

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

MOUND

The verbatim transcript of the Working  
Group Meeting of the Advisory Board on Radiation and  
Worker Health held in Cincinnati, Ohio, on July 14,  
2008.

STEVEN RAY GREEN AND ASSOCIATES  
NATIONALLY CERTIFIED COURT REPORTERS  
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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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SHARFI, MUTTY, ORAU  
STEWART, DON, MOELLER AND ASSCS.  
ULSH, BRANT, NIOSH

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

(9:30 a.m.)

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22WELCOME AND OPENING COMMENTSDR. LEWIS WADE, DFO

**MS. BEACH:** Good morning, this is Josie Beach from the Mound working group. Thank you for your patience this morning while we got started a little late.

Lew, I'm going to go ahead and turn the microphone over to you to start.

**DR. WADE (by Telephone):** Thank you, Josie.

This is Lew Wade, and I'm acting as the Designated Federal Official for this work group. I would also note for the record that Brant Ulsh, a federal employee, is in the work group meeting room.

Is that correct, Brant?

**DR. ULSH:** Yes, I'm here.

**DR. WADE (by Telephone):** So we have a federal official also in the work group if for any reason I was to lose contact with this call. I would also inquire before we begin, do we have a member of OGC on the line as well?

1 (no response)

2 **DR. WADE (by Telephone):** A member of the  
3 Office of General Counsel?

4 (no response)

5 **DR. WADE (by Telephone):** We don't need a  
6 member of OGC. As a courtesy I was asking if  
7 there was one present. I'll ask again before  
8 we conclude our introductions.

9 Ray, are you up and running?

10 **THE COURT REPORTER:** Yes, sir.

11 **DR. WADE (by Telephone):** Great. This is a  
12 meeting of the Mound work group. This is a  
13 work group on the special exposure cohort as  
14 it relates to the Mound site, and the chair of  
15 that work group is Josie Beach.

16 Josie, you're in the room?

17 **MS. BEACH:** Yes, I am.

18 **DR. WADE (by Telephone):** Phillip Schofield  
19 is a member.

20 Phillip, are you with us?

21 **MR. SCHOFIELD:** Yes, I am.

22 **DR. WADE (by Telephone):** Present in the  
23 room?

24 **MR. SCHOFIELD:** Yes.

25 **DR. WADE (by Telephone):** Robert Presley

1 present in the room?

2 **MR. PRESLEY:** Yes, sir.

3 **DR. WADE (by Telephone):** Brad Clawson  
4 present in the room?

5 **MR. CLAWSON:** Yes.

6 **DR. WADE (by Telephone):** Dr. Ziemer is  
7 listed as an alternate on this work group. Is  
8 Dr. Ziemer involved in the call or present in  
9 the room?

10 **MS. BEACH:** Lew, he did indicate he would  
11 not be available today.

12 **DR. WADE (by Telephone):** Good. Are there  
13 any other Board members who are either in the  
14 room and on the call who have not yet been  
15 identified?

16 (no response)

17 **DR. WADE (by Telephone):** Any other Board  
18 members?

19 **MR. GIBSON (by Telephone):** This is Mike  
20 Gibson, Board member. I am conflicted, and  
21 I'm listening in as a member of the public.

22 **DR. WADE (by Telephone):** Okay, thank you,  
23 Michael.

24 Any other Board members participating  
25 who have not yet identified themselves?

1 (no response)

2 **DR. WADE (by Telephone):** Okay, we do not  
3 have a quorum of the Board, and that's  
4 appropriate for a work group meeting, so we  
5 can begin.

6 Before I do the introductions, let me  
7 do a very brief explanation as to a part of  
8 the confusion for this morning with apologies  
9 to everyone who's been impacted by it. But  
10 the situation at NIOSH is that John Howard,  
11 our very able leader, has completed his six-  
12 year term as of last Friday. Whether or not  
13 John will be reappointed still remains to be  
14 seen. There's much speculation about that,  
15 but starting this morning, Dr. Christine  
16 Branche is acting as the NIOSH Director, and  
17 therefore, Christine could not be on this  
18 call.

19 Chia-Chia Chang from Christine's staff  
20 is en route, but her plane was delayed, and  
21 Chia-Chia should arrive there before too long.  
22 Rather than wait until the originally delayed  
23 time of 10:45, I stepped in to let us start a  
24 bit early because I didn't want to be  
25 disrespectful of the time of the Board

1 members, the work group members who are  
2 already assembled. So with apologies to the  
3 little bit of a hiccup this morning, but  
4 there's no reason we shouldn't be able to  
5 continue smoothly from here.

6 Let me ask for other members of the  
7 NIOSH or ORAU team who are in the room or on  
8 the call to identify themselves.

9 **MR. ELLIOTT (by Telephone):** This is Larry  
10 Elliott, Director of OCAS. I'm not conflicted  
11 at Mound.

12 **DR. WADE (by Telephone):** Hi, Larry.

13 Other NIOSH/OCAS -- excuse me,  
14 OCAS/ORAU team members present.

15 **MR. STEWART:** I'm Don Stewart from Dave  
16 Moeller and Associates. I am not conflicted  
17 at Mound.

18 **MR. CHEW:** I'm Mel Chew from the O-R-A-U  
19 team. I am not conflicted with Mound.

20 **DR. ULSH:** Brant Ulsh from OCAS, no conflict  
21 with Mound.

22 **MS. HOFF:** Jennifer Hoff with the ORAU team,  
23 not conflicted with Mound.

24 **MS. BRACKETT (by Telephone):** Liz Brackett  
25 with the ORAU team. I am conflicted at Mound.

1           **DR. WADE (by Telephone):** Other members of  
2 the extended NIOSH/ORAU family.

3           **MR. SHARFI (by Telephone):** Mutty Sharfi,  
4 ORAU team, conflicted at Mound.

5           **MR. RICH:** Bryce Rich, O-R-A-U team,  
6 conflicted.

7           **MR. POTTER (by Telephone):** Gene Potter,  
8 ORAU team, not conflicted.

9           **DR. WADE (by Telephone):** Welcome, Gene.  
10                           Other members of the NIOSH/ORAU team.

11           **MR. LaBONE (by Telephone):** Good morning,  
12 this is Tom LaBone, ORAU team. I'm  
13 conflicted.

14           **DR. WADE (by Telephone):** Anyone else,  
15 NIOSH/ORAU team?

16                           (no response)

17           **DR. WADE (by Telephone):** How about SC&A?

18           **MR. FITZGERALD (by Telephone):** This is Joe  
19 Fitzgerald. I'm not conflicted.

20           **DR. MAURO (by Telephone):** John Mauro, not  
21 conflicted.

22           **MS. DeMERS:** This is Kathy Robertson-DeMers,  
23 and I'm conflicted.

24           **MR. ALVAREZ (by Telephone):** Bob Alvarez,  
25 not conflicted.



1                   **MS. GILLIAMS (by Telephone):** Good morning,  
2 this is Cozell Gilliams standing in for Zaida  
3 Burgos. I wanted to make sure that certain  
4 participants were in attendance, and they are.  
5 I am disconnecting at this point.

6                   **DR. WADE (by Telephone):** Thank you.

7                                   Other federal employees?

8                                   (no response)

9                   **DR. WADE (by Telephone):** How about members  
10 of Congress or their representatives?

11                                   (no response)

12                   **DR. WADE (by Telephone):** What about  
13 workers, petitioners, their representatives?

14                                   (no response)

15                   **DR. WADE (by Telephone):** Anyone else who  
16 would like to be identified associated with  
17 the Mound site?

18                                   (no response)

19                   **DR. WADE (by Telephone):** Anyone else at all  
20 who would like to be identified for the record  
21 as being on this call?

22                                   (no response)

23                   **DR. WADE (by Telephone):** The last chance to  
24 get your name in the record.

25                                   (no response)

1                   **DR. WADE (by Telephone):** Okay, Josie, it's  
2 all yours.

3                   **WELCOME, ADMINISTRATIVE COMMENTS, AGENDA ADDITIONS OR**  
4                   **REVISIONS**

5                   **MS. BEACH:** All right, Lew. Once again I  
6 want to thank you for stepping in and allowing  
7 us to start our meeting a bit earlier than  
8 what was anticipated.

9                   **DR. WADE (by Telephone):** My pleasure. It's  
10 like old times.

11                   **MS. BEACH:** Yes, it is, and I appreciate it.

12                                 First of all I want to direct your  
13 attention to the agenda. It is posted on the  
14 website. For those of you that don't have it  
15 in front of you, you can look there. The only  
16 thing that's changing with the agenda unless I  
17 hear from somebody else is everything is one-  
18 half hour later than what was posted on the  
19 original agenda. So any changes that anybody  
20 -- we'll get you one.

21                   **EXTERNAL DOSE FOR INTEGRITY/COMPLETENESS,**  
22                   **MATRIX #14-19**

23                                 At this point then we will start with  
24 "External dose for integrity and completeness,  
25 Matrix number 14 through 19." And I believe  
we're going to start with SC&A.

