for how long do we carry this out, and I really think this goes to the issue of

timeliness. It goes to the issue of -- of, you know, this is not a long-term academic study, and I don't think anyone ever wanted it to be that. So at what point, speaking for the workers, do we stop and say, you know, enough is enough. We have all of these very educated and bright minds here who can solve many, many, many problems. But for example, on this one issue -- there are others, I think, that there is not agreement on -- at some point in time we have to cut it off, as the Board has done on many other issues. And I think that we are approaching that time with Blockson, and we need to -- we need to vote. I mean it was bewildering to me that the vote would not be in favor, quite honestly, on Blockson -- bewildering -- but regardless, at some time we need to get it to the Board.

And -- and actually I have a slightly different opinion. I think these technical discussions in the public are wonderful and I wish you would do them that way more often. I really do think that they are very beneficial for, you know, the other side, who has a stake in this argument, that those discussions do not just

take place amongst you but that all of us can partake in them. I -- I think actually it's -- it's fascinating, for one, but from a public disclosure point of view I think that it's beneficial to the workers and their advocates, so thank you.

MS. MUNN: Well, Robert, I'll have to make the observation that it's a rare occasion when you can get more than two health physicists in the same room and get an agreement. It's very rare indeed. We've had several instances where we've had a number of health physicists in the same room and they've come to general agreement on most of these questions, only to have someone else say no, I can't accept that -- whether because or not because, I just can't accept that. So we're -- we're doing the best we can here. We're trying to get through this. We're trying to answer each and every question and give every question the same weight, which is what our -- what's slowing us down here.

MR. STEPHAN: Right. Well, I think it's a very fair point and I appreciate the point. You know -- but as we've told the Blockson workers on many occasions, it's to your benefit, for

example, to let this go on another year or however long it's been now, I'm losing track, and let SC&A study it. If consensus can be reached among NIOSH, SC&A and the Board, you know, from a elected official standpoint, you know, that's one thing to relay to -- to claimants, to workers. But when there's not consensus, particularly on an issue like this, you know, that's a whole 'nother point indeed. It makes it certainly much more difficult to go to them and say that there was not consensus and you were voted against. So I mean I appreciate your point very much, your hav-- you know, that it would be odd to have two health physicists disagr-- or agree. But you know, at what point do we cut it off, I guess is the question.

MS. MUNN: It's a valid point -- a valid question.

May we continue with the other outstanding questions?

WESTERN PHOSPHATE PLANTS IN IDAHO

We had been asked to check the western phosphate plants in Idaho to see if there was any relevant process information from them that

might be factored in. It's my understanding that we were unable to identify anything from the Idaho process.

MR. PHILLIPS: No, I -- I never got to anyone who could answer the --

MS. MUNN: So there's no additional information from that source, which would have been input data from another plant in any case.

The fourth item was NIOSH was going to attempt to talk to Mr. Bloom, making contact with --

DR. NETON: Yeah, I did talk to Tom Bloom and he indicated that, although they had considered looking at phosphate plants, the studies that he worked on concentrated only on uranium mills, and they never did follow up on measurements -- at least in his group -- with phosphate plant --

MS. MUNN: She had no --

DR. NETON: -- measurements.

MS. MUNN: -- additional information --

DR. NETON: That's correct.

MS. MUNN: -- nothing to add. As Mark has pointed out, the technical call that we had hoped to put together to discuss this beforehand didn't come to fruition. That may

partly be my fault because I was not timely enough --

DR. BRANCHE: Excuse me -- but Wanda, the report from SC&A which Chick and Tom Tomes worked on only was delivered yesterday.

MS. MUNN: That was only one -- one, though, of the items that we had gone over here.

DR. BRANCHE: Yes.

MS. MUNN: Add to that the fact that yesterday afternoon late I received and relayed to all of you two more questions from Dr. Melius, who is not here today, two possible SC&A assignments for the workgroup to consider -- at this point I do not know if I will be present for the meeting on Tuesday.

URANIUM COWORKER MODEL

First, uranium coworker model appears not to use OTIB-19, perhaps because of when the site profile was completed; what difference does this make to the bounding relative to the missing two years of data? I don't recall if this was ever discussed.

And item two, in the monitoring data one unidentified worker consistently had the highest values. Do we have any information

that would identify this worker's job title? Would the current approach or one based on OTIB-19 bound this worker's estimated dose? It's my understanding Tom has read these questions and has a NIOSH response. Tom, are you there?

MR. TOMES: Yes, I'm here. OTIB-19 was an ORAU document that was written after the orig-- the initial Blockson TBD was produced back a few years ago, so it was not used by ORAU when they did the initial Blockson TBD. The current TBD was written over here at OCAS, and OTIB-19 is not applicable to the way we do business here in our agency. OTIB-19 is mainly a document that has administrative requirements for who -- who does the work, who does the review, who you contact to do what within ORAU's organization. There are some very general technical guidance in that document, and -- but it also stipulated in that document that the subject experts are to review the data and take the appropriate responses to -- to analyzing the data. So there is no really direct -- there is no really direct (unintelligible) in TIB -- that we are not complying with TIB-19 technically. It's

just that the TIB-19 is not really applicable to -- to the personnel here in our agency.

DR. NETON: Yeah, I might clarify briefly that what Tom just said, 'cause I think there might be a little bit of confusion there. The reason it's not applicable is because TIB-19, as he said, is a -- is a prescriptive document -- an administrative document of how one goes about curve-fitting of lognormal distributions. It's merely that, how you -- how you fit the data and how you get the 84th percentile, the 95th percentile, et cetera, and it really is more about the -- the approval process or the review process of how that goes about, who does what part of the data, who reviews it. And within OCAS we're not as large an operation as ORAU so we don't have such a prescriptive process for doing these. Rest assured, though, that we would do lognormal curve fitting in the same manner to pick out the 95th percentile, et cetera. So I -- I don't -- it's hard to understand what -- we don't believe that TIB-19 is really relevant to this discussion.

