

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

LINDE SITE PROFILE

The verbatim transcript of the Working
Group Meeting of the Advisory Board on Radiation and
Worker Health held in Cincinnati, Ohio on
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*STEVEN RAY GREEN AND ASSOCIATES
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TRANSCRIPT LEGEND

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-- (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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OSTROW, STEVE, SC&A

P R O C E E D I N G S

(1:00 p.m.)

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2WELCOME AND OPENING COMMENTSDR. LEWIS WADE, DFO3
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DR. WADE: This is Lew Wade. I have the privilege of being a designated federal official for the Advisory Board, and this is a meeting of the work group on the Linde site profile of that Advisory Board. This work group is chaired by Gen Roessler. Josie Beach, Dr. Lockey and Mr. Gibson are members of the work group. They're all here and present in the room.

Let me start by asking if there are any other Board members who are connected to this meeting by telephone.

(no response)

DR. WADE: Are there any Board members connected by telephone?

(no response)

DR. WADE: Okay, so I judge we don't have a quorum of the Board; and therefore, we can

1 continue with our deliberations. What I'll do
2 is go through some introductions. We'll start
3 with the people around the table. Then I'll
4 ask for other members of the NIOSH/ORAU team
5 to identify themselves, other members of the
6 SC&A team to identify themselves.

7 I'll then ask for other federal
8 employees who are on the call by virtue of
9 their employment. I'll ask if there are
10 members of Congress, their staff, workers or
11 worker representatives that are on the call.
12 I'll then ask that anyone who wishes to be
13 identified, do that. And then before we begin
14 the deliberations, I'll give you a little talk
15 about phone etiquette and things we should try
16 to avoid.

17 So let's begin by going around the
18 table. I will also ask that for members of
19 the Board, SC&A, ORAU and the NIOSH people who
20 identify if they have any conflicts relative
21 to the Linde site.

22 This is Lew Wade. Again, I work for
23 NIOSH and serve the Advisory Board.

24 **DR. NETON:** This is Jim Neton. I work for
25 NIOSH, and I am not conflicted at Linde.

1 **MS. HOWELL:** Emily Howell with HHS, no
2 conflicts.

3 **DR. OSTROW:** Steve Ostrow with SC&A, no
4 conflict.

5 **DR. MAURO:** John Mauro with SC&A, no
6 conflict.

7 **DR. BEHLING:** Hans Behling, SC&A, no
8 conflict.

9 **DR. ROESSLER:** Gen Roessler, Advisory Board,
10 no conflicts.

11 **MR. GIBSON:** Mike Gibson, Advisory Board, no
12 conflicts.

13 **MS. HOFF:** Jennifer Hoff, ORAU team, no
14 conflicts.

15 **MR. CRAWFORD:** Chris Crawford with NIOSH
16 OCAS and no conflicts.

17 **MS. BEACH:** Josie Beach, member of the
18 Board, no conflicts.

19 **DR. LOCKEY:** Jim Lockey, Board member, no
20 conflicts.

21 **MR. ELLIOTT:** Larry Elliott, I work with
22 NIOSH. I have no conflicts.

23 **DR. WADE:** Now let's go out to those on the
24 telephone. We'll start with members of the
25 NIOSH/ORAU team.

1 **MS. BLOOM:** Cindy Bloom, no conflicts.

2 **DR. WADE:** Other members of the NIOSH/ORAU
3 team?

4 (no response)

5 **DR. WADE:** Members of the SC&A team?

6 **MR. CHAN:** Desmond Chan, no conflict.

7 **DR. MAKHIJANI (by Telephone):** Arjun
8 Makhijani, no conflicts.

9 **DR. WADE:** Hello, Arjun.

10 Other members of the SC&A team?

11 (no response)

12 **DR. WADE:** Other federal employees who are
13 on the call by virtue of their employment?

14 **MR. KOTSCH (by Telephone):** This is Jeff
15 Kotsch, Department of Labor.

16 **DR. WADE:** Hi, Jeff, as always welcome.

17 I'm asking for members of federal
18 employees who are on the call by virtue of
19 their employment.

20 **MS. CHANG (by Telephone):** Chia-Chia Chang
21 with NIOSH.

22 **DR. WADE:** Hi, Chia-Chia.

23 Any other?

24 (no response)

25 **DR. WADE:** I've also already asked for

1 NIOSH/ORAU team and SC&A team. I'm going to
2 move now to members of Congress, their staff,
3 workers or worker representatives.

4 (no response)

5 **DR. WADE:** Anybody on the call who wishes to
6 be identified that hasn't already identified?

7 (no response)

8 **DR. WADE:** Okay, before we begin I'd ask you
9 to use common sense in terms of your
10 connection by telephone. If you're not
11 speaking, then mute your phone. If you are
12 speaking, speak into a handset as opposed to
13 using a conference call. There's all kinds of
14 background. Be mindful of background noises.
15 Again, we want to use conference calls. It
16 facilitates the Board's work, but if there are
17 poor etiquette practiced, it can be difficult
18 for us to do this. So think about background
19 noises. Think about what you're doing, and
20 we'll begin.

21 Gen?

22 **INTRODUCTION BY CHAIR**

23 **DR. ROESSLER:** So we're meeting to go
24 through the issue resolution matrix for the
25 Linde findings. The first thing I'd mention

1 is that we did get this, the SC&A findings,
2 the NIOSH response. We received a copy from
3 Chris which was a little difficult to read for
4 those of us who have reading glasses. The
5 font was kind of small.

6 Steve actually took that and put it in
7 a bigger font. I hadn't asked him to do it,
8 but I appreciate it. And it's in a landscape
9 form so if anybody needs this extra little
10 help in looking at it, I did make another
11 copy. I've got just one. I wonder if there's
12 another copy for Mike to look at.

13 So on the SC&A team we have Steve
14 Ostrow who's working with us, and the NIOSH
15 person is Chris Crawford. Typically, in these
16 work group meetings we go through the matrix
17 step-by-step. I would like to propose doing
18 this a little differently. I'm not feeling
19 real strongly about it, but Steve had sent to
20 me a list -- I had asked him for the most
21 significant issues that SC&A found. And he
22 sent me a copy of that, and I sent them to the
23 work group. I'm not sure if Mike got his.

24 And I was wondering if it would be
25 more efficient to go through it from that

1 point of view, not actually step-by-step
2 through the matrix but deal with the
3 significant issues. And I can call those out
4 as we go. Those significant issues I think
5 are also in your review of the site profile,
6 aren't they?

7 **DR. OSTROW:** Maybe not. Gen, I'd like to
8 change it a little bit here. We had sent you
9 the significant issues I think like last
10 Tuesday before we had the NIOSH response,
11 which means there is a difference. And after
12 spending the weekend looking at the two of
13 them, some of the significant issues we sent
14 you, I don't think are that significant any
15 more.

16 **DR. ROESSLER:** Well, that's good.

17 **DR. OSTROW:** I think we'd like to do a
18 little bit of what you propose, and we have a
19 few significant issues that we'd like to
20 discuss first, and maybe then go through the
21 22 comments we have. Some of them are not too
22 important after reviewing things. Just a few
23 of them have actually some importance, and a
24 number of them are quite redundant. So I
25 think we'd like to proceed in a little bit

1 different order than what we had sent you.

2 **DR. ROESSLER:** So what you're suggesting is
3 out of the list of significant issues you sent
4 around to the work group that you now have a
5 different list, a shorter list, of significant
6 issues. So perhaps the approach, if this is
7 okay with Chris and the rest of the work
8 group, would be to for you to say here's the
9 issue we want to discuss first.

10 **DR. OSTROW:** Yeah, I think so. I'd like to
11 give a little introduction which will be very
12 brief, what we see as some significant things.
13 Then I think we could go through the
14 individual issues fairly quickly. Most of
15 them are sort of either short discussion or no
16 never mind and just concentrate on the couple
17 that are of more significance.

18 **DR. ROESSLER:** So to do this you would take
19 the matrix then, point out the issue so we
20 could all look at it and follow through on
21 that.

22 Now how do you feel about this, Chris
23 and Jim? Would this be an appropriate --

24 **DR. OSTROW:** We'll cover everything in the
25 matrix but --

1 **DR. WADE:** If I can ask you just to speak up
2 a little bit if you could.

3 **DR. ROESSLER:** Okay, so --

4 **DR. MAKHIJANI (by Telephone):** This is
5 Arjun. This is Arjun. Steve, did you get my
6 e-mail on the weekend?

7 **DR. OSTROW:** Yeah, I got it with my, I
8 looked at it just before I went to bed
9 actually. Yeah.

10 **DR. MAKHIJANI (by Telephone):** Okay, so I
11 guess you'll factor that list in as you feel
12 appropriate?

13 **DR. OSTROW:** I will. If I miss anything,
14 please jump in.

15 **DR. MAKHIJANI (by Telephone):** Okay, great.
16 Thanks.

17 **DR. ROESSLER:** Okay, so go ahead and take
18 the (unintelligible).

19 **INTRODUCTION BY DR. OSTROW**

20 **DR. OSTROW:** I just want to say that I was
21 the lead reviewer on the Linde profile for
22 SC&A. And the other person who did a lot of
23 the work, Desmond Chan, is on the telephone
24 line also and Desmond should jump in also if
25 necessary.

1 Operations office, 1949 report. And this is
2 the basis for the data which we have a copy of
3 if you have to refer to it.

4 That's "Health Hazards in NYOO
5 Facilities Producing and Processing Uranium
6 Status Report", April 1st, 1949, in which the -
7 - I guess it was the AEC New York Operations
8 Office looked at various uranium processing
9 plants in New York state and looked at the
10 Health Physics. I think there were seven
11 plants and Linde was one of them.

12 This formed the basis of the internal
13 dose based on measurements that were taken at
14 Linde. The maximum value for airborne
15 concentration was 33 MAC which is found for
16 Linde. I was looking at some data and that
17 air concentration data was then used for
18 internal dose in the ORAU calculations. And
19 the internal dose consisted of two parts,
20 inhalation and ingestion. So it was used for
21 an inhalation and ingestion.

22 Now some of the questions we've had,
23 first of all we looked at, since everything is
24 based, or a lot of it's based on this 33 MAC
25 assumption, is that a good assumption to start

1 with? Is 33 MAC really a limiting value of
2 the site?

3 **MS. BLOOM (by Telephone):** John, this is
4 Cindy Bloom, and since this first came out
5 which we were on a tight schedule, we've
6 assembled the internal dosimetry data that
7 would better relate to the issue. And I guess
8 from where I sit, I would propose we go back
9 and analyze that data. We have a little over
10 700 uranium bioassay results, urinalysis
11 results that we can use to develop the
12 internal intakes a little bit better I think.

13 **DR. OSTROW:** Okay, so you're saying that
14 you're going to be re-looking at the internal
15 dose using this bioassay data that you have
16 now?

17 **MS. BLOOM (by Telephone):** Correct, with
18 NIOSH's permission and approval.

19 **DR. MAKHIJANI (by Telephone):** Cindy, this
20 is Arjun. Does the bioassay data span the
21 different production periods, you know, the
22 African ores, the U.S. ores, and just
23 concentrates, so on?

24 **MS. BLOOM (by Telephone):** Arjun, there is
25 an SEC that goes through October 31st, 1946 --

1 **DR. OSTROW:** 'Forty-seven, 'forty-seven.

2 **MS. BLOOM (by Telephone):** --and there was
3 no African ore production during the
4 production periods after that time. They
5 started with U-02 concentrates.

6 **DR. MAKHIJANI (by Telephone):** Oh, okay,
7 thank you, thank you. Yeah, I'd forgotten
8 that.

9 **MS. BLOOM (by Telephone):** So the bioassay
10 actually that we have right now is from the
11 end of 1947 through the very beginning of
12 1950.

13 **DR. MAKHIJANI (by Telephone):** Thank you,
14 thank you for clarifying that. I had
15 forgotten that.

16 **MS. BLOOM (by Telephone):** You're welcome.

17 **DR. ROESSLER:** Steve, are you giving us
18 background now? Are you dealing with a
19 particular issue --

20 **DR. OSTROW:** I'm just giving you two more
21 minutes of background so you can see where
22 we're coming from, then we can talk about
23 issues.

24 **DR. ROESSLER:** Okay.

25 **DR. OSTROW:** So anyway, so some questions,

1 first, as I said is the 33 MAC a good number?
2 Is it really, because if it really is a
3 limiting value, some of our comments go away.

4 Two, can you legitimately estimate
5 airborne concentrations, are the inhalation
6 doses from the air concentration data in the
7 uranium facility? We have some questions
8 about that. How widely you can relate the
9 two.

10 And three --

11 **MS. BLOOM (by Telephone):** I'm sorry. I
12 didn't hear two. There's a cell phone it
13 sounds like on this line.

14 **DR. OSTROW:** I think two was can you
15 reliably estimate inhalation doses from
16 airborne concentrations in a uranium facility?