1                   **MR. FITZGERALD (by Telephone):** Yes, thank  
2 you.

3                   This is Joe Fitzgerald. Ron Buchanan  
4 is only available for the morning, so we  
5 thought we would go ahead and discuss this in  
6 this particular session. And before turning  
7 to Ron, I think our issue -- and this is not  
8 just 14, but a number of these issues that  
9 deal with the neutron dose estimations -- go  
10 to the same question which is the ability to  
11 rely on NTA film information given the energy  
12 dependence of NTA film. This is not a new  
13 issue. In fact, this is a pretty generic  
14 question that's been raised at other sites.

15                   What concerns us is that the kind of  
16 measurements that would give some sense of  
17 what the spectrum is suggests that there's  
18 certainly a number of neutron sources below  
19 the threshold for the NTA film that may be  
20 missed. And the question is can one still  
21 come up with a dose estimation? So starting  
22 with 14 I think we want to hone in on that  
23 particular point and get maybe some response  
24 from NIOSH and the ORAU team that would  
25 clarify that.

1 Ron, do you want to -- I think we can  
2 summarize what we believe we read in the NIOSH  
3 response, and certainly, Brant, NIOSH can  
4 correct us if we get the interpretation wrong  
5 from this last set of responses. And then we  
6 can give you our take at this point.

7 **MR. BUCHANAN (by Telephone):** This is Ron  
8 Buchanan of SC&A. And the issue 14 and 15 are  
9 separated in the matrix because of the  
10 response in the evaluation report by NIOSH,  
11 but they are very closely tied.

12 And I want to start off briefly by  
13 explaining the problem so that we can see what  
14 is needed to solve the problem and the reason  
15 that SC&A thinks perhaps that it could be an  
16 accuracy problem in assigning neutron dose at  
17 Mound. And so just briefly, 14 and 15 refer  
18 to the neutron energy spectrum at Mound. And  
19 in the earlier days they used polonium sources  
20 which had a fairly high energy, four-and-a-  
21 half meV or so.

22 And then they started working with  
23 plutonium sources in the '60s which was more  
24 like a 1.3 meV. And what we would like to  
25 know is how NIOSH would propose reconstructing

1 the dose because of the following problems:  
2 As most of you know, NTA film decreases its  
3 response very rapidly when you get down around  
4 a half, 0.7 meV, and so neutrons below that  
5 energy aren't registered. And the ones around  
6 that energy and above it fade with time  
7 depending on when the film is read after the  
8 exposure occurs.

9 And so initially the polonium sources  
10 put out a fairly high energy neutron, four-  
11 and-a-half meV. It gets degraded and in the  
12 evaluation report, it was stated initially  
13 that there was the high energy neutrons, and  
14 then later on in the report it stated that  
15 there was degraded neutrons. And so this  
16 would cause a problem in the calibration.

17 Originally, it was calibrated with  
18 polonium source and that would create a  
19 problem in that in the work environment, the  
20 neutrons are rapidly degraded. And so the  
21 person wearing the badge would receive dose  
22 which wouldn't be registered on the NTA film.

23 And then later on it was switched to a  
24 plutonium calibration source which has that  
25 1.3 meV energy, and additionally, the same

1                    thing would happen. The worker in the field  
2                    would be exposed to neutrons below the 0.7 or  
3                    0.5 meV threshold, and it wouldn't be  
4                    registered.

5                    Now the problem is you really don't  
6                    know what the spectrum is out there in the  
7                    work area as a function of location process  
8                    and changes over time. And so you have to  
9                    have some sort of absolute neutron measurement  
10                   out there to compare your NTA film to before  
11                   you can do a direct dose assignment.

12                   And so now if you read through TBD-6,  
13                   they make several statements about adjustment  
14                   to the dose, Meyers and such in his  
15                   recollection and his documentation state some  
16                   of that was done. And I want to briefly cover  
17                   that that let's you know what was done and  
18                   what wasn't done.

19                   I cannot find that there was any  
20                   absolute NTA measurements done simultaneously  
21                   with a neutron method such as rim balls and/or  
22                   tissue equivalent proportional counter to say,  
23                   okay, tintrac\* is equal to a certain ^ dose  
24                   out in the workplace. Now NIOSH has said that  
25                   there is some --

1                   **MS. BEACH:** Ron, Ron --

2                   **MR. BUCHANAN (by Telephone):** -- new data  
3 that they're looking at, but I have not seen  
4 that data.

5                   **MS. BEACH:** Ron, could I stop you for just a  
6 moment. I'm going to take a page out of  
7 Christine's book and ask those of you that are  
8 on the phone and are not speaking to please  
9 mute your phone. We can hear sneezing, and it  
10 is very disruptive. Thank you.

11                                   Sorry, Ron.

12                   **MR. BUCHANAN (by Telephone):** And so what we  
13 want to do is to, what we need to do is to see  
14 if there's any absolute neutron measurements  
15 to compare the NTA film to. Now, in the  
16 Meyers documents he does talk about the fact  
17 that they found the polonium source and the  
18 plutonium source gave about a factor of 2.3  
19 difference in calibration so they made some  
20 adjustment or should make some adjustment at  
21 that period.

22                                   And then in 1970 to '76 they found  
23 that fading was a problem, and they adjusted  
24 the dose by a factor of two. Now, I cannot  
25 really find in the, looking at the MESH

1 database and the old handwritten records I  
2 could find in documentation, I cannot see that  
3 that was done directly. Now, there might be  
4 evidence that was done. I could not really  
5 see it except in the MESH database they have  
6 neutron dose, and then they have another file  
7 called Double Neutron Dose.

8 And that affects only 1970 to '76 is  
9 fading. And so that information is there.  
10 And the dose reconstructions I've looked at do  
11 use the double neutron dose during '70 to '76  
12 to correct for fading during that period.

13 **MR. STEWART:** Ron? Does or does not use the  
14 double dose?

15 **MR. BUCHANAN (by Telephone):** They do use  
16 the neutron double dose in the few claims I  
17 looked at.

18 So where SC&A is at at this point,  
19 like I say, the neutron spectrum measurements  
20 that we could find in the documents, I found  
21 four or five from 1963 to 2001. And the  
22 spectrum measurements, there wasn't much  
23 detail on how it was done. One of them was  
24 done with two rem balls that I did find which  
25 doesn't give you a very fine tuning. And the

1 average energy range ran from 0.5 to 1.2 meV  
2 with the average about 0.3 -- excuse me, 0.8  
3 meV.

4 And I'd like to point out that if you  
5 have an average energy of around say 0.8 meV  
6 or 1 meV, and you're calibrating with 1.3 meV  
7 neutron source, you're going to register low  
8 because that's going to skew your whole  
9 spectrum down. More of it's going to fall  
10 below the threshold of the NTA film. It's  
11 going to miss it.

12 And unfortunately, if the average  
13 energy was 1.3 or above, you would be on or  
14 slightly claimant favorable. When you start  
15 scooting down to 0.8, 0.9, 1 meV, a lot of  
16 that tail's going to fall below the threshold,  
17 and you're going to have a low dose registered  
18 on your NTA film. And so that's the point  
19 that we're at now is that we have not seen the  
20 neutron energy spectrum that they have talked  
21 about other than the few I could find which  
22 were fairly low energy.

23 And then also if you're not going to  
24 use the NTA film results, the other option is  
25 using the neutron over photon value that you

1 assign a certain N-over-P value, multiply your  
2 photon dose by that and assign neutron dose.  
3 And that's been done at some of the sites.

4 However, of course, the TBD did not  
5 address that in any detail, and I understand  
6 that NIOSH has some N-over-P values that have  
7 come up since December or so. And we have not  
8 seen them. We don't know how they were  
9 measured or where or when, but you would need  
10 measurements done by something other than NTA  
11 film because you can't correct NTA film with  
12 NTA film.

13 And then you would need it as a  
14 function of location and time because the  
15 workers at different locations, different  
16 times and exposed to different neutron  
17 spectrums employing different neutron-to-  
18 photon ratios to do that. So that's where  
19 SC&A is at right now. And so I guess at this  
20 point we could open it up for discussion.

21 **DR. ULSH:** This is Brant Ulsh from NIOSH.  
22 Thanks for that summary, Ron. We understand  
23 the issue with, I think you mentioned two  
24 issues. One is the neutron energy spectrum,  
25 and the second one that you briefly touched on

1 was fading.

2 Not only are we aware of it, but the  
3 Mound health physics staff appear to be aware  
4 of it, too. If you look at the document, I  
5 think it's called "History of Neutron  
6 Monitoring at Mound" or something close to  
7 that. I don't have it right in front of me.  
8 They explicitly talk about at least the fading  
9 issue. I'm pretty sure they talk about the  
10 neutron spectrum issue.