MS. MUNN: So since OTIB-19 is not really relevant to the discussion, Dr. Melius's

question with respect -- as to whether the high dose report from one worker is bounded by OTIB is a moot point since --

DR. NETON: Well, no, that's a separate question, but --

MR. GRIFFON: But can we stop at the first question first?

MS. MUNN: Yes.

MR. GRIFFON: I mean since I'd brought this up to Dr. Melius, I probably can represent it a little bit. You know, that may be true that's an administrative procedure, but in fact on all these coworker models -- and I -- and I assumed that it was because Blockson was written early, but in all the other models from then on, or most models I've looked at, you -- you consider all the data and you look at the 95th percentile of all the data. In this particular model you look at average intakes by worker and you -- you just -- you did a distribution of average intakes of each worker.

DR. NETON: Right.

MR. GRIFFON: They're not going to be may-- they're maybe not going to be that different. In fact, they're going to be about --

DR. NETON: Well --

MR. GRIFFON: -- 20 or 30 picocuries different 'cause I did the numbers, but -- but it is higher and it would have a higher tail obvious --

DR. NETON: -- in this -- in this particular instance, though, as Tom pointed out, this is not a large dataset. We had the luxury of having multiple samples on -- on a number of individuals, so we took advantage of that to establish a more reasonable assessment of the chronic intake scenario because we actually had the people who were being exposed. I'm going to cite my Y-12 --

MR. GRIFFON: You're also missing the last two years, so --

DR. NETON: Right, but --

MR. GRIFFON: -- you know, I just wondered why -- why a different approach, you know.

DR. NETON: Well, Tom can speak to the two missing years, but the different approach was because we rarely have such a clear-cut dataset of all the available data of the workers who were monitored -- or most of the workers who were monitored.

Tom, you might want to speak to --

MR. GRIFFON: I -- I was -- you know, I was just observing that it was inconsistent with most of the models we're looking at now and would --

DR. NETON: Right, and again, that -- that -- there are --

MR. GRIFFON: And that may not even be an SEC issue, I'm just --

DR. NETON: There are differences. I'd point out the fact the way we did Chapman Valve is different in the fact that we took the highest value because we didn't believe that fitting a lognormal distribution to data that were mostly below the detection limit was appropriate. So you know, we -- we --

MR. GRIFFON: Yeah.

DR. NETON: -- you know, we will make adjustments as appropriate, given the data that's presented to us, and that's what we've done in this case.

I would argue that that's not necessarily a -- a boun-- an issue relevant to an SEC petition anyways.

MR. GRIFFON: It might not be, that's -- I'll

agree with that.

DR. NETON: And you know, I -- we've got to be care-- we have to be mindful that we're trying to determine whether we can plausibly bound these doses at this point and not fine-tune this to the point -- down to the -- you know, the decimal point. I mean can -- can we bound the doses of workers given the data we have available to us.

MR. GRIFFON: I -- it was mostly an observation on my point because it -- it looked like a different way to do it and -- but when I --

DR. NETON: Right, and now that you've --

MR. GRIFFON: -- I ran the numbers the other way, it -- I do get a higher bounding value, but not terrifically higher, either, so --

DR. NETON: Yeah, and again, we've been through this over a year and now to question that approach I guess is sort of late, but we can certainly entertain that. And is it an SEC issue or not? I don't know; I don't think so.

MS. MUNN: But we have a different set of data here that we're working with and --

DR. NETON: Well, yes.

MS. MUNN: Well --

DR. NETON: We believe it's acceptable to use multiple data points on an individual person to -- to fit chronic intakes, yes, 'cause that gives you a better indication what the chronic intake might have been.

MS. MUNN: Are you comfortable with that? I -- I don't want to go away feeling that these -- that Jim's questions weren't answered, especially since --

MR. GRIFFON: Yeah, I'm not --

MS. MUNN: -- he's not here.

MR. GRIFFON: You know, I -- I -- it's a different approach. It --

UNIDENTIFIED: (Off microphone) It's one of the things we brought up (unintelligible).

MS. MUNN: But it's valid.

MR. GRIFFON: -- that particular part of the question on the uranium data is probably a site profile question. You know, the other -- I think the other more pressing issue is -- that Dr. Melius is representing is the, you know, representativeness and the -- and the -- excuse me, in this -- in this case you're not -- often we have -- you know, when we have air sampling data and we are looking at these type of

models, you -- you can sort of be missing the -- the final two years, and as long as you have air data and nothing really changes, then we've sometimes accepted those -- you know, accepted that it could be bounding. In this case you're missing the last two years of urine data --

DR. NETON: But we know the production rates --

MR. GRIFFON: -- (unintelligible) --

DR. NETON: We don't think the production rates changed.

MR. GRIFFON: Right, and I heard that --

MS. MUNN: They -- they said they didn't know.

MR. GRIFFON: -- explanation that -- that probably the peak production -- the samples were taken subsequent to the peak --

DR. NETON: Correct.

MR. GRIFFON: -- production levels so it would only going down from there and -- you know.

DR. NETON: Yeah.

MR. GRIFFON: But I gue-- I -- to me, those would be the two -- and I -- Dr. Melius isn't on the line, I don't think, but to me the representativeness question is the one he's been asking about. And this -- this thing that we discussed -- I would -- I would probably put

it in a site profile question more than a -- you know, it's a matter of what's -- what is that upper bound and how you treat a data --

DR. NETON: Right, exactly. I think that's a fair -- that's a fair observation on your part. But again, we're trying to decide an SEC --

MR. GRIFFON: I -- I agree.