17 And three is the ingestion thing. It
18 was assumed that the ingestion is 0.2, 20
19 percent of the inhalation. Is that a good,
20 valid procedure to take also?

21 So this is all like a sequence of
22 things to look at for the internal dose.
23 That's basically where we're coming from. So
24 I think I would go through our specific
25 comments. A number of them are redundant, and

1 a number of them deal with these issues.

2 And a number of them we looked at over
3 the weekend and decided aren't too important.
4 So I think we can start like at issue number
5 one, just run through, and the ones that
6 aren't important we can get rid of quickly.

7 Sound okay with everyone?

8 **DR. ROESSLER:** Sound okay, Chris?

9 **MR. CRAWFORD:** Yes.

10 **ISSUE ONE**

11 **DR. OSTROW:** Number one, this is where I,
12 one of the things I apologize for. I
13 criticized too much maybe the way it was done.
14 And NIOSH said my comment's too general and
15 all that and so forth. This is what we
16 criticized basically that there were
17 unsupported assumptions and significant
18 uncertainties in the information used.

19 Well, maybe that's overstating it. We
20 do have some comments though on some specific
21 issues. For example, whether -- this is sort
22 of general. Were all the contaminated areas
23 taken care of. For example, when we did
24 interviews with the workers up in the Buffalo
25 area after we started doing our review, the

1 workers seemed to think there were more
2 contaminated buildings and areas than were
3 identified in the site profile. Whether these
4 were important or not, the workers seemed to
5 think there were more areas than that.

6 There was also the issue, which I
7 don't know if it was mentioned in the site
8 profile. I didn't find it. But if tunnels,
9 apparently, there are all sorts of utility
10 tunnels that ran under the buildings, and the
11 workers have been giving stories about how,
12 especially when it rained and this that and
13 the other thing, the water would be dripping
14 down. And if the buildings were contaminated,
15 then the water in the tunnels would be
16 contaminated. And I don't know if this was
17 looked at or not or if this really happened or
18 not. These are recollections and 50 years
19 ago.

20 The workers mentioned various piles of
21 radioactive stuff, water and other things
22 outdoors. I know the report mentioned a few
23 places that you had looked at piles of
24 radioactive stuff outdoors. But this is just
25 a question of whether, you know, how deeply

1 you looked. Did you include everything that
2 you could find in that? Are there other
3 things?

4 And one of the issues that came up a
5 little bit later that we actually pulled out
6 separately, the burlap bag business, which you
7 did mention in your report, but apparently
8 there were tens of thousands of burlap bags.
9 These are the ones that were used to hold
10 uranium, uranium rods and ore, arrived in rail
11 cars and workers pulled the stuff off in 50
12 pound burlap bags.

13 When the bags were empty, they stacked
14 the bags up in piles, and the workers
15 recollect sitting and eating lunch on them
16 because they were nice and comfortable
17 outdoors. And I know the bags were supposedly
18 empty, but since it's burlap, and they've got
19 a lot of uranium dust, they probably had some
20 activity which may be small for one bag, but
21 if you've got lots of bags and your sitting on
22 it, maybe that's an important contributor,
23 maybe yes, maybe no. That's something to look
24 at.

25 So that's issue one. There's nothing

1 to resolve, really, in issue one. It's just a
2 question of taking a look at some more things.
3 Oh, and one other thing that Arjun had brought
4 up in his e-mail that he sent last night, the
5 burlap bags were eventually burned, I think,
6 or incinerated.

7 Now I didn't see any mention in the
8 TBD of an incinerator and which either means
9 that there was one, maybe there wasn't one
10 onsite. But somewhere they incinerated all
11 these bags, and I'm not sure where they
12 incinerated them.

13 **MS. BLOOM (by Telephone):** There were two
14 different periods of time, John. There was
15 burning of the bags. There was an
16 incinerator. I found a reference that
17 mentioned it in 19, the earlier 1940s. Also,
18 those were the ore bags that were referred to.
19 And remember again that there's an SEC based
20 on the internal exposures during the earlier
21 years. And so we're looking at November 1947
22 forward for internal exposure from whatever
23 might have been on site at that point.

24 **MR. CHAN: (by Telephone):** Cindy, this is
25 Desmond Chan. When we talked to the workers,

1 they actually were talking about there's
2 thousands of bags after the '50s. They're
3 still sitting behind building 30s in the bay
4 area when they have other trucks coming in and
5 out. And they're piling up there. They
6 probably are just sitting there for like a few
7 years before they are moved away or
8 incinerated or burned. So I think that is
9 what we are so concerned about.

10 **MS. BLOOM (by Telephone):** I think we
11 probably all need to go back and look at the
12 references and see what's there because I do,
13 I have seen references to piles of bags
14 sitting onsite. I do see information that
15 indicates that procedures changed over time.
16 But at this point I'm not willing to --

17 **MR. CHAN (by Telephone):** I understand,
18 yeah, we'll just point out that there's some
19 concern there.

20 **MS. BLOOM (by Telephone):** Right.

21 **DR. MAURO:** This is John Mauro. I'd like to
22 also add maybe it's more about a policy
23 question. I understand there is a break point
24 between the SEC period and a non-SEC period.
25 But nevertheless, the matrix for doing dose

1 reconstruction there are the non-presumptive
2 cancers that still need to be dealt with. And
3 so I would imagine that the technical issues
4 that we may have that may apply or be of
5 concern during the, I guess, what's it? Pre-
6 1947 or (phone interference) time period. The
7 SEC (phone interference). We're still
8 interested in that, and I believe it's valid
9 to address issues, even though they aren't in
10 the SEC period.

11 **DR. NETON:** We have to look at the
12 definition that the SEC has and what reasons
13 the SEC was granted, for example, that says we
14 just have no knowledge of reconstructing four
15 doses because there's no data, then when it
16 comes to reconstructing non-presumptives we
17 would say can't do it.

18 **DR. WADE:** But you should raise your
19 technical issues. They need to be looked at
20 in light of the SEC definition to see if we
21 really need to dismiss the issue because the
22 SEC definition says we can't, we haven't
23 learned anything about that. Or if it
24 doesn't, then it might relate to the non-
25 presumptive cancer. So you should raise your

1 issues.

2 **DR. NETON:** In fact, the only revision to,
3 that I see in this TIB or this site profile
4 was PC-1, which was issued to incorporate.
5 We've gone through the site profile and
6 modified it to deal with non-presumptive
7 cancers. Or modified to incorporate the
8 comments that were raised in the SEC that kind
9 of said what we can and cannot do in this
10 document. Good point.

11 **DR. ROESSLER:** So then going back to Steven
12 mentioning the burlap bags. Should that be
13 dealt with here or that's issue number 17?
14 Did you want to pursue it --

15 **DR. OSTROW:** I think we did deal. I think
16 that's it for the burlap bags. I think it's
17 basically that they may have been an issue
18 from the early days on through the 1950s. And
19 basically we have to check and see how they
20 were handled, you know, whether they were
21 significant or not significant.

22 **DR. ROESSLER:** So are we actually discussing
23 issue 17 now is my question.

24 **DR. OSTROW:** Yeah, I think so.

25 **DR. ROESSLER:** I think we kind of jumped --

1 **DR. OSTROW:** Bounced around, didn't we?

2 **DR. ROESSLER:** Yeah.

3 **DR. OSTROW:** Good, we finished 17. That's
4 enough.

5 **DR. ROESSLER:** I just want to make sure. I
6 don't have anything to write here. What did
7 we say about 17? What's the conclusion on it
8 and what, is there an action item for NIOSH on
9 it?

10 **DR. OSTROW:** Yeah, I think 17's done. And I
11 think the action item, well, it's two action
12 items. One's for NIOSH to research the burlap
13 bag issue, take a look at their documentation
14 --

15 **MS. BLOOM (by Telephone):** Excuse me. Item,
16 issue 17 is related to external exposure.
17 It's not related to internal exposure.

18 **DR. OSTROW:** Yeah, yeah, 17's external.

19 **MS. BLOOM (by Telephone):** I think then your
20 idea of picking an approach and sticking with
21 it is probably a good one until we capture the
22 issues that are important and don't bounce all
23 over the place.

24 **DR. OSTROW:** Okay, I'll try not to bounce
25 too much.

1 **MS. BEACH:** Well, and I have an issue with
2 it being just external because if you're
3 sitting on thousands of bags during lunch and
4 break and someone flops down next to me, can I
5 be contaminated by that? Or can I get some
6 internal? So I think that needs to be
7 explored to what, it says lightly
8 contaminated, but what does that mean? And it
9 says for years so --

10 **MS. BLOOM (by Telephone):** There are two
11 different issues. There are the ore bags that
12 came in prior to 1947 when the SEC was
13 established, is now established. So those are
14 in the SEC periods, and we've said we cannot
15 reconstruct that dose. Now there's an
16 allegation that burlap bags were still sitting
17 around during that later period.

18 And the answer to that is we need to
19 look into that further. We haven't seen
20 evidence of that in the documentation that
21 we've looked at. They were handling waste a
22 little bit more efficiently it looked like to
23 us when we reviewed the records. But we need
24 to look into that for the internal issue after
25 1947.

1 **DR. ROESSLER:** So is that both an internal
2 and an external?

3 **MS. BLOOM (by Telephone):** Right, but issue
4 17 in the matrix is only external.

5 **DR. OSTROW:** That's true.

6 **MS. BLOOM (by Telephone):** There's another
7 issue somewhere before that on internal from
8 the bags.

9 **DR. OSTROW:** Okay.

10 **DR. ROESSLER:** Can you print that out so we
11 know where we're --

12 **DR. OSTROW:** What issue is this?

13 **DR. ROESSLER:** So we can sort of follow
14 through on these and make sure we don't lose
15 something.

16 **MS. BLOOM (by Telephone):** Or just in
17 general on the internal ones. So I guess in
18 general I would go back and say that this has
19 to do with going back and looking. We now
20 have bioassay data to go back and use. So we
21 would capture it that way.

22 **DR. LOCKEY:** You're talking about issue 17?
23 This is Jim Lockey.

24 **MS. BLOOM (by Telephone):** Issue 17 when I
25 read the NIOSH report appeared to be looking

1 primarily at external dose issues. On the
2 internal dose issue we would look at that, and
3 that's really summarized sort of by issue two,
4 I guess, the use of air concentration data.
5 We would go back and look at the bioassay data
6 which would include consideration of the
7 internal dose from the burlap bags, the folks
8 who had bioassay.

9 **DR. ROESSLER:** So it appears we're now
10 talking about issue two and issue three
11 because Cindy's bringing up the urinalysis
12 data that would be used apparently in lieu of
13 doing the air concentration. Is that where
14 we're at?

15 **MS. BLOOM (by Telephone):** We would look at
16 both sets of data, Gen, but probably the
17 urinalysis data would win out as you point
18 out.

19 **DR. ROESSLER:** It seems like that may be the
20 most important issue on the table right now is
21 to evaluate that. Would that be what you
22 think, Steve?

23 **DR. OSTROW:** Yes, it comes with both
24 internal and external of the burlap bags and
25 what you would affect the air concentration

1 data if you sit on the bags and would have to
2 get dust in the air and breathe it in and
3 ingest it if you're eating lunch.

4 **MR. CRAWFORD:** Is that likely to exceed the
5 33 MAC?

6 **DR. MAURO:** I think that --

7 **DR. OSTROW:** Probably not, maybe not but --

8 **DR. MAURO:** Let's work our way down and as
9 the original plan. Work our way through and
10 the ones that we can do quickly, we do
11 quickly. And the ones we have to stay on, we
12 stay on. Otherwise, we're going to lose
13 control.

14 **ISSUE TWO**

15 **DR. OSTROW:** Okay, issue two. This is the
16 issue of air concentration data. As I
17 mentioned before, how valid is it to use the
18 air concentration data as the estimate for
19 internal dose estimation, as the basis for
20 internal dose estimation?

21 John, I think you had something to say
22 about that? Do you want to report on this?

23 **DR. MAURO:** Well, it turns out I've been
24 looking at a lot of the air data for all the
25 AWE facilities on Chapman Valve, and Dow and

1 across the board. And the data -- now, as I
2 understand it, the 33 MAC, I guess the bottom
3 line is that we have some criticism of 33 MAC
4 that to a certain extent I want to buffer down
5 a bit.

6 As I understand it, the work done by
7 the New York Operations Office in 1949, they
8 took a number of measurements, a large number
9 of measurements, for Linde. And they did come
10 up with it looked like time-weighted averages
11 for different operations. And the highest
12 daily time-weighted average amongst the whole
13 bunch that they saw was 33 MAC.