11 In addition, I've got Don Stewart in  
12 the room, and he's going to talk a little bit,  
13 in a little bit more detail after I'm done.  
14 But as you noted, in terms of the energy  
15 spectrum they started using plutonium in the,  
16 I think the '60s, maybe the late '50s, but  
17 they really got hot and heavy into it in the  
18 '60s. And that does have a lower, unmoderated  
19 energy than the polonium.

20 But we explicitly talked about in the  
21 evaluation report that we are well aware of  
22 the degraded neutron energy spectrum. The way  
23 that it's been done at other sites, for  
24 instance, at Y-12, is you simply apply a  
25 correction factor to account for the fraction

1 of the neutrons that are below the NTA  
2 threshold.

3 You're correct if they used an  
4 unmoderated source to calibrate that you might  
5 be underestimating the neutron dose the  
6 workers would experience in the field. But I  
7 know at least at, well, the sites that I know  
8 of, I'm thinking specifically of Rocky Flats.  
9 They didn't just use a bare, unmoderated  
10 source. They used varying degrees of  
11 moderation in their calibrations. Now, I  
12 don't know if they did that at Mound off the  
13 top of my head. We'd have to check on that.  
14 But it would be surprising if they didn't.

15 Also, there's an extensive set of  
16 neutron energy spectrum measurements. I'm  
17 looking at Don for confirmation. Yes, yes,  
18 there are. And perhaps Don can give you some  
19 more details on that. So the kinds of things  
20 that you indicated you would like to see in  
21 terms of neutron energy spectrum measurements,  
22 they do exist, and we do have them.

23 You are correct that we are also,  
24 well, we plan to rely on NTA film, not  
25 primarily on an n/p ratio, although we are

1                   pursuing an n/p ratio as well. We have paired  
2                   neutron and photon measurements for different  
3                   gloveboxes in the different lines, and the SM  
4                   and PP Buildings, a few I think in Building  
5                   50.

6                   And Don can give you some more details  
7                   there, but that's strictly as a backup. The  
8                   primary line of estimating neutron dose is  
9                   going to be the NTA film. I know that we've  
10                  done similarly to the way it's been done at  
11                  other sites.

12                 Don, do you want to give some more  
13                 details?

14                 **MS. BEACH:** Before you start, Don, Brant,  
15                 you mentioned a paper "The History of --

16                 **DR. ULSH:** Yes, it's --

17                 **MS. BEACH:** What's the name of that again?

18                 **DR. ULSH:** It's referenced in the evaluation  
19                 report. I think it's called "History of  
20                 Neutron Monitoring at Mound" or something like  
21                 that.

22                 **MR. STEWART:** It's in the site records  
23                 database.

24                 **DR. ULSH:** I'll tell you what, while Don's  
25                 talking I'll try to find it.

1                   **MS. BEACH:** Thank you.

2                   **MR. STEWART:** Just starting with the fading  
3 issue, Mound was aware of this issue, and they  
4 began in 1968 to apply a protocol when they  
5 developed the NTA films to correct for track  
6 fading depending on how, on the film's last  
7 exposure and the date of processing. So we  
8 may have a gap there. We'll need to go back  
9 and apply similar corrections to data related  
10 to plutonium prior to that date. I believe it  
11 was the middle of 1968. So track fading was  
12 addressed by the Mound people.

13                                 We are preparing a document that  
14 discusses a number of neutron/photon ratios  
15 based on periodic measurements made through a  
16 fairly long, significant portion of the  
17 history of the SM and PP Buildings. We will  
18 use that n/p ratio primarily to assign missed  
19 dose rather than to apply unmonitored dose  
20 because our position is that most workers or  
21 all workers at Mound were monitored for the  
22 areas that they worked in. We don't see a lot  
23 of personnel who claim exposure who do not  
24 have dosimetry records. And I believe SC&A  
25 has found that to be the case as well.

1           **DR. ULSH:** Well, I would also note, Ron --  
2           this is Brant Ulsh again -- as you mentioned,  
3           when you look in the dose reconstructions for  
4           1970 to '76, we did use the double the neutron  
5           dose, and that's noted on your spreadsheet on  
6           the Findings tab, column B-27. One hundred  
7           percent of the MESH neutron dose values for  
8           '70 to '76 were correctly entered as two times  
9           the original. I believe that the reason for  
10          that --

11                         Was that fading, Don, or was that  
12          spectral issues?

13          **MR. STEWART:** I believe that primarily  
14          spectral issues at that time. And it, the way  
15          the memos read, they had recorded those doses  
16          and committed to double those doses when the  
17          records were transposed or moved to another  
18          database, and that happened and they were  
19          entered in the MESH as I understand it. Mutty  
20          can correct me if I'm wrong there.

21          **MR. BUCHANAN (by Telephone):** This is Ron  
22          Buchanan. Yes, apparently, the MESH database,  
23          they entered the original neutron dose and  
24          then they doubled. They had a separate file  
25          with double neutron doses. And according to

1 the TBD-6, this was due to fading. Now,  
2 whether that's correct or not, I don't know,  
3 but TBD-6 does say that that was due to fading  
4 as opposed to ratio.

5 **DR. ULSH:** And I think that was mainly in  
6 the PP Building because they had additional  
7 shielding in PP Building that would knock down  
8 the neutron energy spectrum. Before they  
9 moved into PP Building, they had much less  
10 shielding in the SM Building.

11 And in addition, they were working  
12 with, as you mentioned, polonium in the early  
13 days, so you had a much higher energy,  
14 starting energy so the fading issue was less.  
15 But they did also work with Plutonium-238.

16 The only time you would have a fading  
17 issue though is if the calibration films are  
18 treated differently than the films that are  
19 worn in the field. If you examine that, the  
20 calibration films over time, the time period  
21 that you would exchange and read the ones on  
22 the film, it's all going to come out in the  
23 wash. And we have every indication that  
24 that's exactly what they did at Mound.

25 So you're right that there is a

1 fraction, there is going to be some fading,  
2 but that's accounted for in the way they  
3 handled calibration films. You're also  
4 correct that there's a fraction of the neutron  
5 energy spectrum that is below the NTA  
6 detection limit, but again, that was accounted  
7 for with spectral measurements which I  
8 understand you guys haven't seen those. We  
9 will provide those to you.

10 **MR. BUCHANAN (by Telephone):** Okay, now, on  
11 the track fading, I would like to emphasize  
12 that before 1968 there does not appear to be  
13 any correction for track fading. From the  
14 start of NTA film about 1950, they did do a  
15 measurement in '51, but nothing became of it.  
16 As far as I can find, July of 1968 they  
17 started doing the one week-, two week-, four  
18 week-type thing. And then in 1970 to '76 they  
19 did a two times correction factor. So we  
20 still have the '50 to '68 timeframe where  
21 fading is still unaddressed.

22 Now, I realize this wouldn't be as big  
23 a problem with your polonium sources as it was  
24 with your plutonium sources; however, that  
25 fading was not addressed during that period of

1 time in any document I can find. And so that  
2 would be a large issue during the earlier  
3 times. I don't know, it depends on the energy  
4 spectrum in the work area.

5 **MR. STEWART:** Plutonium began to enter into  
6 the source term in the late '50s in small  
7 amounts, usually weapons-grade-related stuff.  
8 Later in the early '60s it began to be a  
9 production issue with the PU-238 sources. So  
10 there is a gap there. At some point they did  
11 not account for fading, and that is an issue  
12 that is currently under review for the  
13 revision of this TBD.

14 **DR. ULSH:** But again, I think I would  
15 propose that this is more of a TBD issue.  
16 It's a matter of what you multiply the neutron  
17 dose by. Is it two? Is it zero, or not zero.  
18 Is it one because they've already accounted  
19 for it? Is it two because they haven't? I  
20 don't see, it can't be infinite. I don't  
21 think it's an SEC issue. I think it's a TBD  
22 issue. That doesn't mean it's not important,  
23 but I would put it in the TBD issue.

24 **MR. BUCHANAN (by Telephone):** I would agree  
25 if the amount of neutron below the threshold

1 can be accounted for by some other absolute  
2 neutron measurement or can be shown to be  
3 fairly insignificant. At this point I think  
4 that's where the SEC issue comes in is that we  
5 don't know at this time that it can be  
6 accurately, with sufficient accuracy, assign  
7 the neutron dose in the NTA film until we see  
8 how that would be done.

9 **MR. FITZGERALD (by Telephone):** And, Ron,  
10 this is Joe. It sounds like if one could see  
11 the spectral measurements, which is what Brant  
12 is suggesting, and see how the correction  
13 factors are derived from those that would, I  
14 guess, go a long way to answering your  
15 question.

16 **MR. BUCHANAN (by Telephone):** Yes, at this  
17 point I cannot rule it out as an SEC issue,  
18 and I can't say it is an SEC issue. I think  
19 it's something that remains open until we can  
20 look at this further data that we haven't  
21 seen.