DR. NETON: -- petition here.

MS. MUNN: Well, actually we have two.

DR. NETON: I think some --

MS. MUNN: We have to decide both.

DR. NETON: Well, agreed, but for purposes of immediate at hand, I think the SEC issue is the more pressing at this point.

MS. MUNN: Uh-huh, it is.

DR. MAURO: The second part of the question that Dr. Melius raised regarding this one worker as having this high excr-- excretion rate and possible intake rate, where does he fit into the 82 picocuries per day number? Do we have the --

MR. PHILLIPS: Tom, can you answer that?

MR. TOMES: I -- I canno-- I'm -- I as-- I took the -- the worker who had the highest individual intake -- the data I have -- I

determined an individual intake rate for -- for all the workers, and it was over the period that they were monitored. And there -- there was -- there was one person who did have con-- consistently high results, and I -- I took the person with the highest chronic intake rate and I compared that against the default 95th percentile value in the TBD, which is about nine percent higher than his intake would be if you -- if you calculated wh-- just for him.

DR. MAURO: So --

MR. PHILLIPS: So he was less than the --

DR. MAURO: Okay, so -- so the --

MR. TOMES: That -- that -- the reason for that is the -- the curve, the ranking and the fit of the curve to (unintelligible) points.

DR. MAURO: So the default value that's been adopted -- I believe it was something like 82 picocuries per day --

MR. PHILLIPS: 83.

DR. MAURO: -- envelopes this particular person that was made reference to who was a high end person.

MR. TOMES: That's right.

DR. MAURO: Okay.

MR. GRIFFON: Right, and I -- and I got the same numbers, and I think, Tom, your -- your last statement was the key there, that the -- the fit was different than the -- you know, so -- so you end up getting a -- this person is -- is under the 95th, I got -- I got similar numbers as to what he put in that spreadsheet, so I agree with that.

MR. TOMES: Okay, there are -- there are -- there are obviously some variations you can do on statistics and I -- I tried to choose a method that would result in the highest 95th percentile in the TBD.

MS. MUNN: All right. Thank you, Tom. We've gone through the material that we had expected to cover today. We've heard many voices. We know that we are always going to have one or two people who do not fully embrace the conclusions that other people make. I would hope that we would agree here to be able to have one individual express the position of the agency, one individual express the position of the contractor, and for us as a working group to take those two positions and, from that point, see what we can decide. Is that

reasonable?

MR. CLAWSON: How -- how many times do we always agree, though? This is -- this is what we're put here for is to be able to evaluate through these things and I -- I hope that -- I understand what you're saying, Wanda, but I hope that we also don't stifle anybody's opinion because they're -- through some of this debate an awful lot of information has come out, and I -- I just -- all I'm saying is I don't want this to be stifled because we're trying to recreate something that has been long since gone, and it is a very difficult thing and I want to make sure that petitioners get the best quality that they can. That's...

MS. MUNN: Which is why we've tried to, as I said earlier, give each question that has been raised the same weight, whether it really and truly deserves the same weight or not. I believe we've made every effort to do that, Brad. Don't you think we have, really?

MR. CLAWSON: Oh, I -- I do. I -- I think we have and I -- I think that also, too, we've -- I -- I think that we've made some great bounds in it. I think we've stepped backwards, too,

but I just -- you know, bottom line is is I want to make sure we get the best quality out that we can towards the claimants. And if we're going to use this data from this place or whatever, I hope that we make sure that everything we cover that we cover it the best we can so that they get the best quality they can. That's all I'm saying.

MS. MUNN: I believe every member of this workgroup has that same goal in mind --

MR. CLAWSON: And I --

MS. MUNN: -- and I certainly believe that both the agency and the contractor also have that goal.

MR. CLAWSON: So do I.

MS. MUNN: The question then becomes how long do we continue to work individual questions? We've gotten really down in the weeds here. We've gotten as far as I can imagine we can get. We have answered every question that's come before us, whether it's to the liking of each of us as a secondary question. We've certainly worked each and every question. We can continue to raise questions, or we can come to a conclusion here. I certainly would like

to see us come to a conclusion and agree that we've answered the major questions and most of the minor ones to a degree that we can feel confident we have indeed addressed the issues. If we do not feel that we've addressed the issues, tell me so and I'll go back to my original statement that I don't believe it can be done, because every person that I know at this table has worked very hard to try to identify each conceivable issue that would bear upon this site and the workers who worked there. Can we --

DR. MAURO: Could I -- yeah. As far as I concerned, we're sitting in SC&A right now having a debate about a scientific issue and we try to come to a -- and I -- and I listen to all the arguments and, as far as I'm concerned, we're a collective group of thinkers about a problem. And I like to think that what I walk away with on this one is there's one question that Bob and Arjun has raised and I feel like I'd like to get the answer to. If there was a large volume of ore sitting in that building for a long period of time, long compared to the half-life of radon, that's possible -- if

that's possible, then I would say that our simplified bounding model falls apart. If that's not the case, if there -- if the material that's entering this building is moving through the building and leaving the building, a given unit, residence time is short compared to the half-life of radon, then I would say Chick and Tom's model works as a bounding method for adjusting this problem. I don't know the answer to that question. There might have been a very lar-- there may -- there may have been a storage pile of a large inventory where that model doesn't apply. And I don't know, Jim, is that a -- I mean is that a clean --

DR. NETON: Well --

DR. MAURO: Do you see -- I mean is it possible there could have been something in the room or --

DR. NETON: Well, the -- the radium -- the radium came out with the precipitation in the sulfuric acid tank, did it not? It was filtered out as a slug -- sludge.

MS. MUNN: Yes.

DR. NETON: It'd seem to me that you couldn't

maintain much of that in the building very long. It would have to be removed, otherwise the process would stop.