14 Now I walk away from that saying
15 that's pretty good. One of my concerns has
16 always been if I have a number of air
17 measurements, each one's a time-weighted
18 average representing a different type
19 operation, and I have a bunch of workers, I'm
20 not quite sure where they worked, but they
21 did, in my opinion, you pick the highest time-
22 weighted average because that's your, would be
23 a plausible upper bound. So I walk away
24 saying that's a pretty good number.

25 And we have some criticisms here that

1 there should be some uncertainty. I think in
2 re-thinking this, you know, if you pick 33 MAC
3 as a plausible upper bound, you don't really
4 have to assign uncertainty because you've
5 picked an upper bound, but it's a plausible
6 upper bound. So I'm not saying it's off the
7 charts, but it's up there.

8 The only thing that I walked away with
9 that said I still have some concern is that
10 it's not apparent when I read the NYOO report
11 that the 33 MAC was obtained from breathing
12 zone samples or from general air samples. My
13 experience is that the relationship between
14 intake and general air samples is pretty poor.
15 There's lots of literature on that. But the
16 relationship between breathing zone samples
17 and intake is a lot better.

18 So my question to you -- I guess it's
19 a layered question. One is if you were, in
20 fact, going to base your model, your exposure
21 matrix, on 33 MAC for inhalation of uranium --
22 we haven't even talked about the other
23 radionuclides -- on first blush I would say
24 it's a good number, but I would like to hear a
25 little bit more about the degree to which that

1 33 MAC was obtained from general air samples
2 or from breathing zone samples.

3 And I guess that's my question. You
4 may have an answer to that, but on top of that
5 it sounds like you did one better. It sounds
6 like you've got a lot of bioassay data. Now
7 if you've got 700 bioassay data samples that
8 go back to the full time periods of concern,
9 well now you've struck gold. And you can say
10 a lot about what the intakes were.

11 You're in a position to validate the
12 33 MAC so it becomes a very important data
13 source to support. It sounds like it's being
14 done because of the SEC, but that's extremely
15 valuable. But item number two simply boils
16 down to I'd like to hear a little bit more
17 about the 33 MAC and whether or not you think
18 that represents the breathing zone sample or
19 is that something that comes from general air
20 samples.

21 **DR. BEHLING:** So can I ask a couple
22 questions about the particular measurement?
23 This was a time-weighted average for, I
24 assume, an entire shift for all the different
25 workers. And was this part of an audit that

1 was announced? And sometimes that's a very
2 critical thing if this was like an audit by
3 NYOO, people tend to clean up their act for
4 the duration of the audit. All of a sudden
5 people wear respirators. They are mindful of
6 certain things. They're being watched, and
7 the question is if that particular measurement
8 --

9 And I'm not questioning the validity
10 of that time-weighted value, but if this was
11 done as part of a scheduled and known audit by
12 the NYOO. One also has to look at it in the
13 context with everyday, normal operation that
14 may have been (inaudible). The conduct of
15 workers is somewhat different.

16 **MR. CRAWFORD:** I think the respirator issue,
17 while probably true, people would tend to wear
18 them while inspectors were present, probably
19 isn't relevant for the measurement, however,
20 of the air concentrations.

21 **DR. BEHLING:** Well, yes and no. For
22 instance, I'm looking at some key things that
23 maybe I missed here in discussing, but I'm
24 looking at some documents involving Fernald.
25 And there's a right way to do something, and

1 there's a wrong way.

2 And one of the funny things was people
3 were asked to transfer certain amounts of
4 material including uranium from one location
5 to another. And the operator was identified
6 as saying if I do it very carefully, this is
7 what general air sample data concentration
8 would yield, and again, it's an empirical
9 measurement.

10 And if I do it modestly carefully,
11 this is what it'll do. And if I'm in a very
12 hurry because of production quotas that are
13 pushing at my back, I'm going to do it very
14 recklessly. So yes and no. It's air
15 sampling, but air sampling done under
16 different conditions of motivation by the
17 worker.

18 **MS. BLOOM (by Telephone):** Just to, in
19 general at this period in time, the AEC was
20 coming in to see what was going on. It wasn't
21 really considered an audit in terms of we're
22 going to beat you up if you're not doing well
23 enough or if you're not following the rules.
24 We want to collect information.

25 In general, they would collect

1 breathing zone samples, general area samples
2 and sometimes process samples which tend to be
3 even higher than the breathing zone samples.
4 I think that we've stated that we're going to
5 go back and look at the bioassay samples so I
6 think a lot of this is moot.

7 But I also think that you mentioned
8 use of respirators. And I think you need to
9 remember that this was a chemical operation
10 involving hydrochloric acid. Hence, that
11 should maybe color how much you think people
12 were wearing respirators or not. I do think
13 they were a little bit more likely in this
14 kind of operation to be wearing their
15 respirators. Certainly, the people who were
16 the chemical operators --

17 **DR. ROESSLER:** Cindy, are you saying that
18 you have bioassay samples during the period of
19 time under discussion so you could validate
20 that 33?

21 **MS. BLOOM (by Telephone):** Right, we're
22 going to go back and look at a coworker study.
23 We're not intending to either validate or
24 reject the 33 MAC. That was our first
25 approach at trying to come up with a way to

1 speed along the dose reconstructions. But
2 we've now got this other data that we feel is
3 more representative of what workers were
4 actually exposed to.

5 So we're going to look at that and
6 assuming that it is a valid set of data that
7 covers a great enough period of time, we're
8 going to substitute that, which doesn't mean
9 we're going to lose that air sample data
10 because that's good to know as well, but the
11 reliance is going to be on the bioassay data
12 as it has been for most every site profile
13 where we can find bioassay data that's
14 applicable.

15 Does that make sense?

16 **DR. BEHLING:** Does the bioassay data include
17 isotopic evaluation or is it basically
18 photofluorometric that just gives you units of
19 uranium per liter? Based on the fact that
20 we're also dealing with Belgian Congo pitch
21 blend, what kind of bioassay data do we have?

22 **MS. BLOOM (by Telephone):** Once again I need
23 to say that they were not processing ore as of
24 1947, November, 1947. They were starting with
25 U-02. This is uranium urinalysis data. We do

1 have some radon breath analysis from 1944 and
2 1945 that could be used to estimate an upper
3 bound on radium intakes, but I don't think
4 that's an important point because we're moving
5 forward from 1947.

6 Now I think as we move down the matrix
7 when we talk about other radionuclides there
8 may be an issue there. But I think we should
9 hold off until we get to that place. Right
10 now I'm just talking about uranium intakes.

11 **DR. MAURO:** This is John Mauro again. Just
12 to help everyone around the table, this
13 special study that was done by the New York
14 Operational Office, they actually, it was only
15 performed over a one-week period according to
16 the data, to Linde. And they broke up the
17 different types of operations into 21 separate
18 different operations. And the one that by far
19 had the highest time-weighted average was one
20 particular called Group B and C operations
21 which had the 33 MAC.

22 So my first reaction to that was,
23 well, of all the different types of
24 activities, certainly, all the workers weren't
25 involved. To assume every worker that was

1 there experienced a 33 MAC seems to be a
2 reasonable, plausible bounding assumption.
3 And now this dataset by the way not only for
4 Linde but the other seven facilities, which
5 include Harshaw and several others, they
6 become a very important rock that all of the
7 AWE work is standing on. And the fact that
8 you now have bioassay data that goes along
9 with this, you've found a holy grail.

10 In other words in my opinion a
11 comprehensive evaluation of the validity of
12 using time average, whether these are
13 breathing zone or not I'm not sure, but let's
14 assume they were, data as the rock you're
15 standing on because by the way that's where
16 OTIB-4 comes in. It's an extremely important
17 document. This particular dataset now is
18 going to validate the use of these air
19 sampling data as a plausible upper bound. So
20 I'm very happy to hear this, and I think it
21 looks like, Jim, you're excited about doing
22 this.

23 **DR. NETON:** Yeah, yeah.

24 **DR. LOCKEY:** John, how many samples were
25 there in that database?

1 **DR. MAURO:** I'm looking at the columns and
2 out of those 21 the highest one that looks
3 like there was 15 samples. The second highest
4 there were three. The third -- so we're
5 talking a total of, I would just guesstimate
6 from eyeballing this table it looks like over
7 100.

8 **DR. LOCKEY:** A hundred samples.

9 **DR. MAURO:** Over 100 air samples.

10 **DR. LOCKEY:** And most of them are clustered
11 around what? What was the results?

12 **DR. MAURO:** They range from a MAC of less
13 than one.

14 **DR. OSTROW:** Most of them are less than one.

15 **DR. MAURO:** In fact most of, it turns out
16 interestingly there was that preferred level,
17 the 70 MAC.

18 **DR. NETON:** Seventy DPM.

19 **DR. MAURO:** Seventy DPM, right, right. So
20 one MAC it looks like most of them, the vast
21 majority of them were below one MAC, the
22 preferred level. But there were a total of 18
23 out of the 100 or so that were above one MAC.
24 And the worst one was, the worst cluster of
25 15, was one particular operation, the Group B

1 and C Operations it's called, that was the
2 highest one amongst, that was 33 MAC.

3 And so someone to say in Linde
4 operations if you happen to be working in
5 Group B and C, your reasonable estimate for
6 you would probably be on the order of 32 MAC.
7 That appears to be the worst case, with the
8 proviso that this was breathing zone. If it
9 wasn't breathing zone but included a lot of
10 general air samples, then you could question
11 it.

12 **DR. NETON:** Well, we've been through this
13 method before at Bethlehem Steel, and it's
14 really, like Cindy said, a combination of
15 breathing zone when the workers were actually
16 doing a process. But when they take a break,
17 and they go into a locker room, for example,
18 they'll use a general area sample which I
19 think is fairly representative of the area.
20 It's not subject to the drop off in
21 concentration as you move away from the exact
22 source because you're fairly far, the general
23 area samples were fairly far removed from the
24 source of the generators.

25 **DR. MAURO:** So by definition when I hear

1 there is a time-weighted average, because
2 that's how they represented here, you could
3 safely presume that means a combination --

4 **DR. NETON:** And that methodology has been,
5 we provided that before to you guys.

6 **DR. ROESSLER:** So does that mean that this
7 new dataset and the new evaluation that
8 they're going to do that we have taken care of
9 a number of issues? I'm interested in getting
10 through the numbers here.

11 **DR. LOCKEY:** It's a very valuable dataset if
12 you can correlate it with the internal dose
13 issue, and you're dealing, most of yours are
14 under one MAC, but you've got some extremes
15 there, and you should be able to correlate
16 that with your internal dose.

17 **DR. MAURO:** To answer your question, Gen, it
18 deals with the uranium side of the house, not
19 the thorium, raffinates, those are going to be
20 tough nuts to crack, and we'll get to those.

21 **DR. ROESSLER:** So looking at the matrix
22 then, how far down have we moved? Have we
23 actually gone through issue six? Certainly,
24 we've been concentrating on two and three. It
25 appears that we've talked about the time-

1 weighted averages in issue four. We talked
2 about breathing rate, which you said, and the
3 ingestion rate. It seems to me we've covered
4 through six.

5 **DR. MAURO:** I think, you know, six.

6 Jim, correct me if I'm wrong. The
7 method used in issue number six, the dealing
8 with ingestion?

9 **DR. NETON:** Right.

10 **DR. MAURO:** That was the old .2 rule of
11 thumb.

12 **DR. NETON:** OTIB-9.

13 **DR. MAURO:** And now from reading recently I
14 read the updated Bethlehem Steel site profile.
15 It looks like you've come up with a
16 correlation between activity --

17 **DR. NETON:** We did that for Bethlehem Steel
18 because we had some of the Simond's Saw and
19 Steel information, but we still are committed
20 to revisiting that model and coming up with at
21 least validating the .2 or coming up with a
22 different approach. I think if we use
23 urinalysis data, the ingestion goes away
24 because then you can either assume it was all
25 ingestion or all inhalation and --

1 **MR. ELLIOTT:** That model being TIB-9 or the
2 Bethlehem Steel exposure model? I'm sorry,
3 you said that model, lost me.

4 **DR. NETON:** TIB-9. Bethlehem Steel was a
5 unique situation where we found, we used
6 Simond's Saw and Steel data to sort of, and
7 surface contamination data, remember we had
8 that whole discussion. And we included that
9 in the Bethlehem Steel site profile. And
10 SC&A's position at that time was, well, this
11 sounds really good in principle, and you have
12 some data you could use there. But you
13 weren't convinced that it was generally
14 applicable complex wide. So we still owe that
15 piece which is a TIB-9 re-evaluation. But
16 again, if we go to urinalysis data then the
17 ingestion rate goes away because we're not
18 inferring any ingestion rate any more. We're
19 using what's coming out in the urine to
20 determine --

21 **MS. BEACH:** And that would take care of
22 number five, the breathing rate that was in
23 question --

24 **DR. NETON:** Yes, all those issues go away if
25 we have a valid coworker model.