22 **DR. ULSH:** Okay, I have down -- Josie, with  
23 your agreement -- I have down as an action  
24 item that we will provide the spectral  
25 measurement to the working group and to SC&A,

1 spectral measurement data. But again, you  
2 said yourself, Ron, earlier that, I think you  
3 said that the average energy was 0.8 which  
4 would mean that there is a fraction of the  
5 spectrum that is well above the NTA detection  
6 limits.

7 So again it's just a question of  
8 picking the right number. I mean, even if  
9 it's one percent that's above the NTA film you  
10 can estimate. You just multiply by the  
11 appropriate factor. I understand that  
12 agreeing to what that number is depends on  
13 providing the spectral measurement, but it  
14 seems very obvious to me that this is not an  
15 SEC issue. That's my position.

16 **MR. BUCHANAN (by Telephone):** Okay, well, I  
17 don't know what the official definition of SEC  
18 issue is, but until it has been shown that it  
19 can be corrected for, and will be corrected  
20 for, then the accuracy would not be  
21 appropriate at this point. And so I guess  
22 it's up to the working group to decide when  
23 that cutoff is. But as far as I see it now is  
24 that we cannot sign off and say, okay, it can  
25 be produced with sufficient accuracy until we

1 see that it can be, that it's been  
2 demonstrated that it can be.

3 **MS. BEACH:** And then we also heard from Don.  
4 You had a paper on neutron/photon fading you  
5 were going to, you were still working on.

6 **DR. ULSH:** That's in the neutron history  
7 document I showed you, and I have that as an  
8 action item to provide that to you as well.

9 **MS. BEACH:** So those two action items have  
10 come out of this. Did I miss any others?

11 **MR. BUCHANAN (by Telephone):** Yes, we  
12 haven't seen the details on the neutron/photon  
13 values. We talked about spectral measurements  
14 and then neutron/photon values. So we need to  
15 look at those, how they was determined, where,  
16 when and the details on that.

17 **MS. BEACH:** Okay.

18 **MR. STEWART:** That paper's currently under  
19 review.

20 **DR. ULSH:** And we'll have that as an action  
21 item and provide that as well.

22 **MS. BEACH:** Okay. Is there any other items,  
23 work group members? Questions?

24 (no response)

25 **MS. BEACH:** Ron, are you prepared to go on

1 to 16?

2 **MR. BUCHANAN (by Telephone):** Yes. Item 16  
3 was the shallow dose, and this again is kind  
4 of a thing that we couldn't prove one way or  
5 the other. Beta dose mainly and low energy  
6 photon dose make up the shallow dose.

7 And Mound originally had a lot of beta  
8 dose when they were using the irradiated  
9 slugs, and there's some documentation in the  
10 early days about that. And then they did some  
11 rearranging, engineering measures to get the  
12 worker away from that. And so then it kind of  
13 went off the radar screen in the TBDs until  
14 the '70s.

15 And the way I understand it is that  
16 the person reading the film badge, you have an  
17 open window which would record all the doses,  
18 and a shielded window which would record the  
19 deep dose. And if the dosimetrist seen a  
20 blackened area under the open window, it means  
21 that there was probably some shallow dose. So  
22 he would record that density and then record  
23 the shielded dose as normal, and they used, I  
24 believe, a radium calibration to determine the  
25 density reading and then convert that to a

1 deep dose to the worker.

2 Now there appears to be two areas here  
3 of concern that we have is that, one, I could  
4 not find any recording of shallow dose. Now I  
5 didn't, I only went through a few records, but  
6 I couldn't find in early days any recording of  
7 shallow dose. And, secondly, and there does  
8 appear to be some shallow dose recorded in the  
9 later years, '70s and '80s, and so there's a  
10 gap there.

11 There's kind of a black hole there in  
12 the '50s and '60s and some in the '70s of  
13 shallow dose recording. And then there was no  
14 calibration, beta calibration, until '79 or  
15 later, and then there was some difficulty in  
16 meeting some of the DOELAP programs or  
17 whatever was prevalent at that time. And it  
18 was into the '80s before you could really say  
19 you had a beta calibration so that you could  
20 assign a shallow dose.

21 But that's my understanding of the  
22 records and so those are the two things I  
23 wanted to point out was that shallow dose does  
24 not seem to be brought to the forefront much  
25 in the TBD.

1                   **MS. BEACH:** Thank you.

2                   If you are not speaking, please mute  
3 your phone. We can hear your conversations on  
4 the line. Thank you. Also, if you don't have  
5 a mute button, star six will work. Thank you.

6                   Sorry, Ron.

7                   **MR. BUCHANAN (by Telephone):** That's okay.  
8 So beta dose, we cannot really find out if it  
9 was a problem especially when they were using  
10 the polonium and before they brought plutonium  
11 in and had a lot of these lower energy  
12 photons. However, we want to point out that  
13 there seems to be two areas there of concern  
14 is the large gap in any recording of shallow  
15 dose in '50s, '60s and up into the '70s.

16                   And even if you had it recorded, how  
17 would you assign shallow dose because of the  
18 lack of calibration. And SC&A has questioned,  
19 we need to ask the working group is this an  
20 SEC issue that needs to be presented here or  
21 is this a TBD, a site profile issue.

22                   **DR. ULSH:** I think we'll follow the same  
23 format here. I'll speak in general terms and  
24 let Don fill in the details.

25                   First of all I would just like to

1 point out to the working group for your  
2 consideration, shallow dose is mainly an issue  
3 for skin cancers, not exclusively, there's a  
4 few more, breast cancer, testicular cancer, I  
5 think, eye, so there's a few. But the most  
6 common by far where shallow dose would be an  
7 issue is skin cancer. Skin cancer is not an  
8 SEC cancer at this point.

9 So I think we're all trying to do the  
10 claimant favorable thing. This doesn't, of  
11 course, impact on whether or not we can  
12 accurately reconstruct shallow dose, but I  
13 would just ask you to keep that in the back of  
14 your mind as we talk about this in terms of  
15 whether or not it should be the basis of an  
16 SEC issue. If an SEC was granted based on  
17 that, it would disadvantage the people with  
18 skin cancer because they wouldn't, we would be  
19 saying that we can't reconstruct the doses for  
20 the skin cancers, and that's where the shallow  
21 dose is an issue.

22 Now in terms of whether or not it  
23 really was an issue at all at Mound, one of  
24 the main reasons they designed the T Building  
25 as they did was because of exactly this issue,

1 shallow dose. And that's why they made many  
2 parts of the processes where this was a  
3 problem, a remote process. I mean, that was  
4 explicitly done on purpose for that reason.

5 Now, in terms of the history of  
6 shallow dose and when it was an issue, I'll  
7 turn it over to Don and let you fill in the  
8 blanks, Don.

9 **MR. STEWART:** Certainly, at the start of  
10 processing at the Dayton Laboratory they had  
11 some very high shallow dose measurements on  
12 their film dosimeters. And, in fact, they  
13 would, one of the problems was they would  
14 quickly reach their allowable dose, tolerance  
15 dose, at that time. So implicit in the design  
16 of the T Building was control of these shallow  
17 doses among other things.

18 And so the first two steps of the  
19 process, the slug removal and the initial  
20 concentration step were done in concentration  
21 cells which were operated by personnel outside  
22 the room using long-handled valves and things  
23 of that nature under some very thick, I  
24 believe it was steel shielding to shield them  
25 from this shallow dose.

1                   It's clear that on this basis the  
2 Mound program at least felt that they, quote,  
3 had no beta dose. Whether that's something  
4 that we need to accept as gospel or we need to  
5 go back and look at their methods for measure  
6 of dose and come to a conclusion that they  
7 were reliable. Certainly, there is a gap  
8 there when they didn't have a beta calibration  
9 prior to 1978.

10                  And we are reviewing that to see if a  
11 correction factor is appropriate for years  
12 prior to that. Once again, we have a reliably  
13 measured photon dose with our film and TLD  
14 dosimeters. From that we can infer an  
15 accurate or overestimating beta dose when  
16 necessary.

17                 **MS. BEACH:** I have a question. Can you guys  
18 give me just a brief summary of what is, how  
19 do you define shallow dose? I know each site  
20 looks at it a little bit differently, and I'm  
21 curious as to how Mound is defining shallow  
22 dose.

23                 **DR. ULSH:** I can give you the overview. I  
24 can't give you the exact formula because those  
25 vary. At Mound the way that you're going to

1 get shallow -- well, first of all, shallow  
2 dose is penetrating plus non-penetrating  
3 radiation. So it's going to include the deep  
4 dose, but on top of that you're going to have  
5 dose from things like, well, beta, if it  
6 exists, or more importantly at Mound, low  
7 energy photon dose. It doesn't penetrate but  
8 a couple of millimeters into the skin. So  
9 it's going to be both of those components  
10 added together. Does that answer your  
11 question?