MR. PHILLIPS: The process would stop.

DR. NETON: I mean because the (unintelligible) --

(Whereupon, Dr. Neton and Mr. Phillips spoke simultaneously.)

MR. PHILLIPS: -- and the gypsum back to the gypsum (unintelligible) --

DR. ANIGSTEIN: I thought it was the ore --

MR. PHILLIPS: -- so it was a continuous process.

DR. ANIGSTEIN: I thought it was the ore -- I mean the ore was generating the radium -- see, I -- I just thought more silent periods of -- it's not a question of the half-life of the radon, it's -- because it's simply the -- it's just the disintegration rate of the radium. So you know, you would -- your source term -- first of all, your source term is simply lambda times the number of atom radium you have. Whether there was radium -- it's sitting there for a very long time or whether it was moving through makes no difference because all radium

atoms are the same. And so it's the -- again, it's the residence time from the front door to the back door, if you want to look at it that way, it (unintelligible) come through, but whether -- but the half-life of radi-- of radon does not affect this because the ventilation rate exc-- it affects the --

DR. MAURO: I'm okay, I'm okay (unintelligible).

DR. ANIGSTEIN: -- but it simply -- it's being generated -- as a matter of fact, again, to use something that strikes me as more intuitive is, again, the -- the checking account model. You can make your money, but the bank -- my bank, anyway -- pays me interest on the money that sits there on -- my -- you know, my average balan-- the daily balance. So the interest rate -- the money is accumulating and there's an interest rate that I'm getting. This is exactly -- interest rate is exactly the same as the radon generation. It's proportional to the amount that sits there.

MR. PHILLIPS: But what is --

DR. ANIGSTEIN: The radon is being pumped in, so to speak, and is being then removed through

ventilation.

MS. MUNN: Gentlemen --

MR. PHILLIPS: What it's proportional to is the amount of --

MS. MUNN: Gentlemen, gentlemen --

MR. PHILLIPS: What it's proportional to is the amount --

MS. MUNN: Gentlemen, let me ask you --

DR. ROESSLER: Well, let -- let Chick -- let Chick make his --

MS. MUNN: Let's -- hold -- hold just a moment please. Hold just a moment. Robert wants to speak and he's been waiting patiently.

MR. STEPHAN: Well, I'm sor-- I'm sorry to interrupt your dialogue. My question I think is for Jim. Jim, this is the point you were going to -- do we know for sure the total amount of the ore over this time period? I mean I know we know it, for --

DR. NETON: We know --

MR. STEPHAN: -- example, a year here or there. Do we (unintelligible) --

DR. NETON: We know the production rate from the records per year. Yes, we do.

MR. STEPHAN: But do we know the -- do we know

the total? Do we -- I mean --

DR. NETON: Yes, we know the total amount of material that was processed through the building per year.

MR. STEPHAN: We do.

DR. NETON: Yes.

MR. STEPHAN: Okay, thank you.

MR. PHILLIPS: What -- what it's proportional to is the amount of radon that's being released from the ore by the process. The rate at which it's being released by the roller -- by -- by the process, not at rate it's being generated by, but the rate it's being released from the ore by the process.

CHAIR'S REQUEST

MS. MUNN: Gentlemen, I'm going to make a request. I'm going to request that we agree that we have identified the questions that need to be answered with this one -- with this one outstanding issue that several of you seem to want to -- to resolve. But those of you who have strong feelings about this and who want to pursue this need to be the people who are doing it. The rest of us really and truly don't need to hear this because, quite simply, it's too

technical and we can simplify it all we want to with -- with approximations, that's not going to change it. What we need to have, what I need to have from those of you who -- who have issues with this one question of how long is the residence time in this facility, I would like to adjourn this meeting and have those of you who feel that way sit here and resolve this issue and get back to me later tonight to tell me whether or not we can put the residence issue to bed. I'm expecting those of you who want to do this to put this to bed and get back to me and tell me that it has been put to bed. We need to get a report before the Board. We're on the agenda to get a report before the Board.

I believe I have heard from everyone here that we can agree we've addressed every issue that's been brought to us, with this single exception. Am -- am I incorrect in that?

UNIDENTIFIED: Fair enough.

MR. CLAWSON: No, that's good.

MR. GRIFFON: Let's just make sure how you're framing that 'cause I don't want to be accused later of bringing up other questions. But I

mean I'm going back to -- to Jim's presentation of the -- you know, this 1983 data versus this model, and is -- this is kind of a reality check, as I understand it, but I just want to look at the whole mod-- the residence time is one question for me, but I also have other questions on the parameter selection in this particular model. I -- I've looked at some numbers. I mean you can -- you can -- you know, I mean I wasn't in on these interviews so I don't know about the volume of the building and stuff, but I still have concerns about the --

DR. NETON: See, I -- I -- we've --

MR. GRIFFON: Anyway, I --

DR. NETON: -- we've created another issue because --

MR. GRIFFON: -- just -- just so we're looking at the -- the model as it compares to the '83 data --

DR. NETON: Right, in trying to solve -- we've created another issue --

MR. GRIFFON: I'll try to stay a little while after class, you know, but --

DR. MAURO: Lock the doors -- who's going to

stay. We'll lock the doors, we ain't leaving until we --

MR. PHILLIPS: Well, we were just trying to -- trying to answer what does the ventilation rate do to this, and of course now we're all in looking at the model. But the model is just to give us --

DR. NETON: The model was --

MR. PHILLIPS: -- an idea of what was happening, and now we're arguing about the model, but --

DR. NETON: Exactly, see --

MR. PHILLIPS: -- we can -- we can solve this.