1 **DR. ROESSLER:** So basically we have looked
2 at internal uranium, we promised to look at
3 the bioassay data and come back and revisit
4 all of these issues brought up in one through
5 six, one being a rather general one. So is
6 that a consensus that we have, on those
7 issues?

8 **DR. MAURO:** Yes, one through six covered.

9 **DR. ROESSLER:** Then what is your, Steve,
10 would you want to just continue on and go --

11 **DR. OSTROW:** Yeah, let's just keep going.
12 Some of the other issues that are redundant we
13 can just pull out anyway because they're
14 already covered.

15 **ISSUE SEVEN**

16 **DR. ROESSLER:** Do you want to go through
17 sequentially and get into the radon exposure
18 then?

19 **DR. OSTROW:** Let's look at number seven
20 which is radon exposure. I wasn't quite sure
21 how the radon exposure was actually handled.
22 Perhaps maybe if one of the ORAU people
23 explained how they did the radon exactly we
24 can comment on it further.

25 **MS. BLOOM (by Telephone):** I've gone back

1 and glanced at the data, and there were some
2 measurements in different areas of the process
3 that were used to come up with a distribution
4 of radon measurements. I want to go back and
5 look at those more closely. I oversaw the
6 calculational approaches but didn't look at
7 specifics in all instances. But I believe
8 that the data are very favorable to claimants
9 especially again considering that there is no
10 ore being handled during this later period.

11 But I do want to go back and check
12 when the measurements actually took place. I
13 did also go back and look at the Mallinckrodt
14 data where we have some measurements during
15 the later 1950s period when Mallinckrodt
16 stopped processing ore. And I looked at the
17 similarity of those exposures, and I think
18 that this is a reasonable number. But again,
19 I'd like to go back and check and not try to
20 argue it any harder one way or the other at
21 this time.

22 **DR. OSTROW:** This also brings up, I guess,
23 the question of the burlap bags again. I know
24 the African ore was just processed in the
25 early days during the SEC period. But the

1 question is what happened to the bags. Were
2 they taken off somewhere? Were they still
3 hanging around in the '50s? And if they still
4 had the African ore residues in it, they could
5 still be producing radon even into the '50s
6 period even though the plant wasn't processing
7 African ore anymore. So we're left with the
8 question, detective question, what happened to
9 the bags?

10 **MS. BEACH:** We talked about looking into the
11 records of when they burnt bags and possibly
12 that would give us some information.

13 **DR. OSTROW:** Yeah, yeah, that's part of the
14 detective story about what happened to the
15 bags.

16 **MR. CRAWFORD:** These bags were stored
17 outside?

18 **DR. OSTROW:** Yeah.

19 **MR. CRAWFORD:** Did you say that?

20 **DR. OSTROW:** They had tens of thousands that
21 were just piled up.

22 **MR. CRAWFORD:** Then exposed to the Buffalo
23 winter over a period of many years, and the
24 summer actually, there should be a lot of
25 bleaching and settling over such a time. But

1 what happens to burlap sitting outdoors for
2 five or six years in that climate? I'm not
3 sure either even if they're not burned.

4 **DR. NETON:** Well, it sounds like we
5 committed earlier to investigate this burlap
6 bag issue.

7 **DR. OSTROW:** Right, this sort of relates to
8 --

9 **DR. NETON:** And Cindy also suggested she was
10 going to go back and look at the radon data
11 and see what timeframe it covered. It's not
12 clear to me that these radon samples were all
13 taken before '47. I mean, I don't know. We
14 need to look at that and see if there's a
15 radon component. But certainly it is true
16 that the radon levels would be lower, and
17 should be lower, than what was measured during
18 the African ore processing. One would think
19 so.

20 **MS. BLOOM (by Telephone):** And a lot of
21 those measurements that were made during
22 processing were in closed areas of tanks where
23 you got the hundred, there were hundreds of
24 picocuries per liter values I should think.
25 They're not representative of what people

1 would have been exposed to on a long-term
2 basis.

3 **DR. MAKHIJANI (by Telephone):** This is
4 Arjun. How about the tailing areas for the
5 radon like on still winter days or something
6 like that?

7 **MS. BLOOM (by Telephone):** I want to go look
8 at that again, too, Arjun, because my
9 understanding is that the tailings went
10 offsite to that Ashland facility from the
11 domestic ores and the tailings from the
12 African ores went to Lake Ontario Ordinance
13 where I'm not sure exactly or I'm not sure
14 that any material with high specific
15 activities remained onsite. We do have some
16 later data that shows that there is some
17 radium in the soil, but I don't believe that
18 the concentrations are very high.

19 **DR. MAKHIJANI (by Telephone):** Yeah, if you
20 remember, material from Mallinckrodt --
21 correct me if I'm wrong, Jim -- but material
22 from Mallinckrodt was also sent to Lake
23 Ontario. It might have been a little later,
24 so it might have been onsite for some time,
25 but I haven't studied the Linde site very

1 much. I just went through it quickly to make
2 some comments for Steve.

3 **MS. BLOOM (by Telephone):** The K-65 from
4 Mallinckrodt did go to Lake Ontario.

5 **DR. ROESSLER:** The burlap bags with, we have
6 external coming up later, but on the internal
7 you're only concerned about the radon.
8 There's nothing else there?

9 **DR. OSTROW:** No, it also puts dust in the
10 air so it could be for the breathing it in
11 also.

12 **DR. ROESSLER:** So there's more to follow
13 through than just the radon on the burlap
14 bags? Was that a part of --

15 **DR. NETON:** Yeah, I think Cindy's going to
16 check into, if the bags were there, and they
17 had at one time contained the African ore,
18 then we have an issue with the entire K-chain
19 from uranium on down.

20 **DR. OSTROW:** So it may or may not be a
21 problem. It's just something that needs to be
22 investigated. I think we're finished with
23 issue seven then.

24 **ISSUE EIGHT**

25 Moving on, issue eight is the

1 raffinate trace radionuclides. And this
2 basically, we brought up the question of
3 raffinate traces were not adequately addressed
4 in the Linde site profile. And the response
5 we got back from ORAU was we concur there
6 might be issues of assigned non-uranium
7 intakes that have not been adequately
8 addressed. This will be reviewed further. So
9 that's fine. It's going to be looked into.

10 **DR. ROESSLER:** So that's a promise, and we
11 can go on to the next one.

12 **DR. OSTROW:** Right, the issue is taken care
13 of.

14 **ISSUE NINE**

15 Nine is this work hour thing again
16 which is, we have actually two different
17 places that we -- this is just, we have the
18 comment which may or may not be important.
19 It's not a big thing. But there were
20 different work hours assumed all over the site
21 profile, 40 hour weeks, 48 hour weeks, 54 hour
22 weeks, sometimes there's a one-hour lunch
23 break included or not included. They seem to
24 have worked six-hour weeks (sic) in general at
25 the plant and could have been eight-hour days

1 or nine-hour days six days a week, six days a
2 week.

3 **MS. BLOOM (by Telephone):** The work hours
4 changed as time went on and whether after the
5 war the number of days decreased for some
6 people. Depending on what job type you had
7 the hours were different. And I was just
8 looking at another contract that said thou
9 shalt not work longer than 42-and-a-half hours
10 per week. So the hours are all over the
11 place.

12 For the internal dose and looking at
13 bioassay this won't be an issue anymore. For
14 the external dose based on some badge data
15 this isn't an issue either because those are
16 integrated exposures.

17 **DR. OSTROW:** That's true.

18 **DR. BEHLING:** It would be an issue if you go
19 to the 33 MAC time-weighted because it be --

20 **MS. BLOOM (by Telephone):** I agree.

21 **DR. BEHLING:** -- different if you use five
22 days at nine hours a day versus six days
23 versus eight hours a day because the 33 MAC is
24 defined by the day as opposed to the hours.

25 **DR. ROESSLER:** Is that something that comes

1 up then after the evaluation --

2 **DR. NETON:** After evaluation of the
3 potential coworker model. If it's determined
4 we can't do a coworker model, then that
5 becomes an issue. But if a coworker model is
6 acceptable --

7 **MS. BEACH:** I just wrote down as an issue
8 because they were sitting on potentially
9 contaminated bags during their breaks and
10 lunch. It was one of the observations I made
11 by NIOSH's answer that this period included
12 lunches and breaks. But depending on where we
13 go with those contaminated bags, were they
14 routinely, it says on number 17 for years,
15 were sitting on that. So that was just one of
16 mine.

17 **DR. NETON:** Are you saying that they might
18 not be wearing their TLD badges then or film
19 badges?

20 **MS. BEACH:** Oh, they could. I'm sure that
21 they would be wearing it, but they wouldn't
22 have had that break period that would have
23 taken them out of a contaminated area if they
24 were sitting within that contaminated on those
25 bags.

1 **MS. BLOOM (by Telephone):** But the bioassay
2 and the badge both integrate the exposure.

3 **MS. BEACH:** Yeah, that should take care of
4 that.

5 **DR. MAKHIJANI (by Telephone):** Jim and
6 Cindy, but the external dose reading would
7 raise some kind of geometry issues similar to
8 what we had --

9 **DR. NETON:** Right, right.

10 **DR. MAKHIJANI (by Telephone):** -- before at
11 Mallinckrodt because you have, you know, the
12 lower torso parts of the body.

13 **DR. NETON:** Yeah, that's one of our
14 overarching science issues that we're
15 attempting to address which is non-uniform,
16 parallel-beam geometries. Agreed.

17 **DR. ROESSLER:** So that's taken up in issue
18 14, another issue along the line of --

19 **DR. NETON:** I think the issue of non-uniform
20 exposure geometry is being taken up as a site-
21 wide, complex-wide issue at this point and
22 will be addressed out of the context of this
23 profile review. I mean, it will be
24 incorporated eventually once we came to a
25 determination of how to deal with it.

1 **DR. WADE:** But you captured his comment.

2 **DR. LOCKEY:** John, is that adjusted with an
3 eight hour time-weighted average in the New
4 York review?

5 **DR. MAURO:** It was represented as a time-
6 weighted item. I don't know if it's eight.

7 **DR. LOCKEY:** Do you know the sampling time?
8 Do they give you a sampling time? Do they
9 have sampling times on there?

10 **DR. MAURO:** The data is not that detailed.

11 **DR. NETON:** They would sample the workers
12 whenever they worked. I mean, they would
13 follow the worker around all day.

14 **DR. OSTROW:** Yeah, there were sample type
15 things.

16 **DR. LOCKEY:** Thirty minutes here?

17 **DR. NETON:** They would represent their
18 entire work processes during the day in little
19 blocks of time.

20 **DR. MAURO:** In theory if the guy they
21 followed that worked ten hours, then whatever
22 he did.

23 **DR. LOCKEY:** They'd follow them for ten
24 hours if they were there for ten hours to
25 capture whatever he worked.

1 **DR. OSTROW:** Yeah, the report doesn't give
2 any sort of detail on that though. I mean,
3 you're right. There's no data on that.

4 **DR. NETON:** Based on past observations of
5 these types of studies that have been done,
6 they would follow the worker around the whole
7 day. At least capture a representative block
8 and then figure out he worked 15 minutes here,
9 four hours here, three hours there. That sort
10 of thing.

11 **DR. OSTROW:** That's also the point. This is
12 all done on one day, right?

13 **DR. NETON:** One week.

14 **DR. OSTROW:** One week, so in one week they
15 did all this. I don't know how representative
16 one week is in the history.

17 **MS. BLOOM (by Telephone):** I think this was
18 factory type work, and it probably was fairly
19 representative which isn't to say that things
20 didn't change over time, but I think they went
21 in to try to find very representative
22 conditions.

23 **DR. LOCKEY:** It wasn't enforcement, right?
24 Is that correct?

25 **DR. MAURO:** No, this was, at that time all

1 that the NYOO 1949 report captures the down-
2 and-dirty underbelly of what the heck was
3 going on in those days before they really took
4 some serious steps to clean up. That's how I
5 see it.

6 **DR. OSTROW:** I agree, John. I just read
7 this yesterday quickly, but they mentioned
8 that Linde needs to be cleaned up; however,
9 they don't think it's going to happen because
10 they're going to stop processing soon anyway.
11 So they're not going to do it basically.

12 **DR. LOCKEY:** That was after the sampling was
13 done.

14 **DR. OSTROW:** Yeah, yeah, it was like a
15 comment made in the report on that. Because
16 they were supposed to shut down operations
17 anyway soon.

18 **MS. BEACH:** And that was done in the year
19 1949?

20 **DR. MAURO:** The report came out in '49.
21 Yeah, and they give you the dates when the
22 actual sampling was done. It was done -- here
23 it is, from October 26th to November 2nd, 1948.
24 That's when they actually went out there. So
25 it was a one-week period, but you're right.