12 **MR. CLAWSON:** It does, but you know it's  
13 interesting because each one of these sites  
14 it's all kind of different. I guess from my  
15 kind of point on that was do we kind of know  
16 how Mound set it up? Because all we've kind  
17 of seen is at different sites, they've all got  
18 kind of a different little process that they,  
19 and terminology for shallow and deep dose. I  
20 just want to make sure that we have  
21 documentation at Mound how they interpreted  
22 this because we're getting different  
23 interpretations at different sites.

24 **DR. ULSH:** I think the reason you're getting  
25 different interpretations at different sites,

1 Brad, is because different sites have  
2 different kinds of radiation. For instance,  
3 you may not have a low energy photon component  
4 if you're not dealing with plutonium. So at a  
5 uranium site that wouldn't be an issue,  
6 whereas beta would be.

7 **MR. CLAWSON:** And I understand this. I just  
8 want to make sure that we're all on the same  
9 track for Mound, their terminology and how  
10 they're implementing--

11 **DR. ULSH:** I think that is in Meyer's  
12 history of dosimetry at Mound.

13 Am I correct, Don?

14 **MR. STEWART:** Oh, I'm not sure of the exact  
15 documents. There are a number of places where  
16 they specify the filtration for their open  
17 window, and that for the density of their  
18 filters for the shielded portion of the  
19 dosimeters. And that really is the physical  
20 constraint as to what we consider a shallow  
21 dose. I don't recall the exact factors  
22 offhand, but I think they used what I would  
23 call a standard filtration for their  
24 dosimeters.

25 **MR. CLAWSON:** In Meyer's, Volume One, page

1 nine, shallow doses were not routinely  
2 reported until the '69 era. Is that fairly  
3 accurate? According to Meyers that's --

4 **MR. STEWART:** Yeah.

5 **DR. ULSH:** And again, I think that is  
6 because the places where you would be  
7 expecting to get a lot of shallow dose were  
8 remote operations. I mean, that's why they  
9 did them.

10 **MR. STEWART:** And once again about that time  
11 period they were surprised to find that they  
12 had some darkening in the open window portion.  
13 So that's when they started to look at that.

14 **MR. CLAWSON:** That was in the '77 to '79  
15 timeframe?

16 **MR. STEWART:** A memorandum I think was  
17 issued in 1962.

18 **MS. BEACH:** Also, on page 45 the last  
19 paragraph it says what you said earlier about  
20 keeping in mind the shallow dose. Of 50  
21 claims with completed determinations and  
22 employment prior to '79, 21 have been  
23 determined to be compensable. Could we have a  
24 listing of those 50 cases? I'd like SC&A to  
25 take a look at those. Is that a possibility

1 to get that?

2 DR. ULSH: Yeah, yeah. We'll put that as an  
3 action item.

4 MS. BEACH: Thank you.

5 MR. STEWART: Good. Those numbers may have  
6 changed subsequently. I believe I did that  
7 about a year ago or so.

8 MS. BEACH: So there wouldn't be less than  
9 50?

10 MR. STEWART: No.

11 MS. BEACH: It may be more.

12 MR. STEWART: Correct.

13 DR. ULSH: And if it was a year ago that  
14 would have included -- sorry, that would not  
15 have reflected the SECs from '49 to '59.

16 MR. STEWART: Correct.

17 DR. ULSH: So those numbers will be  
18 different, but we'll provide you with those  
19 cases. So I think, if I understand what  
20 you're asking for, the completed claims --  
21 whatever the number is. It won't be 50 any  
22 more -- with employment prior to '79 that  
23 would have cancers of skin, testes, breast,  
24 lip and eye.

25 MS. BEACH: Right.

1           **MR. STEWART:** Probably actually want to look  
2 at skin cancers in this particular . . .

3           **MS. BEACH:** Yeah.

4           **DR. ULSH:** Well, we can pull you out the  
5 Mound cases that have those cancers.

6           **MS. BEACH:** Okay, well, basically it said of  
7 the 50. I just kind of wanted to get an  
8 overview idea of what those looked like.

9           **DR. ULSH:** Okay, you've got that as an  
10 action item.

11          **MS. BEACH:** Thank you.

12                   Any other questions, SC&A or Ron, any  
13 other questions on this 16?

14          **MR. BUCHANAN (by Telephone):** No, we did not  
15 have -- this is Ron Buchanan. We did not have  
16 any definite points here other than to point  
17 out the gap and the calibration problem.

18          **MS. BEACH:** Okay, and just the one action  
19 item or was there an earlier action item?  
20 Just the one I asked for?

21          **MR. BUCHANAN (by Telephone):** Yes, that's  
22 all I know of other than -- is it something  
23 that should remain on the matrix. The working  
24 group will have to decide that.

25          **MS. BEACH:** Okay, thank you.

1                   And are we ready to move on to 17?

2                   **MR. BUCHANAN (by Telephone):** Okay, this is  
3                   Ron Buchanan again and number 17 is the  
4                   monitored workers were the most highly  
5                   exposed. This is something that we actually,  
6                   we get into on every site generally, how do  
7                   you know the most highly exposed workers were  
8                   monitored.

9                   Again, that's kind of a placeholder.  
10                  We came to the conclusion after looking at the  
11                  documents that we did not find documentation  
12                  one way or the other that there was no -- we  
13                  could not find a documented, continuous  
14                  printed document from the operators at Mound,  
15                  the companies operating Mound said to lay out  
16                  who would be badged and who would not be  
17                  badged.

18                  Apparently, it was changed through the  
19                  history of the operation of ^, and so we could  
20                  not document it who was to be badged and not  
21                  be badged other than the highest exposed  
22                  workers who were badged. On the other hand  
23                  when we get into looking at individual claims,  
24                  which we talk about in the next issue, the 22  
25                  claims -- went through about 30 really, we did

1 not find an indication that highly exposed  
2 workers were not badged for a long period of  
3 time.

4 For example, someone that wasn't an  
5 operator or something did not show in out of  
6 20 years of unbadging or something.  
7 Additionally, secretaries were not badged,  
8 which one would expect, if the most highly  
9 exposed was badged. So at this point SC&A  
10 cannot find documentation showing who was  
11 badged. NIOSH said last time maybe they had  
12 some documents that showed the policy. We  
13 have not received anything on that yet, but we  
14 couldn't find anything a really smoking gun  
15 saying that they weren't badged. So that is  
16 where we're at on number 17.

17 **MS. BEACH:** NIOSH, do you have anything?

18 **DR. ULSH:** Yeah.

19 With regard, you know, you're right,  
20 Ron, this does come up it seems at every site.  
21 And I have to admit that I find that a little  
22 bit frustrating, the idea that we would assume  
23 that a site would not monitor the highest  
24 exposed people. We have not found that  
25 anywhere, that that was at least the goal of

1 the program. I mean, it would be the health  
2 physics equivalent of medical malpractice.

3 If you monitored anyone other than who  
4 you believed to be a highest exposed. Now, of  
5 course, there are situations, you know, these  
6 are human beings. There are situations that  
7 might have gone unrecognized inadvertently.  
8 That is a possibility. We don't have evidence  
9 of that at Mound. But I guess I would say I  
10 would have to see evidence that they had done  
11 this for some reason that I just can't figure  
12 out.

13 But in terms of cohort badging, well,  
14 it's understandable that you wouldn't see  
15 documentation talking about cohort badging if  
16 they never did it. I mean, why talk about it  
17 if you don't do it. We don't have any  
18 indication that Mound ever did cohort badging,  
19 and Mound's dosimetry history is very well  
20 documented by Meyer, all nine volumes of it or  
21 eight. There's no mention of cohort badging.

22 And again, for those of you who may  
23 not know, the idea of cohort badging is that  
24 not every individual is monitored but rather  
25 one or more, you know, some fraction of a

1 group of people would be monitored, and that  
2 would be taken as representative of the group.

3 And our position on that, number one,  
4 it didn't happen at Mound, but even if it had,  
5 the only way cohort badging would be  
6 unacceptable would be if it was biased low.  
7 If it was biased high, that's not a problem  
8 for us. If it was even random and  
9 representative, that's also not a problem for  
10 us. It would only be if it was biased low.

11 I just don't see that this is an  
12 issue. There's just no evidence that it  
13 happened at Mound.

14 **MR. FITZGERALD (by Telephone):** Well, Brant,  
15 this is Joe. I think this originated again  
16 from a statement made in the ER that made that  
17 very same assertion. And I think what we are  
18 looking for is a basis for the statement that  
19 was made in the ER. Because it does clearly  
20 say that again that the highest exposed were  
21 badged, and I haven't found any evidence to  
22 the contrary.

23 But I think the reason this issue  
24 originated was just simply to find what the  
25 basis behind that statement happens to be. I

1 think you have articulated it, but again, it's  
2 really the converse of proving that there's  
3 any evidence. And we have not found any. So  
4 I think we're at the point where unless we do,  
5 in fact, find some obvious evidence or  
6 information to the contrary, we're going to be  
7 satisfied.