DR. BRANCHE: But my -- but my concern is, whoever gets locked in and doesn't get any sleep tonight as you -- as you argue this through, this -- this workgroup still has to come back to -- I'm wondering if what you need still is an opportunity for this workgroup to come together and discuss whatever is the resolution of this lockup before your report on Thursday. And I don't -- it's not going to happen in a forum like this.

MS. MUNN: No.

DR. BRANCHE: So that's -- I just -- I mean I

think this is a -- I think the lockup is a good idea, frankly, but I just want to make certain that we don't have any expectations as to -- no, I'm leaving. I have another meeting. I just want to make certain that we're very clear about the fact that -- that the information stemming from this pulling-together still has to come before this workgroup.

DR. NETON: Right, I think this would be viewed as a technical interchange that we probably should have had before the meeting, but -- and then minutes could be generated of that discussion so the transparency issue is -- doesn't come into play, and that could be put together and dealt with in that manner, I guess. I don't know when the working group can get together, though. That's another --

MS. MUNN: I don't believe --

DR. BRANCHE: Not at this meeting.

DR. NETON: It wouldn't take long if we real-- if this issue were resolved.

DR. BRANCHE: Yeah, this wasn't going to take long, either, so...

MS. MUNN: It -- it won't take long if we have agreed that this outstanding issue is the one

that -- that's outstanding. But Mark is saying he has multiple issues.

MR. GRIFFON: I'm not saying I have multiple -- I'm saying the one issue --

DR. MAURO: We'll have a talk. It's time to talk.

MR. GRIFFON: -- it's -- it's the one issue of the -- the '83 versus -- this reality check on the '83 data, so whatever parameters affect that, I'm not saying -- you know, maybe it's not room size, but maybe it's just the ventilation --

DR. NETON: It's ventilation rate, in my mind.

MR. GRIFFON: -- (unintelligible) covers it all, that's all.

MS. MUNN: Let me ask this.

MR. GRIFFON: And then it's the -- you know, the '83 data, the question is, you know --

DR. NETON: How representative --

MR. GRIFFON: -- my original question is how representative is it with stuff going on there.

DR. NETON: We could talk about that. That's why --

MR. GRIFFON: And glancing through that report as we're discussing, it looks like there were

five samples for that survey --

DR. NETON: Right.

MR. GRIFFON: -- so you know.

MS. MUNN: Are the mem--

DR. ROESSLER: Christine, where --

MS. MUNN: Go ahead.

DR. ROESSLER: -- as far as the Board schedule goes, we're ahead of schedule. Is there -- because of that, is there a slot of time that could be freed up for the workgroup to meet again tomorrow maybe? They indicate this will be a -- at least part of this is a...

DR. BRANCHE: My conc-- well, here's my concern. Aside from the fact that there are two of us that have to be at all of this -- I'm point -- I'm gesturing to Ray and me. Okay? There's only two of us that have to be at everything.

DR. ROESSLER: Uh-huh.

DR. BRANCHE: We are ahead of schedule and I would -- I would suggest that if indeed the people who are going to remain behind and can discuss this can have an opportunity -- if -- if we finish up at -- you know, we have the -- the rate-limiting step is we do have a 7:30

public comment period. And if we get -- tomorrow, and we can't -- we can't move that. People are traveling based on that. We are ahead of schedule with the -- with the Board meeting, and I would imagine if we end, you know, somewhat earlier tomorrow afternoon, then I would suggest that we have an opportunity then -- 'cause Ray would have been talking anyway and I would have been here anyway. But what I don't have time for, what I don't have the -- I mean I like to -- I like to pace myself.

MS. MUNN: Understandable.

DR. BRANCHE: And what I wouldn't have time for is something that would have -- that wasn't going to be on the agenda now ends up taking three hours and I -- and Ray and I don't get a break --

MS. MUNN: No.

DR. BRANCHE: -- tomorrow afternoon. That is unacceptable. So --

MS. MUNN: This won't -- this won't work.

DR. BRANCHE: So this was supposed to be about an hour --

MS. MUNN: Yes, it was.

DR. BRANCHE: -- and we've been here --
MS. MUNN: Yes, it was.
DR. BRANCHE: -- been here for quite some time.
MS. MUNN: Yes, we have.
DR. BRANCHE: And I don't -- I'm not trying to rush it, I'm just trying to be very practical about what to expect. I couldn't be more anxious than anyone else to see this properly resolved, but I don't want speed to compete with excellence.
MS. MUNN: Nor do I. Nor do I think any of the other members of this group. If we have taken two of the items off of tomorrow's agenda, if we do not add more to it, then it is highly likely that we would be able to reach the end of the scheduled activities tomorrow by sometime at the 4:00 o'clock or so time slot. We have eliminated two half-hour --
DR. BRANCHE: We've -- we've eliminated more than that. We've eliminated --
DR. ROESSLER: We've eliminated four.
DR. BRANCHE: -- three items fr--
DR. ROESSLER: Two in the morning, two in the afternoon.
DR. BRANCHE: No, one in the morning.

DR. ROESSLER: Well, I crossed off -- oh, you're right.

DR. BRANCHE: So we've -- we've eliminated one session in the morning, and I've already talked to Dr. Ziemer about what to do there, and two of the 30-minute items in the afternoon. I suspect, however, given that we're projected for a 3-- 2:30 adjournment -- is that right, 3:30 adjournment on Fri-- on Thursday, I'll be work-- 3:00 o'clock adjournment -- I'll be working with Dr. Ziemer to move a few things from Thursday's agenda to tomorrow's agenda 'cause people tend to want to get on an airplane earlier if they can. But I can -- in fact, I'll be meeting with him in a few minutes. I will ask him if we can look to adjourn by 4:00 p.m. tomorrow to give Blockson an opportunity to reconvene.

MS. MUNN: We would certainly appreciate that, with the expectation -- am I -- am I misconstruing the expectation that we should be able to, in half an hour tomorrow --

DR. BRANCHE: I'd say an hour.