1 You'd normally expect that if their real
2 intention was to get a snapshot of what's
3 going on out there; let's see if we can make
4 things better, they would have tried to do a
5 good job. And these were the best there were.
6 I mean, I, these are the people, guys like
7 Merril Eisenberg, (unintelligible) Cassidy.
8 These were the people who were the forefathers
9 of the whole industry were there. So, I mean,
10 I'm --

11 **DR. LOCKEY:** Can you send a copy? Is that
12 available?

13 **DR. MAURO:** I have it right here. The copy
14 is electronically, yeah, I got it off the web.
15 You guys put it up. It's on your web. I'm
16 trying to think of where I found it, the NYOO
17 report, this report. The New York Operations
18 Report. I call it the 1949 report.

19 **MR. ELLIOTT:** As we, as these documents are
20 introduced, we need to make sure there's a
21 folder on the O drive.

22 **DR. NETON:** I think it's out there, but I --

23 **DR. MAURO:** It's out there.

24 **MR. ELLIOTT:** Well, we'll send an e-mail out
25 and let everybody know where this is at.

1 **MS. BEACH:** Yeah, that'd be great.

2 **DR. ROESSLER:** So what you're saying, John,
3 is you're confirming the importance and
4 validity of this database. There's no bias or
5 anything like that.

6 **DR. MAURO:** I think that this was a genuine
7 effort made by the New York Operation Office
8 under the auspices of the Atomic Energy, the
9 newly formed Atomic Energy Commission to get
10 out there and clean up their act. They felt
11 that there were all these private companies
12 out there doing all this important work that
13 did not have (unintelligible). And they
14 actually said if you read the text. It's
15 right in the introduction. So this was a
16 nightmare. These places were filthy. There
17 were given no good controls. The exposures
18 were, I mean, it's right in the beginning. It
19 says that. And here's all the data that
20 characterizes it.

21 **DR. ROESSLER:** Answer my question. You feel
22 that the database is valid?

23 **DR. MAURO:** Yes.

24 **DR. ROESSLER:** And that it is not biased?

25 **DR. MAURO:** I feel the database is valid to

1 the extent that one week's sampling of worker
2 activities captures the full range of
3 activities. But I think that was an attempt
4 to be as valid as you can make it.

5 **DR. LOCKEY:** One interesting thing they
6 answer other questions is the way they looked
7 at the work records during that timeframe and
8 to see if this was representative of the hours
9 worked during the weeks during the month
10 during that timeframe.

11 **DR. NETON:** That'd be tough to do. I don't
12 know if we have that.

13 **DR. BEHLING:** I have a question, John, what
14 were the dates (unintelligible).

15 **DR. MAURO:** Late '48.

16 **DR. BEHLING:** No, no, not the year but the
17 timing --

18 **DR. MAURO:** End of October, the beginning of
19 November 1948.

20 **DR. BEHLING:** Okay, because one of the
21 things that we do learn is that during those
22 years air conditioning was not existent and
23 ventilation was questionable. Warmer times of
24 the year there was obviously the windows were
25 open. The doors were open, and so it does

1 have a seasonal aspect to it.

2 **DR. MAURO:** Absolutely, and that's why this

3 --

4 **DR. NETON:** I think this has a great point
5 that we have the 700 bioassay samples we can -
6 - the coworker model and see how that fares
7 against the 33 MAC value that they calculated.

8 **DR. MAURO:** This is going to validate. See

9 --

10 **DR. NETON:** My guess is we're going to come
11 out lower but I don't know.

12 **DR. OSTROW:** And I agree also that the
13 bioassay is much better. You have decent
14 data. It's a good answer to a lot of these
15 questions.

16 **DR. NETON:** But it's a good, a great
17 opportunity though to sort of validate what
18 they've done.

19 **DR. MAKHIJANI (by Telephone):** Jim, this is
20 Arjun. In the validation exercise I guess if
21 you're trying to match them up, you'd have to
22 have some knowledge of the solubilities and --

23 **DR. NETON:** Yeah, I guess validates probably
24 not the right word, Arjun. I think just to
25 compare the two values, we would, of course,

1 use both solubilities. I don't know if we
2 would. We could use both solubilities, but
3 you don't know, for example, if the workers
4 did, if the workers did wear respirators, then
5 that 33 MAC value is not a good comparison to
6 begin with.

7 So all that we can do is to compare it
8 and show that it looks like the urinalysis
9 data possibly, if it's a good, valid coworker
10 model, comes out and has an exposure that's
11 either equal to or smaller than the value that
12 was, you know, that you would infer from the
13 33 MAC.

14 **DR. MAKHIJANI (by Telephone):** I agree with
15 you.

16 **DR. NETON:** You know, you've got particle
17 size issues. If these are five, ten, 15
18 micron particles, it's clearly been shown in
19 past studies that the urine -- the respirable
20 fraction is much smaller than what's in the
21 particle sizes that are, the air samples that
22 are used so there's a lot of caveats here. We
23 have a problem I think if it comes out that
24 the coworker urine model shows a higher level
25 of MAC exposure than what was measured in this

1 study that would be not a good outcome, but
2 we, of course, would have to deal with it at
3 that point.

4 **DR. ROESSLER:** So it appears on issue nine
5 that because it's not an issue right now in
6 the internal or external that the work hours
7 would be taken into consideration by both the
8 bioassay and the film badges. Is that the way
9 you read this then?

10 **DR. OSTROW:** Yes.

11 **ISSUE TEN**

12 **DR. ROESSLER:** So now we've kind of lopped
13 into issue ten, I think, if we're done with
14 issue nine.

15 **DR. OSTROW:** Ten is easy because I think
16 we've reviewed it. I discussed it with John,
17 and I think we should withdraw issue number
18 ten. We decided that's not an appropriate
19 issue.

20 **DR. ROESSLER:** So you want to withdraw it
21 completely?

22 **DR. OSTROW:** Yes. We discussed that.

23 **DR. ROESSLER:** Does everybody, anybody have
24 any comments?

25 **DR. NETON:** No comments.

1 **DR. ROESSLER:** Give me a concise statement
2 as to why you withdrew it.

3 **DR. MAURO:** If the 33 MAC is, in fact, a
4 plausible upper bound, there's no reason to be
5 concerned with the uncertainty in that number.

6 **ISSUE ELEVEN**

7 **DR. ROESSLER:** Okay. So then how about
8 issue 11?

9 **DR. MAURO:** Eleven's a good one.

10 **MS. BEACH:** Can we go really quick back to
11 ten? So the ventilation and all that stuff is
12 not an issue? Because that was one of the
13 ones that was in ten, poor ventilation, non-
14 existent -- does that cover all that then?

15 **DR. MAURO:** This goes back to the 33 MAC.

16 **MS. BEACH:** Okay, so it will be covered
17 there?

18 **DR. MAURO:** Yeah, if the 33 MAC, if we
19 didn't have the bioassay data and that's going
20 to let us know, right now the position that
21 NIOSH has taken, and that we tended to agree
22 with, is that the NYOO report was a good -- in
23 other words if you have all this data. You
24 have 21 different categories of workers at
25 Linde alone. That's just Linde. They did it

1 for seven different facilities. At Linde
2 alone they picked the worst category which had
3 33 MAC. It seems to me that that ain't bad
4 except for the problems that Hans brings up.
5 If they happened to pick a week that was in
6 the winter or the summer, and this sounds like
7 it was in the winter, it may have been closed
8 conditions up at Linde --

9 **MS. BEACH:** Worst conditions.

10 **DR. BEHLING:** No, no, if you look at
11 Fernald, the worst of the hot summer days when
12 they left doors wide open --

13 **DR. MAURO:** And the wind blew through.

14 **DR. BEHLING:** -- fugitive emissions were
15 blown throughout the whole facility. The
16 summer is probably the worst time.

17 **MS. BLOOM (by Telephone):** I think it would
18 change depending on the facility from day to
19 day and whether you had inversions and all
20 sorts of things. And it would be a tough
21 call. But I think again you're talking about
22 a fluorination process here where there were
23 ventilation, mechanical ventilation added to
24 the systems to reduce worker exposures, to
25 reduce wear and tear on equipment. There were

1 issues about the acid concentrations in the
2 air. So I don't think it's reasonable to
3 assume that ventilation was nonexistent or
4 worse than at other facilities.

5 **DR. ROESSLER:** What about number 11?

6 **DR. OSTROW:** Eleven issue requires some
7 discussion. This comes up actually the same
8 similar issue in 11, 15 and 20. It's tough so
9 I will read them, about the use of geometric
10 mean values where it's appropriate and where
11 it's not appropriate. And based on our
12 reading of this it looks like the response to
13 issues 11 and 20 contradict each other at
14 least partially.

15 It looks like issue 20 took into
16 account or mentioned that the response,
17 mentioned the OTIB-20, which was released
18 after the site profile was done in October
19 '05, where there's three different categories
20 of exposure. And that wasn't factored into
21 the response to issue number 11 here.

22 **MS. BLOOM (by Telephone):** OTIB-20 only
23 applies to external dose. It does not apply
24 to the radon information. Again, a lot of
25 these were process samples and samples taken

1 at surfaces not where people's breathing zones
2 were. And I said I plan to go back and look
3 at these again.

4 **DR. MAURO:** I think this is almost a generic
5 issue. Our understanding is that in
6 responding to number 11 where we raise this
7 question about the geometric mean, the answer
8 basically came back, well, it is standard
9 policy to use the full distribution or the
10 geometric mean as a reasonable representation
11 of what a given worker may have been exposed
12 to.

13 Now it is our understanding -- and,
14 Jim, please correct me if I'm wrong -- that
15 that approach was something that was adopted
16 very early on because I remember that was an
17 issue that we confronted when we dealt with
18 Bethlehem Steel. Subsequent to that a
19 somewhat more claimant favorable philosophy
20 has been embraced whereby there are certain
21 conditions, yes, when you'd use the full
22 distribution of a given dataset as a surrogate
23 for a person who wasn't monitored.

24 So if you have a person who wasn't
25 monitored, and you want to reconstruct his

1 dose, whether it's external or internal -- I
2 guess I'll take it to that extent -- whether
3 it's external or internal, you have to ask
4 yourself some tough questions. Do I apply to
5 this person the full distribution or do I
6 apply to this person the upper 95th percentile
7 value? And the answer that was provided in
8 number 11 seems to have come back with the old
9 school. Well, we could apply the full
10 distribution or the geometric mean. I don't
11 think that's the case any longer.

12 **DR. NETON:** First of all this document was
13 written before any of those concepts had been
14 fleshed out. I know the answer is current,
15 but Cindy's right. The TIB-20 only applies to
16 external dose issues, and in particular,
17 penetrating dose, photons, photon dose.

18 We still do not have a generic
19 position for internal because we feel that
20 it's more, it's not as clear cut as in the
21 external arena. For example, in the
22 Department of Energy facilities, if you adopt
23 a carte blanche position that all workers
24 should receive the 95th percentile who weren't
25 monitored for internal dose, you're in the

1 position of assigning more dose to the
2 unmonitored workers than 95 percent of the
3 monitored workers. It just doesn't sit well
4 with us.

5 I think we have not put a policy in
6 place because we'd like to evaluate this on a
7 case-by-case basis. There are situations, and
8 this may be one of them, where the 95th
9 percentile of internal makes some sense. We
10 just have to look at the data and see what it
11 says.

12 Somehow if we can document that the
13 highest exposed workers were monitored --
14 we've not been very successful in convincing
15 you folks that that's true, but say that we
16 could come to that agreement -- then we
17 certainly wouldn't apply the 95th percentile to
18 those. So I think we're in agreement. It's
19 just that the official policy for external is
20 in place, but we did not put that --

21 **DR. MAURO:** Well, that wasn't articulated
22 in, the only reason I'm bringing it up, in the
23 response to our question number 11, what you
24 just described wasn't articulated, but it was
25 later on dealing with external. And I

1 understand.

2 **DR. NETON:** We're not against the 95th
3 percentile, we just want to use it judiciously
4 in internal exposures.

5 **DR. ROESSLER:** So what have we done with 11
6 and 20? I don't think we've even looked at
7 15.

8 **DR. OSTROW:** Are you going to try to develop
9 some position for this or are we just going to
10 continue looking on a case-by-case --

11 **DR. NETON:** Right now it's a case-by-case
12 basis. It'll be a position for this
13 particular site that we'll adopt.

14 **MS. BLOOM (by Telephone):** I think I can
15 think of an example where you're talking about
16 perhaps data, and this is not for this
17 particular site but the St. Louis airport site
18 where they have radon measurements on top of
19 the piles out there. And you might choose to
20 make those a distribution or you might choose
21 a 95th percentile. But for that particular
22 site because people aren't out there, the
23 distribution would be much more reasonable.
24 And to prescribe using the 95th percentile
25 wouldn't be reasonable because people aren't

1 out there all the time.

2 **DR. NETON:** Right, that's a good example.
3 Another one that comes to mind is Chapman
4 Valve. We had so few bioassay data points
5 that we took the highest value we could find.