8 But I think we want to at least look  
9 in terms of the documents retrievable. If  
10 there's anything comes out of that, then we  
11 would certainly bring it back to the work  
12 group. But at this point we have not found  
13 anything to the contrary.

14 But on the other hand I think the  
15 statement in the ER didn't give us any of that  
16 understanding other than to accept the fact  
17 that good health physics practice would have  
18 been exercised by the people managing the  
19 program in those days, which I think we would  
20 have some difficulty accepting at face value.  
21 So that's kind of where we're at.

22 **DR. ULSH:** Okay, well, on page 47 of our  
23 NIOSH responses to the Mound matrix items, we  
24 give you exactly what you're looking for, Joe.  
25 The quote from Meyer's document, Meyer, 1994,

1 and that quote is, "In general, all personnel  
2 who enter a radiation risk area are monitored  
3 for possible exposure to external penetrating  
4 radiation. Personnel who work routinely in  
5 risk areas are monitored for whole body  
6 radiation by film badges which are evaluated  
7 biweekly. Occasional visitors to the risk  
8 areas are monitored by the use of film badges  
9 which are evaluated the day following usage."  
10 So it's not just an absence of evidence. We  
11 have evidence to the contrary that anyone who  
12 went in was monitored. I don't know what else  
13 we could provide.

14 **MR. FITZGERALD (by Telephone):** Right, and I  
15 don't think we're asking for anything more. I  
16 think what we're saying is unless we would  
17 find any evidence to the contrary, we're  
18 willing to accept the statement at this point.

19 But the reason this issue came up,  
20 just to answer, I think, your original  
21 question to Ron, is the fact that we didn't  
22 get that basis from the ER, and it wasn't  
23 included in the ER. And so I think we wanted  
24 to be sure that, in fact, what was, in fact,  
25 the basis for the statement.

1           **MS. BEACH:** So, Joe, this is close to being  
2 settled as I understand it unless you find  
3 something to the contrary when you're looking  
4 through your documents in the retrieval  
5 effort.

6           **MR. FITZGERALD (by Telephone):** Yeah, and  
7 again, I think this is a difficult issue.  
8 We're not going to persist in trying to prove  
9 the negative. I think all we're saying is  
10 that whether it's an account from the manager  
11 of the health physics program or a reliance on  
12 general health physics practice, I mean, I  
13 just think unless we come up with anything  
14 that suggests otherwise, we would be satisfied  
15 with this issue being settled. So I think  
16 that's where it stands now. We don't expect  
17 anything more from NIOSH other than we'll go  
18 ahead and probably settle this in the  
19 documents retrieval next month.

20           **MS. BEACH:** And I'd like to the work group  
21 members, I believe Brad has a comment.

22           **MR. CLAWSON:** I was just, I guess I'm going  
23 back to my work. We've got a written policy.  
24 Did Mound have a written policy and this is  
25 what the Meyer's --

1           **MR. STEWART:** In fact, he is quoting the  
2 written policy from the inception of  
3 operations at the laboratory in this  
4 particular excerpt. We see similar language  
5 throughout Mound's history.

6           **DR. ULSH:** Perhaps we should talk about who  
7 Herb Meyer is. Was he there at the beginning  
8 of the site? I know that at least the early  
9 health physics reports were authored by Herb  
10 Meyer.

11          **MR. STEWART:** In '47.

12          **DR. ULSH:** Okay, so he was in charge of the  
13 health physics operation from the beginning of  
14 the site, Brad. So this isn't someone who  
15 went back retrospectively. This is someone  
16 who was there when it was being done.

17          **MR. CLAWSON:** And I understand that. I  
18 guess I'm trying to paint a picture for myself  
19 of how this set up because I know that we've  
20 got written policies of certain areas. We  
21 have special areas that they have special  
22 requirements and so forth actually documented,  
23 and as the RWPs and so forth started to  
24 evaluate and so forth, that took care of a lot  
25 of that. I was just trying to paint a

1 picture. I just want to make sure we had  
2 something --

3 **MR. FITZGERALD (by Telephone):** Brad, this  
4 is Joe. I think at the last meeting NIOSH was  
5 going to see if there was a written policy,  
6 and I would assume from what was provided  
7 there may not be a written policy but there's  
8 this account, documented account, by Herb  
9 Meyers. And again, I think that may be the  
10 most definitive answer to that particular  
11 question. But it, you know, that's where we  
12 stand right now.

13 **MR. CLAWSON:** Okay.

14 **MR. FITZGERALD (by Telephone):** I think once  
15 we have the documentation and if we don't find  
16 anything that clearly contradicts any of that,  
17 then I think we can go with that.

18 **MS. BEACH:** Okay, any other --

19 **MR. STEWART:** I'll just point out one more  
20 thing. Page 49, the next to the last  
21 paragraph in the NIOSH response, the middle of  
22 the paragraph, citations from Meyer's history  
23 are given that re-articulate the policy at  
24 different points in the program's history.  
25 And once again, Meyer's history, beyond being

1 a narrative, also incorporates a very large  
2 number of policy documents and management  
3 memoranda for the program. So Meyer's history  
4 is beyond what the exceptional individual for  
5 Meyer wrote down. He kept all of this  
6 documentation, and he put it into his history  
7 which is why it's such a very large document.

8 **DR. ULSH:** And that is available on the SRDB  
9 if you want to take a closer look.

10 **MS. BEACH:** Is there any other items for 17?  
11 (no response)

12 **MS. BEACH:** So we will move on. Bob --  
13 Oh, go ahead.

14 **DR. ULSH:** Before you do that could I just  
15 ask you what the status of issue 17 is then?  
16 Is it a closed item with the option to reopen  
17 if SC&A finds something or --

18 **MS. BEACH:** Joe, at this time do you want to  
19 close that item or would you --

20 **MR. FITZGERALD (by Telephone):** Well, I  
21 think we're going through documents retrieval  
22 next month so I would anticipate, unless  
23 something arises, I mean, it's sort of a  
24 qualified close. I would close it qualified  
25 on this review that we haven't yet done of

1 documents we've requested at Mound. And  
2 that's near term. That's next month. So I  
3 don't know if that answers your question, but  
4 I think that's where it stands as status.

5 **MS. BEACH:** At this time what I would like  
6 to do is leave it open until our work group  
7 meeting. That gives you the chance to look  
8 through the documents. If nothing is found,  
9 then we will close it at the next work group  
10 meeting.

11 **MR. FITZGERALD (by Telephone):** Yeah, like I  
12 said, again, we have not found anything. We  
13 accept certainly that there's some definitive  
14 documentation, no policy, but I think, again,  
15 the history's pretty detailed. But we still  
16 want to satisfy ourselves in terms of what we  
17 see in the documents. So I think it's headed  
18 toward closure but I want to keep it open.

19 **MS. BEACH:** Thank you. We will do that as  
20 long as there's no disagreement. Let's move  
21 on.

22 Ron, are you going to take number 18  
23 to start with again?

24 **MR. BUCHANAN (by Telephone):** Yes. In the  
25 interest of time I'll talk about 18 and 19

1 together, although I would like to keep them  
2 separate in our minds because they're two  
3 separate issues. Eighteen is efficacy of  
4 external dose record, meaning is there enough  
5 dose records there to do dose reconstruction.

6 And 19 is integrity and completeness  
7 of the external dose records which means was  
8 the data transferred faithfully from one  
9 system to the other control and does the old,  
10 handwritten records match the MESH database.  
11 And this is important at Mound because they  
12 went through several databases from the old,  
13 handwritten records to electronic forms and  
14 another electronic form in the MESH database.  
15 And so what SC&A's question was, was this done  
16 faithfully.

17 And so number 18, the adequacy of  
18 external dose, now this means is there enough  
19 there to do dose reconstruction. Now I did an  
20 analysis of 22 cases as a basis for my  
21 response to 18 and 19 of Mound workers. And  
22 the spectrum of job titles I tried to get over  
23 a wide area, all the way from operators to  
24 security guards to maintenance people so that  
25 we could get a --

1                   Now this is like, I'd like to  
2                   emphasize to begin with, this is all based on  
3                   a very limited sample. In fact, only about  
4                   five percent of the claims was analyzed, 22  
5                   out of 447. And this was limited to a period  
6                   when there was some original data. You have  
7                   to realize that the handwritten, original data  
8                   only starts in the '50s and goes to the '60s.  
9                   In the '60s there are some handwritten  
10                  summaries of yearly exposures up through '68.  
11                  And after that you have no original data to  
12                  compare it to and so this is based strictly on  
13                  the '50s and '60s there is no data.