MS. MUNN: -- identify what results of tonight's activities are going to be?

DR. BRANCHE: Well, you know, I -- I will just say this. I mean -- again, I'm not -- I'm just trying to make sure that we manage our expectations. What appears to have been a very good report that Chick and Tom put together was put into the hands of -- of the Board members only today.

MS. MUNN: Correct.

DR. BRANCHE: I -- I sense that people were reading it on the fly and making an assessment on the fly, and so I don't know how much -- I mean Wanda, you've got to ask the question now how much time it's going to take for Mark, Mike and Brad to review what Chick put in their hands today.

MS. MUNN: Well, you see, this report, from my perspective, was intended only to substantiate information that's already been given --

DR. BRANCHE: Oh.

MS. MUNN: -- and to -- it was intended as a support document, not as new information. It was just a support document. So it has instead generated great grief.

MR. PHILLIPS: Wanda, I need to correct -- I need to correct one thing.

MS. MUNN: Yes.

MR. PHILLIPS: I'm responsible for the modeling. Tom and I collaborated, but I -- I'm the one responsible for the modeling, not -- not Tom, so...

DR. BRANCHE: Whatev-- I -- I would pre-- I would simply suggest, if indeed we are successful in taking advantage of the speed with which we were able to get through today's agenda and move things from tomorrow to today, and if we are able to, without any great pain, conclude the Board meeting's activities by 4:00 p.m., I am certainly willing to stay for a new meeting on Blockson. But I would simply say I'm going to ask for the gavel to be put down by 5:30 at the very latest.

MS. MUNN: I would anticipate 5:00. We all cannot handle that kind of a schedule.

DR. BRANCHE: Okay.

MS. MUNN: It's --

DR. BRANCHE: But we're not going to push tomorrow's agenda just to accommodate Blockson.

MS. MUNN: No.

DR. BRANCHE: Okay.

MS. MUNN: No, we will not.

DR. BRANCHE: We understand what the agreement is.

MS. MUNN: But I'm -- if we do not load tomorrow's agenda unduly with --

DR. BRANCHE: I -- I will confer with Dr. Ziemer this evening.

MS. MUNN: -- schedules on Thursday.

DR. BRANCHE: I'm sorry, Wanda, I was talking over you.

MS. MUNN: No, that's quite all right.

DR. BRANCHE: I'm tired.

MS. MUNN: Then we will tentatively hope for a period between approximately 4:00 and 5:00 o'clock tomorrow to wrap this up. That -- that's fine.

DR. BRANCHE: So we're officially adjourning this part --

MS. MUNN: We are officially adjourning this -- I don't know whether we should adjourn.

DR. BRANCHE: Well, the -- my question is -- I mean if Tom is going to stay on the line and participate in the lockdown --

MS. MUNN: Yes.

DR. BRANCHE: -- then we needed to leave the line open for him.

MS. MUNN: That's true. Can you do that, Tom?
MR. TOMES: I guess I can. I -- I do have one question, if I may.
MS. MUNN: Yes.
MR. TOMES: On this question of radon, our -- our task before us was to evaluate to see what kind of air changes would -- would require a certain level of change in the radon concentrations, and we were not trying to propose an accurate model number. So to argue over the accuracy of that number is really beside the point, because that was -- that was -- we -- we were not proposing an accurate mod-- mod-- number. So -- and that is the reason that we were using the 95th percentile of the surrogate data to get past that argument.
MS. MUNN: I agree. What I'm trying to do is get the people here who are disagreeing to agree also. So if you can stay on the line for a while --
MR. TOMES: Okay.
MS. MUNN: -- then we're --
DR. BRANCHE: We do have to adjourn. I mean you can't continue with Ray and I --
MS. MUNN: -- we are going to adjourn this

meeting, with the expectation that those of you who want to work this issue are going to stay here and work it until you have a solution to bring me later this evening. I will be back in a few minutes, personally, to get that. And the question that I have is do we need to continue a record of this. We're going to adjourn this meeting and what we will do, instead of having a verbatim record, is we will have brief minutes from someone -- whoever, not I -- someone is going to present me with brief -- a summary of the discussion and the solution. Correct?

UNIDENTIFIED: Yes.

MS. MUNN: All right. This meeting is officially adjourned.

DR. BRANCHE: And I'll have Zaida announce for the -- everybody about how we'll have Blockson again tomorrow.

MS. MUNN: Thank you.

DR. BRANCHE: Thank you.

(Whereupon, the meeting was adjourned at 6:15 p.m.)

JUNE 25, 2008

P R O C E E D I N G S

(4:35 p.m.)

WELCOME AND OPENING COMMENTS

DR. BRANCHE: Okay, the phone -- the line is open. I would like to start the meeting. Ray, are you ready?

Okay, could someone who's participating by phone please let me know that you can hear me?

UNIDENTIFIED: We can hear you.

DR. BRANCHE: Thank you so much.

UNIDENTIFIED: We can hear you.

DR. BRANCHE: Thank you very much. I appreciate that.

Welcome to the Blockson workgroup meeting, meeting along with the Advisory Board, part two. Will the Advisory Board members -- one second. Dr. Melius, are you perchance participating by phone?

(No response)

Okay. Will the Advisory Board members on the Blockson workgroup please state your names for the record.

DR. ROESSLER: Gen Roessler.

MR. GIBSON: Mike Gibson.

MS. MUNN: Wanda Munn. Where is Brad? He's not here.

DR. BRANCHE: Well, even with Brad, we don't have a quorum and we can continue.

Would NIOSH staff -- and I'm going to want everyone to come to the microphone --

MR. GRIFFON: I'm Mark Griffon, I'm here as well, but I wasn't a workgroup member so I just was waiting for all the other --

DR. BRANCHE: And we still don't have a quorum so we can partic-- we can continue.