6 **MS. BLOOM (by Telephone):** And we went the
7 opposite way on that one.

8 **DR. NETON:** So it depends on the individual
9 situation what we feel using our professional
10 judgment gives the claimants the fairer shake.
11 Although if we could put it all in one place
12 it would be better. I would agree that, you
13 know, if we could consolidate all into one --

14 **DR. MAURO:** On a case-by-case basis what
15 happens then is, of course, then you have to
16 make your case why in this particular case we
17 did this. So I think it's going to be, you
18 know, and you have to review a lot of data and
19 make your arguments on a case-by-case basis.

20 **MR. ELLIOTT:** And maybe we've got to make
21 sure we do it consistently where it's
22 appropriate.

23 **DR. NETON:** I'm not saying that we wouldn't
24 entertain making a policy in one document, but
25 right now I don't know that we've got enough

1 sense as to put it all in one place and make a
2 generic document.

3 **DR. OSTROW:** Okay, I think that takes care
4 of 11, and I think 20 also again.

5 **DR. ROESSLER:** And 15, I imagine we'll wait
6 until we get there?

7 **DR. OSTROW:** Yeah, 15, maybe yes, maybe no.
8 I have to see what it is.

9 **DR. NETON:** Did we skip over 13?

10 **ISSUE TWELVE**

11 **DR. ROESSLER:** We haven't done 12 yet.

12 **DR. OSTROW:** Okay, this one also is related
13 to the 33 MAC. This goes away if 33 MAC
14 really is an upper bound, and if you're going
15 to be using the bioassay data which could be
16 even better than you don't need a
17 comprehensive uncertainty analysis. This
18 relates also to the 33 MAC and the bioassay.

19 **ISSUE THIRTEEN**

20 **DR. ROESSLER:** And 13, right?

21 **DR. OSTROW:** My comment basically here is I
22 didn't understand, well, literally it might be
23 my problem, how some of the external dose was
24 done. It's a scheme that's quite complex, and
25 I had read several paragraphs. I just

1 literally could not understand them. Maybe it
2 would be clearer to the dose reconstructor or
3 the people who wrote it, but I just literally
4 couldn't understand it.

5 **DR. ROESSLER:** You're talking about just the
6 missed occupational dose?

7 **DR. OSTROW:** Yes, for 13.

8 **DR. ROESSLER:** Missed external dose.

9 **DR. OSTROW:** Yes, excuse me.

10 **DR. ROESSLER:** What do we need to clarify on
11 that?

12 **DR. OSTROW:** I think if the -- going to
13 comment, I have one example, but I think it's
14 if the TBD is revised, just parts of it should
15 be rewritten. That's my comment on it,
16 editorial things. I'm not saying it's wrong.
17 I swear I couldn't understand it.

18 **MR. ELLIOTT:** It's complex, and you didn't
19 have a clear understanding of what the
20 approach was.

21 **DR. NETON:** So, Cindy, would it be too
22 difficult for you to explain in simple terms
23 here exactly the approach?

24 **DR. OSTROW:** Simple enough for me, please.

25 **MS. BLOOM (by Telephone):** I think that the

1 approach that was taken in this rework was to
2 try to use every piece of information
3 available to develop a very well reasoned and
4 complete argument as to what the doses were.
5 In the final hour reviews came back that
6 indicated this has to be usable by dose
7 reconstructors as well.

8 And so we went and in order to not
9 lose information but to make a more simplified
10 approach, we came up with the table in the
11 last section of the external section. But I
12 think this is always, you know, how simple do
13 you make your assumption so it's readable and
14 people don't have to go back through all the
15 pieces and parts of data versus how accurate
16 do you want to be in terms of presenting all
17 that information. And it's a challenge to say
18 the least.

19 **DR. OSTROW:** I think the comment was also
20 that the, it wasn't clear at all times the
21 distinction between the sort of background
22 information. You present a lot of data,
23 background data, and then you came up with the
24 conclusions that the dose reconstructor could
25 use. It wasn't always clear reading it the

1 distinction between the two, whether the dose
2 reconstructor is actually supposed to use a
3 particular piece of data or this is just some
4 point of information that's not going to be
5 used.

6 **MS. BLOOM (by Telephone):** What we actually
7 tried to do was to make that last summary
8 table the place where unmonitored workers'
9 doses would be found so dose reconstructors
10 didn't have to dig into the details of how
11 that information was developed. But I don't
12 see this as a small task to rewrite this
13 section, but it certainly can be done.

14 **MR. ELLIOTT:** Has there been guidance given
15 to dose reconstructors that's not in the
16 technical basis document or has guidance been
17 given for dose reconstructions for Linde in a
18 workbook fashion or is there something else we
19 could rub off against the language in the
20 technical basis document, against, that would
21 help people understand how the approach works?

22 **MS. BLOOM (by Telephone):** I have not seen
23 or heard of any guidance although some of this
24 might be included in a workbook. But I think
25 I did look at one dose reconstruction that

1 SC&A had reviewed, and I found that the dose
2 reconstructor had actually made it look very
3 easy when they said we're going to find the
4 maximum dose in this table. We're going to
5 apply it, and now we're done, and so that
6 particular case looked very simple. But I'm
7 not aware of any other information.

8 Is anybody there that might be able to
9 answer that?

10 **MR. CRAWFORD:** One interesting factoid is
11 that of the 230 cases that NOCTS shows having
12 been filed, 130 have already completed dose
13 reconstruction. So apparently it hasn't been
14 an inexplicable TBD. It has been used. We
15 have a 51-1/2 percent compensability rate for
16 those who had the --

17 **DR. NETON:** Table 36 is what they're using
18 here, and I guess the question is does SC&A
19 have an issue with those being bounding doses.
20 They're pretty large doses if you look through
21 the table of external gamma dose for workers,
22 three rem, 1.6 rem, 1.7 rem, and those are
23 fairly high doses for a uranium facility.

24 **DR. OSTROW:** Gen, I don't know of any, at
25 least I didn't have any issues with Table 36,

1 the final results. As you mentioned they are
2 pretty high. We just had some trouble --

3 **DR. NETON:** Understanding.

4 **DR. OSTROW:** -- but we were trying to figure
5 out where all the numbers came from in some
6 cases.

7 **MR. CHAN (by Telephone):** I think, Steve, I
8 have a recommendation. This is Desmond Chan
9 again. If you go to our report in Table 5
10 dash three on page 58. We tried to actually
11 track Table 36 back to all the other tables,
12 and I think there's a few places we cannot
13 trace back to the sources. And also I think
14 part of the big concern that when we review
15 all this tables, I think the basis of most
16 numbers came from one of the survey readings
17 early in the '50s after the flushing and the
18 cleaning of the Building 30. And then that
19 number was used as the basis for all the other
20 numbers.

21 **MS. BLOOM (by Telephone):** No, no, no, that
22 was --

23 **MR. CHAN (by Telephone):** I think that
24 probably is what the question will be, you
25 know, for you, Cindy. Maybe we misread it.

1 **MS. BLOOM (by Telephone):** No, I think there
2 are a lot of different time periods addressed
3 in there.

4 **MR. CHAN (by Telephone):** Right, right.

5 **MS. BLOOM (by Telephone):** There's the time
6 period before work started up at the ceramics
7 plant which is different from the Tonawanda
8 laboratory.

9 **MR. CHAN (by Telephone):** Yes, there's two
10 separate, you know, tracks there, yeah.

11 **MS. BLOOM (by Telephone):** And there's a
12 period where they were handling African ore at
13 both facilities. There's a period where there
14 was a clean up and a standby period. Then
15 they started up operations with U-02 again.
16 And then there was another clean up period.
17 So it's not a simple site to address.

18 The early data is based on, as you
19 mentioned, some information related to a clean
20 up survey that was thought to be a reasonable
21 basis for capturing both the ceramics plant
22 contamination which there was no uranium being
23 used at the ceramics plant itself yet in the
24 early days, and was also used for the later
25 period of operations. Source term information

1 was primarily used for the early African ore
2 days, and then later we have some film badge
3 data that was available to estimate doses for
4 the U-02 operational period.

5 **MR. CHAN (by Telephone):** I do agree with
6 you. I think when you go back and look at all
7 the tables, and I think we actually tried to
8 map Table 36, the data came from at least
9 seven or eight other tables, Table 15, Table
10 21, 35, 18, 33, and they all fit into that
11 summary table I assume the dose reconstructor
12 can use. And in a few places like, you know,
13 I mentioned in Table 5.3 and then 47 for the
14 ceramic plant, we cannot track back to any
15 other tables. And the same with 1949 for the
16 neutron dose, we cannot track back to the
17 sources. So I assume that maybe we --

18 **MS. BLOOM (by Telephone):** 'Forty-nine was
19 not calculated. The 1949 was based on source
20 term data, and there's actually a neutron
21 section in there that explains how those were
22 calculated using OTIB-24.

23 **DR. ROESSLER:** We've been asked to take a
24 break soon. Can we bring this particular
25 issue to a close? Is there a recommendation

1 as to what needs to be done to clarify this?
2 Is it editorial or is it okay?

3 **DR. LOCKEY:** Let me ask a question. Do you
4 feel that the boundaries put on one amount of
5 workers is claimant favorable?

6 **DR. OSTROW:** Well, looking at the final
7 numbers you have in your Table 36, they look
8 good. They're high numbers. They're probably
9 claimant favorable. We just had trouble sort
10 of doing a QA on it, trying to figure out
11 where some of the numbers came from. You
12 know, if they came from some of the other
13 tables, then reading the text, but I'm having
14 trouble trying to interpret the text also in a
15 couple of cases. We're not claiming that
16 they're wrong. It's just that they're hard to
17 interpret.

18 **MS. BLOOM (by Telephone):** I guess from
19 where I sit I'd like a minute to maybe -- not
20 today but over the next week -- go back and
21 talk to OCAS about what this would take to, I
22 think the documentation, we could make an
23 attempt to write it more clearly. I know I've
24 reviewed and used this a lot of times and
25 tracked the numbers through, so I think it can

1 be done.

2 And if all we need to do is write it
3 more clearly, that's one thing. If we need to
4 go back and maybe simplify the approach in
5 general because it's so complicated that even
6 if we write it more clearly, reviewers are
7 going to be frustrated, then I think the
8 answer is different. I'd like to be able to
9 talk to NIOSH before we decide on a path
10 forward on this.

11 **MR. CHAN (by Telephone):** Cindy, maybe I
12 have a recommendation. I think from a
13 reviewer's standpoint maybe you just even work
14 on Table 36 and have a lot of footnotes and
15 where the numbers come from. That may be
16 enough.

17 **MS. BLOOM (by Telephone):** Yeah, I think we
18 have 13 footnotes associated with that table.

19 **MR. CHAN (by Telephone):** Yeah, but there
20 are still kind of gaps in there that we cannot
21 be able to track, but that may be able to fill
22 the gaps. That's all my recommendation is.

23 **MS. BLOOM (by Telephone):** Okay, I'm looking
24 at the wrong table anyway.

25 **MR. ELLIOTT:** What about some example dose

1 reconstructions which would apply the use of
2 the table and walk people back through it.

3 **DR. MAURO:** No, that's not the problem.
4 See, I think that, in fact, this is a
5 recurring theme that we're running into. I
6 think that the final tool that says here's a
7 look up table. Use it, but to the dose
8 reconstructors. And they do. That's great.
9 And it may very well be a great tool and be
10 claimant favorable.

11 But you have to realize, we, on behalf
12 of the Board, have been asked do you believe
13 that the table that's been prepared is
14 technically sound and well based and good
15 science and good data. So we do our best to
16 go back and figure out the rationale, how they
17 got there. And very often we find ourselves
18 challenged to be able to figure it out.

19 I know Hans ran into the situation in
20 the story we told earlier where we talked
21 about this whole neutron to photon ratio and
22 what was really done. The story Hans told
23 represented taking all this information and
24 trying to sort it all out, and they could make
25 sense. So what you read really was an heroic

1 effort, quite frankly, to try to take a
2 massive amount of information and tell a
3 story.

4 Now, in Hans' case I think he managed
5 to break the back of the problem. He figured
6 it out, said, ah, I think I know what they did
7 now. In this case we weren't able to break
8 the back of the problem. We could not figure
9 out how he got there.

10 **MR. CHAN (by Telephone):** John, we did get
11 90 percent of the information together and
12 then how they put into Table 36. But we just
13 still have some missing link somewhere that's
14 all.

15 **DR. NETON:** Maybe that's the solution to
16 pose those questions to us that you're still
17 missing. Have us generically go and answer
18 all --

19 **DR. MAURO:** Fair enough.

20 **DR. WADE:** Maybe have a telephone call.

21 **DR. NETON:** Yeah, we could do a telephone
22 call or whatever.

23 **MR. CHAN (by Telephone):** We can do a
24 sidebar on this way.

25 **DR. NETON:** Because rather than have us

1 answer everything.