14                  And then I went to the O drive to the  
15                  MESH database and said, okay, for this worker,  
16                  for this period of time if he got a certain  
17                  amount of dose is that faithfully reproduced  
18                  in the MESH database today. And so what I did  
19                  was looked at these 22 workers, and I sent  
20                  that three-page summary out, Joe did, which  
21                  gives you a text summary on the first tab. It  
22                  gives you a summary Excel spreadsheet on the  
23                  second tab, and it gives you examples of the  
24                  records on the third tab. I photocopied the  
25                  records showing the original, the summary

1 reports and the MESH database.

2 And so what I found was that workers  
3 that I looked at that should have had dose  
4 recorded had dose recorded in most part. I  
5 mean, there were some gaps and that sort of  
6 thing, but I did not find any large gaps for  
7 set eight. The operator doesn't show a change  
8 in work habits that he's missing ten years of  
9 data out of 20 years, nothing.

10 And so I did not find at this point on  
11 the very limited sampling I did, workers that  
12 were not monitored when they needed to be  
13 monitored. And so the amount of data was  
14 there to do dose reconstruction. And, in  
15 fact, these dose reconstructions were  
16 completed that I sampled.

17 And then on the second point that the  
18 item number 19, the integrity, for example, if  
19 the person received a certain amount of gamma  
20 dose earlier was that in the MESH database. I  
21 only found one, 30 millirem was missed or  
22 something. So it was a fairly high percent  
23 of, I think on this in the reproduction of the  
24 data.

25 And so I think it's like 97 percent or

1           99 percent like that. And so we did not find  
2           any large errors in the transfer of the data.  
3           And again, this is limited to just the few  
4           originals I could find in the '50s and '60s  
5           compared to the MESH database. And so since  
6           there is no originals for the '70s, '80s and  
7           that sort of thing, I could not do any  
8           comparison from original to the MESH database.

9                     And so I guess what SC&A found out was  
10           that in this very limited sample we did not  
11           have anything that indicated right off that  
12           there was a problem. And so the working group  
13           wants to consider --

14                    Okay, there's two things I should  
15           mention though before I close those out and  
16           that is that it appears to me in this analysis  
17           that the MESH database put zeros when there  
18           was no monitoring. They put zeros in when  
19           there were zeros. They put positive values  
20           when there was positive values, but also put  
21           zeros in when there was no monitoring. The  
22           original, handwritten cards might have a dash  
23           or a blank for a cycle, but the MESH database  
24           automatically, zeros in.

25                    And this could lead to two problems,

1 cautions here is that if a worker was not  
2 badged, and the dose reconstructor looks at  
3 his MESH database, it'll say zero, and he'll  
4 assign a missed dose based on LOD over two  
5 instead of saying, okay, this worker wasn't  
6 monitored. We may need to assign coworker  
7 dose, which is generally higher than your  
8 missed dose. And so that would not be  
9 claimant favorable.

10 And also it shows that shallow doses  
11 were measured all the time. And, of course,  
12 we know, we just discussed that wasn't true  
13 because they put a zero in each of those  
14 entries. And secondly, if this database  
15 that's used for coworker data, then it will be  
16 biased low unless all the zeros are eliminated  
17 and only positive values used. That's one  
18 thing that we need to keep in mind.

19 Number two is, and I pointed this out  
20 before, and it's easily corrected, is that in  
21 the MESH database it appeared to me that the  
22 low neutron -- excuse me, the low gamma column  
23 and the neutron column are reversed. But now  
24 I did look at the dose reconstruction. Two  
25 cases had neutrons, and they used the correct

1 column even though the ^ was incorrect.

2 And so those are where we're at on the  
3 data for Mound. And at this point with our  
4 small sampling that we've done, we do not have  
5 anything that points to a serious problem.

6 **MR. FITZGERALD (by Telephone):** And let me  
7 just add that this strategy of doing a limited  
8 sampling, 20 to 30 initially and then  
9 broadening that sample if it turns out there  
10 are issues or questions, is an approach we've  
11 taken in other sites. And so in this  
12 particular initial sampling, given the  
13 results, we believe that this is a sufficient  
14 result to believe that we're in reasonable  
15 shape of completeness.

16 **MS. BEACH:** NIOSH, do you have anything?

17 **DR. ULSH:** Not much. I guess I take some  
18 comfort that you found the degree of  
19 completeness that you did and agreement. A  
20 couple of things though about some of your  
21 conclusions.

22 We're not proposing at this point in  
23 time to generate a coworker model at Mound for  
24 external dosimetry. Based on the evidence  
25 that we have that if you went into a neutron -

1 - I'm sorry, into a radiation area you were  
2 monitored. So we don't see that there is a  
3 significant unmonitored population at Mound,  
4 if any at all.

5 With regard to zeros being put in when  
6 a person was unmonitored, Ron, I think you  
7 said that what would normally happen is that  
8 an unmonitored person would be assigned  
9 coworker dose, and that it may not be claimant  
10 favorable if a person was unmonitored to  
11 assign a missed dose instead of coworker.

12 **MR. BUCHANAN (by Telephone):** Yes, that's  
13 what I said.

14 **DR. ULSH:** That's not always the case. We  
15 assign coworker dose when someone is  
16 unmonitored and they go into radiation areas  
17 either frequently or sporadically. If a  
18 person is unmonitored but does not go into a  
19 radiation area, we typically assign ambient  
20 environmental, which would be much lower than  
21 assigning missed dose.

22 So I don't think, at least in this  
23 situation at Mound where if you went into a  
24 radiation area you were monitored, I don't  
25 think that it would be claimant unfavorable to

1 assign, I guess, incorrectly assign a missed  
2 dose based on a zero that isn't real.

3 **MR. STEWART:** Yeah, I'll just observe a  
4 little more detail. In terms of dose  
5 reconstruction at Mound we do assume that  
6 those are zero dose results. They are entered  
7 as zeros. We also understand that those are  
8 not necessarily valid zero dosimeter results.  
9 Typically, we don't have cycle data so that  
10 forces us to estimate the missed dose high.  
11 And these doses do accumulate very rapidly.  
12 Typical missed doses at the Mound site are  
13 very large.

14 We would not, for the Mound site, we  
15 would not assign a coworker dose at this point  
16 because we do believe that monitored, or  
17 individuals who were exposed were monitored.  
18 And all of our case evidence suggests this.  
19 At other sites we have seen cases where an  
20 individual worker will say I did such-and-such  
21 work in 1968 through 1970, go back and don't  
22 see dose results for that work, then we'll  
23 apply coworker dose. We have not seen  
24 instances of that in Mound cases.

25 **DR. ULSH:** In large part with a couple of

1 exceptions we're in agreement. I mean, I  
2 haven't looked at the cases that SC&A --

3 **MS. BEACH:** The 22?

4 **DR. ULSH:** Right, but I guess I'd like to  
5 hear what the work group thinks about this  
6 issue. And if it requires, we could take  
7 another look, but --

8 **MR. CLAWSON:** I just want to make sure that  
9 we're taking care -- I guess part of my issue  
10 is as we have seen at other sites and so forth  
11 like that, especially not being able to, the  
12 MESH database to the original data, we really  
13 don't have a comparison, from my  
14 understanding. Is that correct?

15 **DR. ULSH:** Well, I think that comes from  
16 similar to at other sites, Brad. Starting  
17 from the beginning of operations, early maybe  
18 '40s, '50s, maybe even '60s, the method of  
19 keeping track of doses was you handwrite them  
20 on cards or whatever. At a certain point in  
21 time they went to computers, and they stopped  
22 writing the originals so it's direct entry.

23 I think that's what you've got here.  
24 You've got -- I can't remember what Ron said,  
25 maybe up into the '70s perhaps where you have

1 the original handwritten records, and then you  
2 don't see them after that. That would be  
3 consistent with Mound doing what they did at  
4 other sites, and that is direct entry into the  
5 computer records.

6 **MR. CLAWSON:** Well, I guess this is kind of  
7 where I get into the thing -- and we've looked  
8 at this at many different sites and so forth  
9 like that is, going from the paper to the  
10 database. How many different databases have  
11 we been through at Mound? I was trying to go  
12 through it. There was PORECON --

13 **DR. ULSH:** Well, hold on. There was XRAD?

14 **MR. STEWART:** The first one was EXAS, E-X-A-  
15 S. That's an external dose system. I believe  
16 that was an IBM-based system. And then that  
17 was migrated I think to MESH. And that became  
18 their external database. In fact, I think  
19 it's all their health records. PURECON is the  
20 plutonium database. PORECON is the polonium  
21 database.

22 **DR. ULSH:** And that was, I think -- I might  
23 have this wrong. If Liz is on the line, she  
24 can correct me. One of those was used by MJW  
25 in their dose reconstruction. They got it

1 from a site, PURECON I think. And I think MJW  
2 created PORECON. It might be the reverse of  
3 that. So there's been a couple migrations,  
4 Brad, but not a lot.