Would NIOSH staff participating in the room please state your names and whether or not you have a conflict for Blockson.

DR. NETON: Jim Neton, no conflict.

MS. CHANG: Chia-Chia Chang, no conflict.

DR. BRANCHE: Would NIOSH staff participating by phone please state your names and whether or not you have a conflict for Blockson.

(No response)

No Tom Tomes today? Okay. ORAU staff by phone?

MS. KIMPAN: This is Kate Kimpan. I'm on but not participating. I mean I won't be speaking.

DR. BRANCHE: Forgive me, you'll have to say

that again. I think we caught half of every other word.

MS. KIMPAN: I'm sorry, Dr. Branche. This is Kate Kimpan. I'm on the phone, won't be speaking during it.

DR. BRANCHE: Thank you, Kay -- Kate. Thank you very much.

Yeah, Kate -- it was Kate Kimpan.

UNIDENTIFIED: I didn't get that at all.

DR. BRANCHE: SC&A staff in the room please state your names and whether or not you have a conflict.

DR. MAURO: John Mauro, SC&A, no conflict.

DR. ANIGSTEIN: Robert Anigstein, SC&A, no conflict.

DR. BRANCHE: Any SC&A staff by phone?

(No response)

John, any SC&A staff by phone?

DR. MAURO: I don't believe so, no.

DR. BRANCHE: Okay. Other federal agency staff in the room please state your names and whether or not you have a conflict with Blockson, and yes, you have to come to the microphone.

MR. BROEHM: Jason Broehm, CDC, no conflict.

MR. MCGOLERICK: Robert McGolerick, HHS, no

conflict.

MS. HOWELL: Emily Howell, HHS, no conflict.

MR. ELLIOTT: Larry Elliott, NIOSH, no conflict.

DR. BRANCHE: Thank you. Any federal agency staff by phone?

(No response)

Petitioners or their representatives please state your names and whether or not you have a conflict with -- sorry. Petitioners and their representatives please state your names.

(No response)

Workers or their representatives?

MS. PINCHETTI: Kathy Pinchetti.

DR. BRANCHE: Thank you. Members of Congress or their representatives.

(No response)

The record notes that Jeff -- Jeffrey Kotsch from DOL just entered the room.

Any others who would like to mention their names for the record?

(No response)

Thank you. I ask that all phone participants please mute your phones. If you do not have a mute button, then please use star-6. It is

critical that every phone participant mute the line.

Also if you have to leave the line please do not put this line on hold. Rather hang up and dial back in. Thank you so much.

Ms. Munn?

RESULTS FROM PREVIOUS TECHNICAL MEETING

MS. MUNN: This is the continuation of our Blockson workgroup meeting which we discontinued yesterday because of a matter of a disagreement that arose among some of our technical professionals. I would like to read this statement that resulted from their technical meeting last night into the record. You all should have a copy of it in -- before you.

(Reading) During the working Board -- Blockson workgroup meeting of June 24, 19-- 2008 there was an apparent disagreement between SC&A's technical experts over the working draft document entitled "Scoping Calculations of Radon Levels in Building 40 at Blockson Chemical." This document was prepared by SC&A and presented to the workgroup members during the above meeting.

The SC&A technical experts in the workgroup meeting included John Mauro, Chick Phillips, Robert Anigstein, Arjun Makhijani and Steve Marschke. After the formal meeting these technical experts met to resolve the concerns expressed in the workgroup meeting and agreed to the following: One, the simple model used in the working draft is appropriate for scoping the potential radon concentrations in Building 40 produced by the Blockson phosphoric acid production process. The model is based on the release of radon from the phosphate ore matrix during the continuous process phosphoric acid production.

Two, the radon concentrations in Building 40, including those measured in 1983, the bounding values from OTIB-0043 and those revised by SC&A from OTIB-0043, could be reproduced with the model, using reasonable values for input parameters such as those stated in the working draft.

Approved by John Mauro, SC&A. Jim Neton also looked at this and agreed to the wording. That issue has now been officially put to rest.

We have completed the items that were before

us. I have three questions to ask of this workgroup. I am very sorry that Brad's not here. I had hoped he would be. These questions are specifically for this workgroup because this is what I anticipate reporting tomorrow to our larger Board with respect to where we are, before we place the questions before them as well.

First, our contractor, SC&A, identified seven findings of significance in their review of this site. Following detailed technical investigation and interaction with NIOSH, they -- their report indicated that all those issues were resolved. Do you, as a workgroup, accept that report? I would like a yes or no answer from each of you.

Mike?

MR. GIBSON: Yes.

DR. ROESSLER: Yes.

MS. MUNN: Brad is not here --

DR. BRANCHE: He's right there.

MS. MUNN: Brad?

MR. CLAWSON: Yes.

DR. BRANCHE: Thank you.

MS. MUNN: Wanda, yes.

DR. BRANCHE: We have -- wait a minute, we have -- now we've got too many Board members in the room.

MR. SCHOFIELD: I'm just getting my stuff and out of here.

DR. BRANCHE: Okay.

MS. MUNN: We'll wait for just a moment.

DR. BRANCHE: While we're waiting for that moment, this is Dr. Branche. I really wasn't kidding about the phone. I think you might be surprised at how sensitive the line is and how it obscures other people's being able to hear, and it's fruitless to try to think that you are disguising yourselves by quietly participating. You really do need to mute your phone. Thank you.

MS. MUNN: We have four -- four Board members in the room at the time. We have four yes votes.

My second question: NIOSH has sought information in depth for all --

MR. GRIFFON: You have -- Wanda, you have four workgroup members mean. Right?

MS. MUNN: I have four workgroup members, yes.