2 **DR. ROESSLER:** We reached a conclusion on
3 this one.

4 **DR. MAURO:** That's good.

5 **DR. ROESSLER:** So we're going to take how
6 long a break?

7 **DR. WADE:** We say ten minutes, and God knows
8 how long that could be.

9 **DR. ROESSLER:** So my watch says 25 to three,
10 so about quarter to or a little after.

11 **DR. WADE:** We're going to take a ten-minute
12 break. We're going to mute and come back on
13 in ten minutes.

14 (Whereupon a break was taken from 2:35 p.m.
15 until 2:45 p.m.)

16 **DR. ROESSLER:** Work group on Linde ready to
17 resume. I think we have resolved through
18 issue 13.

19 **DR. MAURO:** That's correct.

20 **ISSUE FOURTEEN**

21 **DR. ROESSLER:** And so let's go with 14 then,
22 Steve.

23 **DR. OSTROW:** Fourteen, we titled it "Film
24 Badge Data," and this one goes on here. This
25 is a question on, this is actually related.

1 This is a question on the Table 36 also
2 basically, and how Table 36 with all the
3 different components went into this. So if
4 I'm reading this correctly, my own comments
5 here, I think this is actually covered by what
6 we were just discussing about sort of the need
7 to explain how this Table 36 came about. What
8 the different components are in it.

9 **DR. ROESSLER:** Okay, so that one's --

10 **DR. OSTROW:** Fourteen, yeah, so 14 is
11 covered by the discussion we just had on Table
12 36.

13 **DR. MAURO:** And I also think it goes a step,
14 there's a second aspect to it. And that has
15 to do again, it appears that the Table 36
16 recommended value was a median for a
17 population of numbers that are being
18 recommended.

19 When using the median or the full
20 distribution, and this is external, I believe,
21 the question is should we be working with the
22 median as your surrogate for unmonitored
23 workers or should you be working off the 95th
24 percentile? So I think that this sort of goes
25 toward the conversation we had before.

1 So in addition to, I guess, the ball
2 is in our court to pose a focused question
3 regarding how did you do 36? This is what we
4 don't understand. And we'll do that. On top
5 of that we would like to put on the table that
6 how does the new, I guess, philosophy
7 regarding the use of 95th percentiles play on
8 Table 36?

9 **MS. BLOOM (by Telephone):** I think that's
10 addressed by Comment 20 that says we don't
11 feel that we incorporated our new direction,
12 and so we need to do that.

13 **DR. MAURO:** Okay, good, then we're in
14 agreement.

15 **MS. BLOOM (by Telephone):** Yes.

16 **MR. CRAWFORD:** To a certain extent it seems
17 to me that by locating the high, medium and
18 low exposed workers in the way you did, you're
19 informally breaking them up into groups. The
20 higher workers might need the 95th percentile
21 for unmonitored workers. So we just need to
22 make that more defined.

23 **DR. NETON:** Yeah.

24 **DR. MAURO:** Right.

25 **MS. BEACH:** I had a question regarding this.

1 Do we have a sense of what was happening
2 during that stand down period? It was a long
3 period of time. And was there any monitoring
4 done during that period? Because I know for
5 me stand down in my plant means you're doing
6 housework. You're cleaning. You're sweeping.
7 And I'm curious about that period of time, and
8 if there's any --

9 **MS. BLOOM (by Telephone):** I would have to
10 go back and look at the external data for that
11 period. I don't have the answer to that right
12 now.

13 **MS. BEACH:** Thank you.

14 **DR. NETON:** I'm sorry, I missed that Cindy.
15 Did you commit to looking at the stand down
16 period? Is that what we missed?

17 **MS. BLOOM (by Telephone):** No, I just said I
18 don't know the answer.

19 **DR. NETON:** Okay.

20 **MS. BEACH:** Well, it's just a long period of
21 time, and I was wondering if there was
22 monitoring done during that time as well.

23 **DR. ROESSLER:** Are you okay on that, Josie?

24 **MS. BLOOM (by Telephone):** I think there was
25 about a year, right?

1 **MS. BEACH:** Yeah, it was a little over a
2 year, 8/1/46 to 9/14, but they really didn't
3 start production until 11/47. So I'm
4 wondering what the workers did during that
5 time period and was there monitoring for
6 whatever they did or didn't do. Just a
7 question.

8 **MR. CHAN (by Telephone):** Cindy, I have a
9 question for the site profile Table 13. Do
10 you have it?

11 **MS. BLOOM (by Telephone):** Site profile
12 Table 13.

13 **MR. CHAN (by Telephone):** Yeah, that leads
14 into Table 36. I think that's the basis for
15 the beta dose, the beta-gamma dose which I
16 think I mentioned earlier. In 1949 there's a
17 survey done, and that survey number after
18 vacuum cleaning and flushing. That number's
19 been used as the basis for a few years of
20 external dose calculation.

21 I think it's a factor of three for
22 some reason used to, as a multiplier for the
23 survey data and to project back for before
24 vacuum cleaning, before flushing. So you use
25 the number to go back to 1948 and '47. So I

1 just do not know where that factor of three
2 comes from. Is it just a number you guys
3 decided to use based on some dose number
4 calculation?

5 **MS. BLOOM (by Telephone):** I would have to
6 look at that specifically again. I believe
7 there was, I have a vague recollection of data
8 from both time periods that Jerry Davidson
9 (ph) had looked at, and there was about a
10 factor of three difference, but I may be
11 thinking of the wrong --

12 **MR. CHAN (by Telephone):** Right, footnote C
13 on the table said assumed to be three times
14 higher --

15 **MS. BLOOM (by Telephone):** Okay.

16 **MR. CHAN (by Telephone):** Than the pre-
17 decontamination values. So I think it's an
18 assumption. So I just want to know the basis
19 for the assumption because it affects all the
20 other values because that is the basis for
21 everything else.

22 **MS. BLOOM (by Telephone):** Again, I think
23 that particular data only applies to a very
24 short period, but I'll have to look at that
25 again.

1 **MR. CHAN (by Telephone):** Okay.

2 **MS. BLOOM (by Telephone):** So it's the basis
3 of the factor of three for Table 13?

4 **MR. CHAN (by Telephone):** Right.

5 **DR. NETON:** It says right after that the
6 factor of three is based on the April 1949
7 data. See discussion in text.

8 **MR. CHAN (by Telephone):** Yeah, but I don't
9 see the discussion. I don't see the
10 justification or explanation why, what is
11 factor three from, and how they calculated the
12 factor of three. There's no explanation of
13 that.

14 **DR. ROESSLER:** So John will include that in
15 his focus question regarding Table 13.

16 **MR. CHAN (by Telephone):** Yeah. I think
17 that table eventually will fit into a few
18 places in Table 36, the values.

19 **MS. BLOOM (by Telephone):** I think that's as
20 you look at the before vacuum cleaning and
21 flushing and pre-decontamination. I'm going
22 to say that's where it is, but that's not
23 quite right either. I'll need to look at that
24 again.

25 **MR. CHAN (by Telephone):** Okay, thanks.

1 **DR. OSTROW:** Desmond, I think the conclusion
2 is we'll have to come up with a nice, concise
3 list of where, specifically of questions that
4 we have, and then I'll send them out.

5 **ISSUE FIFTEEN**

6 **DR. ROESSLER:** We can go to 15?

7 **DR. OSTROW:** Yeah. Fifteen deals with the
8 survey measurement data that's included in the
9 TBD. And this relates I think to number 20
10 that we talked about before, about the idea of
11 using the geometric mean values. And the
12 response said we believe that the application
13 of GSD of three to estimated unmonitored
14 worker exposures adequately accounts for bias
15 and uncertainty.

16 So the question, this is related to
17 the question before where they were looking at
18 the highest 95th percentile values or the time
19 average values. I mean, that's the way I read
20 it.

21 **DR. MAURO:** Yeah, I think this is the
22 recurring theme again. That is, when you work
23 with a geometric mean and the geometric
24 standard deviation as being a surrogate, in
25 this case it's external, we hearken back to

1 the 95th percentile question. Certainly there,
2 again, there are times when using the full
3 distribution makes sense, but there are times
4 when it may not.

5 But in this particular response it
6 seems like a generic position has been taken
7 that's contrary to the position that's
8 described later. So this is the same thing we
9 had before. Namely, the full distribution is
10 not necessarily the answer.

11 So if you have survey data, you have a
12 distribution of information, I don't think
13 you're done and just could automatically say
14 we're going to use that full distribution to
15 represent everybody, one size fits all. I
16 think that has to be used very cautiously the
17 way Jim described it earlier. I guess that's
18 all. So it's the same thing. I would say 15
19 is the same as the other two we talked about
20 earlier.

21 **MR. CRAWFORD:** Except that Cindy's
22 explanation here suggests that there's a
23 systematic bias in the survey data typically.

24 Break in if you want, Cindy.

25 That would lead us to over predict the dose

1 from these surveys because, as she says, they
2 tended to put the monitoring equipment where
3 they expected the most dose.

4 **DR. MAURO:** And if that case can be made for
5 all categories of workers, that's fine.

6 **MS. BLOOM (by Telephone):** Right, and this
7 is not a coworker data study. This is using
8 the measured doses from the workplace.

9 **DR. NETON:** Right.

10 **MS. BLOOM (by Telephone):** But we can look
11 at this again and as you know, make our case
12 and --

13 **DR. NETON:** Exactly, I think we just need to
14 be consistent with the new TIB-20 and we can
15 do what's right. We just need to document it
16 better I think.

17 **DR. MAURO:** Okay, fine, good.

18 **ISSUE SIXTEEN**

19 **DR. OSTROW:** Issue 16. This talks about
20 the, also did he capture the doses' time
21 weighted average business. Again, did he
22 capture the possible exposure to high dose or
23 high risk tasks. And the answer back is that
24 ORAU's not aware of any such high dose or high
25 risk task performed during the standby period.

1 If this is true, then it's okay. I mean, we -
2 -

3 **MS. BLOOM (by Telephone):** We're looking at
4 16 now?

5 **DR. OSTROW:** Sixteen, yeah. Basically,
6 Cindy, you looked at all different tasks and
7 you weren't aware of any particular high risk
8 tasks or high dose tasks?

9 **MS. BLOOM (by Telephone):** At this time I'm
10 not aware of any. That doesn't mean there
11 couldn't be any there, but I'm just not aware
12 of any.

13 **MR. ELLIOTT:** So, Cindy, this is Larry
14 Elliott. Is that based on the documentation
15 you've seen? In other words we haven't seen
16 any documentation that's contrary to that.

17 **MS. BLOOM (by Telephone):** Jerry Davidson
18 looked at this data really hard for over a
19 year trying to develop reasonable estimates of
20 exposures, and I haven't seen anything that he
21 put together. I haven't seen any of the
22 references, any information myself that
23 indicates that we missed something. But,
24 again, as I go back and look at the
25 information to develop some of this other

1 answers, I will look at this again.

2 **DR. ROESSLER:** Are interviews with workers
3 pertinent here? Is there any information on
4 that?

5 **MS. BLOOM (by Telephone):** We review all the
6 CATI responses. I also review the worker
7 outreach minutes when they become available.
8 There are some indications that during the
9 early years exposures were definitely very
10 high, and I think we've captured those in the
11 tables. I don't recall seeing anything that
12 we missed on a generic level, but we do look
13 at all that kind of information in developing,
14 the group that I work with, in developing the
15 AWEs. We check.

16 **MR. ELLIOTT:** Have we posed any questions
17 specifically to the standby era as to what
18 tasks were performed?

19 **MS. BLOOM (by Telephone):** I'm not aware of
20 any.

21 **DR. NETON:** This says 1946 to '47. Is that
22 not in the SEC period?

23 **MS. BLOOM (by Telephone):** Yes, it is.

24 **DR. NETON:** And so it seems the central
25 question here might be related to the SEC

1 period which has already been granted.

2 **MR. CHAN (by Telephone):** But this is
3 specific to the external though. The SEC is
4 dealing with internal, right? I assume.

5 **DR. NETON:** Right, good point.

6 **MS. BLOOM (by Telephone):** (Unintelligible)
7 brings most workers in at that point so you'd
8 have skin cancers and prostate.

9 **DR. ROESSLER:** Okay, so Cindy's going to
10 take another look at it, and does that cover -

11 -

12 **DR. OSTROW:** Yes, that's fine.

13 **ISSUE SEVENTEEN**

14 **DR. ROESSLER:** Okay, then let's go to the
15 fun one, issue 17, on the burlap bags.

16 **DR. OSTROW:** I think we discussed burlap
17 bags ad nauseum. We discussed that. It's
18 important for inhalation, might be, to look at
19 inhalations. It might be a direct dose also.
20 Especially if you have people sitting on them
21 it might be a skin cancer contributor or
22 potential --

23 **DR. NETON:** If we look at it from the
24 perspective of the ore itself, the progeny in
25 the ore in addition to the uranium.