MR. GRIFFON: You said Board members.

MS. MUNN: I'm sorry. Thank you for the correction.

NIOSH has sought information in depth for all activities on this site and have reported that they have adequate data to reconstruct or bound radiation doses for Blockson workers. Do you accept that report?

Mike?

MR. GIBSON: No.

DR. ROESSLER: Yes.

MS. MUNN: Brad?

MR. CLAWSON: No.

MS. MUNN: We have two yes, two no from the workgroup.

The third question: The site profile has been completely rewritten and reviewed at length. Do you accept the version of the site profile as being acceptable now?

Mike?

MR. GIBSON: No.

MS. MUNN: Gen?

DR. ROESSLER: Yes.

MR. CLAWSON: No.

MS. MUNN: Brad? We have two noes and two yeses.

That's what I will report to our Board tomorrow. I will ask the same questions of the Board at large because, as I see it, these are the three questions that we were charged with attempting to resolve in the -- in the working group. That being my intent, if anyone has any further comment, tell me now if you would like me to incorporate something else into the presentation that I will make. It will be fairly brief. It will simply say who we are, what we have met, what we have discussed, and what the results of this vote was today.

MR. GIBSON: Wanda?

MS. MUNN: Yes.

MR. GIBSON: I know we have a statement here that -- from SC&A about their agreement on the issues discussed yesterday, but we also had a lot of interest from a Board member that is not part of this workgroup and I just wonder if he might have any comment as to agreeing or disagreeing with this. I just would like his input.

MS. MUNN: Well, the reason I didn't include you, Mark -- and I didn't deliberately -- because I wanted to be able to report out for

this group --

MR. GRIFFON: Okay, that's fine.

MS. MUNN: -- the workgroup specifically, and I had assumed that any issues that you wanted to discuss further you would feel more than free to do so tomorrow --

MR. GRIFFON: Okay.

MS. MUNN: -- when it's placed before the --the group.

MR. GRIFFON: That's fine. I didn't know --

MS. MUNN: If you have something you would like me to address at the time that I make my presentation, I'll be glad to do that. Otherwise I would anticipate that if you have any problem with anything that we've said or do so far that you'd bring it to our attention.

MR. GRIFFON: All right, I can -- I'll do it tomorrow. I -- I had some detailed questions. I didn't know if you wanted to do them here or -- but I'll do them tomorrow. I mean I wasn't privy to this final -- I was in the caucus, but wasn't privy to the final statements made, but I'll save it. It's fine with me.

MS. MUNN: Very good.

MR. GRIFFON: Okay.

MS. MUNN: All right.

MS. PINCHETTI: Wanda?

MS. MUNN: Yes.

MS. PINCHETTI: This is Kathy Pinchetti, and I was in on the meeting yesterday and I was pretty amazed at the duress that the workgroup was put under to come up with a decision and put this all to rest. I think the workgroup, and maybe yourself especially, is a little tired of Blockson and just want this to go away, but there were several issues that were brought up and I don't think there was any agreement as to the answer to these questions, so I called [identifying information] today and got some information that, you know, should probably be considered.

And one of the things was the question about the ventilation, and the vents were -- they were kept closed all winter, you know, to keep the heat in. And the only change in the equipment was to change the dust out of the filters when it got clogged. The vents were open in the summer, but there were no hoods put over any of that to keep the fumes down, so I didn't know what facility you were confusing

Blockson with about the ventilation.
The guys always did double shifts. If their relief didn't show up, they had to stay because there was 24/7 production. And the only time that stopped was if there was a power failure, and there was probably a lot of those. You know, tornadoes and freezing ice and all sorts of problems. So as far as trying to decide how much exposure they were getting due to the air turnover and the amount of time they spent and the amount of time they spent in -- you know, where ore was broken up or where it was yellow-caked, it's really hard to say.
We're trying to come up with information from 1951 and 1962, so I'm wondering why we're even comparing it to Florida. I mean they may also have a phosphorus plant, but I don't think anybody moves to Joliet, Illinois to retire. I mean the climate is definitely something to be taken into consideration. And also I don't understand the reference to 1983 data. That was 20 years after the contract, so I -- I can see why there's a split decision because I think there was a lot of duress, you know, after a long day and not being allowed to leave

the room until they came up with an answer.

MS. MUNN: Well, thank you very much, Kathy. The questions that you -- the issues that you bring to us are, as you know, not new to us. We have addressed each of those in one way or another, and it is not the desire of anyone, either on this workgroup or on the larger Board nor the contractor nor the agency to attempt to rush any of this. We've made every effort to address each question that's been brought before us, and we have addressed it in varying degrees of -- of stringency, but in each case have come to either a resolution or have come to a decision with respect to how it would be reported.

We recognize all of the difficulties that you have indicated. We recognize also that what we're doing is talking about being able to bound a dose, not being able to specify doses for the individuals for whom we do not have bioassay data. But we do have bioassay data which gives us some good handle on what some of the workers could have been expected to be exposed to and were in fact known to be exposed to.

So thank you very much for your interest and for continuing to remind us what our responsibilities are. We are -- I think all of us are mindful of that on a daily basis, and we very much appreciate that you have stuck with us through what has been an arduous process for everyone involved, including you and other claimants. Thank you again for your comments and for being on the line.

Does anyone else have any comment they need to make?

(No response)

If not, I declare this meeting of the workgroup adjourned. I will make our report, according to the data that we gathered here this afternoon, tomorrow on the regular agenda. Thank you for coming.

DR. BRANCHE: Thank you.

(Whereupon, the meeting was adjourned at 4:55 p.m.)

CERTIFICATE OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the days of June 24 and 25, 2008; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 5th day of August, 2008.

_____

STEVEN RAY GREEN, CCR, CVR-CM, PNSC

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102