1 **DR. OSTROW:** What bags were there when.

2 **DR. NETON:** It might be tougher to figure
3 out than we'd like, but we'll certainly look
4 at it.

5 **ISSUE EIGHTEEN**

6 **DR. ROESSLER:** Issue 18.

7 **DR. LOCKEY:** I'm sorry, what was resolution
8 16? I didn't catch that.

9 **DR. ROESSLER:** Cindy says she's going to
10 look through all this information again to
11 make sure that the approach for the, there
12 were no, maybe Chris or somebody else should
13 say this, high dose or high risk tasks that
14 need to be taken into consideration.

15 **DR. LOCKEY:** Is that going to be including
16 the stand down period for external?

17 **DR. ROESSLER:** Yes.

18 **DR. OSTROW:** Okay, issue 18 is the surrogate
19 external exposure data.

20 **MS. BLOOM (by Telephone):** Where are we now?

21 **DR. OSTROW:** Eighteen, issue 18.

22 This was a question, when we went back
23 to talking about that famous Table 36, it's a
24 similar type question. I said that the
25 process being used, a lot of different data

1 went into it, and it's complex. And we
2 weren't quite sure exactly how it was being
3 done in all cases. How the different things
4 were, we mentioned that they're, I think we
5 mentioned five different types of data that
6 were here: pre-clean up survey data, eight
7 solid ore sample data, one-day survey in six
8 locations, two one-day pre-cleanup survey data
9 after vacuuming, flushing, post-
10 decontamination survey data. We weren't quite
11 sure how all the pieces fit together here. So
12 we don't have a confident feeling that it was
13 all done sort of transparently.

14 **DR. MAURO:** We'd like to be in a position
15 where we can go to the original data sources
16 as referenced or provided, and then go from
17 there and stepwise reconstruct and match the
18 recommended numbers that you have in your
19 lookup tables. And need, we owe to you the
20 places where we were not able to do that. But
21 also at the same time, once we do that, once
22 we're at a point where, okay, now we
23 understand exactly what was done.

24 The other thing we owe is whether or
25 not we believe -- because right now we're

1 really sort of groping, whether or not we
2 believe that the construct for your system,
3 for surrogate external data adequately
4 captures these high end groups. Our recurring
5 theme over and over again is that, and we see
6 it all the time, is, yes, I think that you've
7 got all the data. Now we understand what you
8 did. We can match your numbers.

9 Then we have to ask ourselves the
10 question, based on that information do we
11 believe that all workers for different
12 categories of workers and that have different
13 functions, different places, are getting the
14 benefit of the doubt. Or is it possible that
15 the construct is only going to, is going to be
16 fair to 50 percent of the workers. In other
17 words if you work off the median or if you
18 work off the full distribution, I guess, we
19 owe you -- see, we're in a funny position.

20 We don't quite understand how you came
21 up with your construct, and once we understand
22 it, we'll be in a much better position to make
23 some constructive criticisms on whether or not
24 we believe that that construct is in fact
25 claimant favorable for the full array of

1 different categories of workers. Now one of
2 the problems we may run into is that we may
3 not have a full appreciation of the diversity
4 of work that took place.

5 So we may be left in a funny position
6 where we say, well, if we look at it all, and
7 we say, okay, I think we understand the full
8 range of the different kinds of activities
9 that took place. And it looks like the worst
10 category of activity from an external point of
11 view were people who did this. Given that is
12 there adequate data in the dataset that allows
13 you to construct a surrogate for that category
14 of people that we feel, yes, is given the
15 benefit of the doubt to that group of people.
16 And then we're done if the answer is yes.

17 But I don't think we're, because we
18 got sort of stopped midstream where we really
19 couldn't figure out how your construct came
20 about, we can't answer the ultimate question
21 for ourselves. We're sort of left in the --
22 'til we do that, so we're not home yet. That
23 is, after we pose it, we have this exchange on
24 Table 36 and these other tables where we say,
25 ah, okay, now I know what was done, how they

1 did it. I see the data that they used, and I
2 can match their numbers.

3 Then we're going to have to regroup
4 amongst ourselves and say, okay, does this do
5 the trick. Does it cap, in the end does it
6 provide a vehicle to give the benefit of the
7 doubt to that subgroup of workers that were
8 unmonitored that could have gotten high end
9 exposures. If we come away with, yeah, I
10 think it does, that's the end of the story.
11 Otherwise, we'll come back and say, no, I
12 don't think it does. So we really, we can't
13 achieve closure in one step. It's going to
14 take a couple of steps.

15 **DR. ROESSLER:** So the first step is for you
16 to come up with your questions.

17 **DR. MAURO:** Questions, and then we'll be
18 home, then we'll be on our way to closure.

19 **DR. OSTROW:** Issue 19, we discussed that
20 already. This is the work hour business.

21 **ISSUE TWENTY**

22 Twenty, this is the same issue we
23 discussed also, I think, with issue 11 and 15,
24 geometric mean business versus the,
25 distribution versus 95th percentile.

1 doses. Here I had misstated. I said the site
2 profile doesn't address missed occupational
3 and environmental doses to workers, and it
4 actually does. I was used to the other site
5 profiles where they have a separate section
6 for environmental. In re-reading it more
7 carefully, the TBD, it's there, but it's
8 blended in with the other stuff. It's not
9 like really separated out.

10 And this is like we discussed before,
11 the environmental outdoor stuff, where all the
12 piles of ore, waste piles, accounted for?
13 Whether, was the incinerator outdoor, the
14 incinerator that was --

15 **MS. BLOOM (by Telephone):** Excuse me,
16 somebody's turning papers near the microphone.

17 **DR. OSTROW:** I'll repeat that we discussed
18 this already. The issue is are all the
19 sources taken into account, the burlap bags,
20 the ore, the waste? Is there an incinerator
21 onsite? Was there an incinerator onsite?
22 When did it operate? Sort of these issues.
23 Were the sources identified and accounted for
24 correctly?

25 That's it.

1 **DR. ROESSLER:** Well, if you're satisfied
2 with 22, then are there any other issues that
3 we need to bring up to complete this?

4 **DR. OSTROW:** Arjun, did you have anything to
5 bring up?

6 **DR. MAKHIJANI (by Telephone):** I was gone
7 for a few minutes so I don't know what all
8 came up, but just I came back late after the
9 break. But the ore concentrate question in my
10 memory from the Fernald ore concentrate
11 processing time, the Thorium-230 seemed to go
12 along with ore concentrates or the radium got
13 left behind. Now, was that not the case at
14 Linde?

15 **MS. BLOOM (by Telephone):** I believe what
16 I've seen is that once you get to U-02, you
17 might have a little bit of thorium left there,
18 less than a half a percent by activity from
19 what I've seen in documents. And that we've
20 already agreed to go back and look at that
21 again.

22 **DR. MAKHIJANI (by Telephone):** Yeah, I think
23 if it's U-02, I would agree with you. I sort
24 of read concentrates, and so it came to my
25 mind.

1 **MS. BLOOM (by Telephone):** No, it's U-02
2 after 1947.

3 **DR. MAKHIJANI (by Telephone):** Okay, yeah, I
4 think some verification on that point would be
5 very important. And sorry that I missed that
6 you'd already said that.

7 **MS. BLOOM (by Telephone):** That's okay.

8 **DR. ROESSLER:** Is there any other question
9 or issue?

10 (no response)

11 **DR. ROESSLER:** It seems like what we need to
12 do now is put this on paper, and I'd
13 appreciate some help from some of you as to
14 what we resolved on each issue. The steps
15 that I see are that SC&A are going to prepare
16 their questions on the TBD Table 13 and 36,
17 deliver these to NIOSH.

18 And then NIOSH has a whole bunch of
19 assignments. Cindy has committed to a lot of
20 things.

21 **MS. BLOOM (by Telephone):** You better not
22 say that. You're going to get me in trouble,
23 Gen.

24 **DR. ROESSLER:** I heard you say it over and
25 over. What we need to get down on paper is

1 what you committed to. And I think the
2 important thing is then to look at a
3 timeframe, what's reasonable to expect from
4 SC&A on their questions to deliver to NIOSH.
5 And what does NIOSH think that the timeframe
6 would be to re-evaluate all these issues.
7 Really they're several, one big one, and then
8 maybe some better documentation then.

9 Does anybody have any comments? I
10 think this we owe to the Board and the people
11 on the telephone.

12 **DR. BEHLING:** Who's going to do the analysis
13 of the bioassay? Because I consider that the
14 single most important issue.

15 **DR. NETON:** We'll do that.

16 **DR. ROESSLER:** Do you have some feeling for
17 a timeframe on it?

18 **DR. NETON:** Well, I think we need to talk
19 among ourselves. I don't want to give a
20 timeframe right now. If we put out maybe a
21 draft of what these action items are, we could
22 fill it in. I need to talk to Cindy and
23 workloads and the issues on the table right
24 now.

25 **DR. ROESSLER:** So we will work together then

1 on the issues.

2 **DR. NETON:** I wish I could give you a
3 timeframe now but I'm not prepared to do that.

4 **DR. ROESSLER:** Perhaps by the next Board
5 meeting or Board phone call we can have that.

6 **DR. NETON:** Well, certainly well in advance
7 of that, the Board call, by April 5th.

8 **DR. ROESSLER:** That sounds reasonable.

9 **DR. BEHLING:** Is the intent, Jim, to use the
10 bioassay data as a way of replacing the air
11 sampling data --

12 **DR. NETON:** Yes.

13 **DR. BEHLING:** -- or to confirm the air
14 sampling data?

15 **DR. NETON:** No, the ultimate intent would be
16 to use it to replace the air sampling data if
17 we can determine that it's a valid set, and
18 it's a lognormal and all the good caveats that
19 go along with that. And if that does, then
20 many of these issues drop off the table. But
21 I need to talk to Cindy and the others to
22 figure out how much time she has. It takes
23 longer to construct one of these coworker sets
24 than one would think even though we've done it
25 many, many times there's a lot of issues to

1 deal with.

2 **DR. MAURO:** From my perspective in terms of
3 communicating back to NIOSH the questions we
4 have so that we could fully appreciate Table
5 36 and the whole, that might work, rather than
6 try to write it down, is it possible that we
7 could have our reviewers talk to your people
8 directly and say, okay, I don't understand how
9 you got this number. Could you walk me
10 through it? And that might be a lot easier,
11 just one phone call, may last an hour or two.

12 And once we have a full appreciation
13 of, okay, I think I understand what was done,
14 then what we can do is perhaps put an e-mail
15 out to the working group that says, okay, we
16 understand. Here's the answer. And then we
17 can also say something about whether or not
18 the follow on issues are concerned or have
19 been resolved.

20 In other words I understand what they
21 did, and I think they've captured the high end
22 group. Or I understand what that did, and I
23 don't think they captured the high end group.
24 But at least we'll be able to get it to that
25 point, and then we'll deliver that to you and

1 the rest of the working group.

2 DR. ROESSLER: It sounds like in priorities
3 with time it seems like that would work best.

4 DR. MAURO: I think that can go pretty
5 quickly.

6 DR. OSTROW: Well, John, I think we have to
7 write it down though first even before the
8 teleconference.

9 DR. MAURO: No, among us, yeah.

10 DR. OSTROW: I think it would be probably
11 rather than spring it on the --

12 DR. MAURO: Okay --

13 DR. OSTROW: -- we should send them a copy
14 and say we don't waste time that way.

15 DR. NETON: You can coordinate with Chris.

16 DR. OSTROW: Because a lot of this stuff is
17 very specific like what did you mean in the
18 third sentence of this paragraph.

19 MR. ELLIOTT: Yeah, I think if you could get
20 it said in advance it would certainly prepare
21 us to be more responsive in the time you'd
22 have to spend together on the phone.

23 DR. WADE: The Chair can be on the telephone
24 call if you'd like.

25 DR. NETON: Yeah, the working group members

1 are invited to participate in these calls but
2 not required, at least that's the way it's
3 been in the past.

4 **DR. ROESSLER:** So is there anything else we
5 need to consider, Lew or Emily?

6 **DR. WADE:** I think it's an activity and then
7 maybe during the April 5th call you can do a
8 little bit better forecasting to the Board as
9 to what they might expect when you do your
10 work group report. But it was a very
11 productive day.

12 I think you did a masterful job of
13 leading the folks here.

14 **DR. ROESSLER:** Pushing them.

15 **DR. WADE:** Would they were all this smooth.

16 **DR. ROESSLER:** Then I think we're adjourned.

17 (Whereupon, the working group meeting
18 concluded at 3:15 p.m.)

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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 day of March 26, 2007; I, Steven Ray Green, then transcribed the proceedings, 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 22nd day of July, 2007.

STEVEN RAY GREEN, CCR**CERTIFIED MERIT COURT REPORTER****CERTIFICATE NUMBER: A-2102**