5 **MR. CLAWSON:** So what about the shallow, you  
6 know, we talked a little bit earlier about the  
7 shallow dose and so forth like that and the  
8 low gamma I believe is what it was, and there  
9 were zeros in that. We've already looked  
10 earlier that we kind of had a flaw in that in  
11 the earlier years. I guess I was just  
12 wondering how we're going to handle those  
13 zeros in that area.

14 **MR. STEWART:** The zeros in that area?

15 **MR. CLAWSON:** Yeah, because -- I'm jumping  
16 back and forth but, you know, earlier we were  
17 talking about shallow dose versus deep dose.  
18 Now we're seeing zeros in these areas but we  
19 knew that we had these issues and problems.

20 And I'm just wondering how we're  
21 tracking, how are we going to handle those  
22 zeros in that area. Because we showed a flaw  
23 early on somewhat that they were having  
24 problems. When I say flaw, I'm not saying  
25 they were just having trouble doing this. And

1 I'm just wondering how we're going to handle  
2 all those zeros in that area.

3 **MR. STEWART:** We can go back and look at the  
4 data. Once again, we have reliably measured  
5 photon doses throughout Mound's history, and  
6 since those data are based on individual  
7 measurements associated with the individual  
8 whose dose we're reconstructing, that would be  
9 the most accurate place to start in terms of a  
10 possible proportional dose from low energy  
11 gamma.

12 **DR. ULSH:** So what you're talking about I  
13 think is similar to estimating a neutron dose  
14 by n/p ratio, I think what you're talking  
15 about is if you've got a deep dose, it might  
16 be possible, if appropriate, to apply a factor  
17 to, a deep-to-shallow ratio. We can live with  
18 that.

19 **MR. CLAWSON:** I'll just be right honest  
20 here. What I've heard from some of the  
21 petitioners at Mound and so forth like that,  
22 they're not sure how, you know, we've got zero  
23 doses here. We understand that there was some  
24 problems in that, but I'm still showing zeros  
25 in these areas and how are we going to deal

1 with and take care of that. I guess my  
2 suggestion I'd like to be able to see how  
3 we're handling this process and go from there.

4 **MR. STEWART:** Yeah, we will publish that in  
5 the revision of the TBD.

6 **DR. ULSH:** We will, but I think we need to  
7 address Brad's question a little, before the  
8 official version of the TBD comes out. How  
9 about if we take it as an action item to  
10 present to you a strategy for estimating  
11 shallow dose at Mound? Or at least to  
12 summarize why we think it's not an issue if  
13 that's what we think.

14 **MR. CLAWSON:** Yeah, and that's just what  
15 we're trying to cover and so forth especially  
16 how and that will be taken into the zeros and  
17 so forth and their shallow doses and so forth  
18 like that.

19 **DR. ULSH:** Okay.

20 **MS. BEACH:** Will we do that under the  
21 shallow dose issue?

22 **DR. ULSH:** I don't know. Where is it most  
23 appropriate to do that?

24 **MS. BEACH:** I think possibly at the, at 16.  
25 What do you think, Brad?

1           **MR. CLAWSON:** Well, actually, and this is  
2 kind of where they overlap, it's in 16 and 19.  
3 I think as we get into 16 it'll take care of  
4 the shallow, but we need to be able to see how  
5 we're going to implement that and so forth in  
6 19.

7           **MR. FITZGERALD (by Telephone):** Sort of a  
8 broader question in how one implements the  
9 issue of zero --

10          **MR. CLAWSON:** Right.

11          **MR. FITZGERALD (by Telephone):** -- as actual  
12 data. And that's both shallow as well as the  
13 one that Ron was discussing a minute ago.

14          **DR. ULSH:** So how about if we take on 16 an  
15 action item where we will summarize the  
16 history of shallow doses at Mound and how it  
17 was or was not monitored? And then under 19  
18 we'll talk specifically about zeros and  
19 whether or not they're real zeros in terms of  
20 shallow dose.

21          **MR. CLAWSON:** And how it was implemented.

22          **DR. ULSH:** Does that sound reasonable?

23          **MR. CLAWSON:** Yeah, that's great.

24          **MR. FITZGERALD (by Telephone):** This is Joe  
25 again. Under 19, Brant, you mentioned

1 something about summarizing QA/QC steps taken  
2 during the transfer of data. Is that  
3 something that would be forthcoming or are you  
4 going to refer to the, I guess, the documents  
5 that exist? How are you handling that?

6 **DR. ULSH:** To be honest with you, Joe,  
7 that's not one that we've had a lot of action  
8 on since the last working group meeting.  
9 We've been focusing on the road map which  
10 we'll get to later.

11 **MR. FITZGERALD (by Telephone):** Right, okay,  
12 just wanted to check on that. I think that  
13 was addressing Brad's earlier, he was getting  
14 into that issue as well.

15 **DR. ULSH:** I guess at the end --

16 Well, go ahead, Brad.

17 **MR. CLAWSON:** I was just going to say I  
18 guess that basically does the QA of the MESH  
19 databases, the data transfer or whatever, but  
20 that was kind of, that's not one, that's kind  
21 of one that's back there.

22 **DR. ULSH:** At the end, Josie, maybe if we  
23 could talk about your priorities in terms of  
24 what issues you want to see action on.

25 **MS. BEACH:** That's what we've got settled

1 for the end of the day.

2 And just for the record our designated  
3 federal official has now joined us live.

4 **DR. WADE (by Telephone):** Chia-Chia,  
5 welcome. This is Lew. I've been sitting in  
6 for you, but I'll let you assume the mantle  
7 now. I'm available by telephone any time if  
8 you need me, Chia-Chia.

9 **MS. CHANG:** Hi, is this working? Can you  
10 hear me?

11 **DR. WADE (by Telephone):** Yes.

12 **MS. CHANG:** Thanks a lot, Lew, and I  
13 apologize for being late, and thank you for  
14 everybody's patience.

15 **DR. WADE (by Telephone):** Bye now.

16 **MR. CLAWSON:** But Lew, it's always good to  
17 hear from you.

18 **DR. WADE (by Telephone):** Thank you. It's  
19 good to listen.

20 **MS. BEACH:** Okay, do we have anything more  
21 on 19, 18 or 19?

22 **MR. BUCHANAN (by Telephone):** This is Ron  
23 Buchanan, and I want to make one summary point  
24 on the importance of the zero in the MESH  
25 database is that in some dose reconstructions

1 I have seen where it says, okay, the worker  
2 has all zeros for neutrons or shallow or  
3 whatever -- not just shallow but for neutrons,  
4 too -- for this ten-year period. And he  
5 showed no positives so we don't assign a dose.

6 And so this is the problem I see with  
7 a database which automatically puts zeros in.  
8 The dose reconstructor can think, oh, he was  
9 monitored. He got all zeros. He doesn't need  
10 a dose or just missed dose or something like  
11 that. And so this was the main point I wanted  
12 to make about the zeros being entered  
13 automatically.

14 **DR. ULSH:** I understand what you're saying,  
15 but if it hinges on, I guess it comes down to  
16 whether or not you, the working group, has  
17 confidence in if someone went into a radiation  
18 area, then they were monitored. If that's the  
19 case, if you accept that, then I don't think  
20 we have an issue here because we're assigning,  
21 you know, as Don said, particularly in the  
22 early years when we don't have cycle data,  
23 we're assigning a lot of missed dose because  
24 we take the worst assumptions in terms of how  
25 many badges he might have worn. If you don't

1                   have confidence in that, then we might have an  
2                   issue that we need to discuss further. So I  
3                   would put that in the working group's hands.

4                   **MR. SCHOFIELD:** How good is the data that  
5                   you know of, historical data that they had for  
6                   monitoring the neutrons at the facilities?

7                   **DR. ULSH:** For neutrons?

8                   **MR. SCHOFIELD:** Yes.

9                   **DR. ULSH:** Well, it appears to be pretty  
10                  complete. We haven't noticed any big gaps in  
11                  terms of that.

12                 **MR. SCHOFIELD:** And so there are records of  
13                 them doing assays and --

14                 **DR. ULSH:** Oh, certainly, there are records  
15                 of people being assigned NTA films or later  
16                 neutron TLDs. There are also records which we  
17                 have as an action item to share in terms of  
18                 measuring the spectral, the neutron spectrum  
19                 and also n/p ratio measurements. Does that  
20                 answer your question, Phil?

21                 **MR. SCHOFIELD:** Yes.

22                 **MR. CLAWSON:** I guess my question is, is I  
23                 understand, and I've watched this at many  
24                 different sites and so forth like that. We  
25                 have a lot of people that should have been

1 monitored, well, and that were monitored. And  
2 when we say that should have, would have,  
3 could have, I'm not meaning anything by that  
4 but I guess part of my thing is what we've  
5 also seen is people not routinely going into a  
6 radiation area all of a sudden show up with  
7 something, and they say it's, this person  
8 doesn't really work in that area so it's just  
9 a false positive, a secretary, you know,  
10 different little things like that.

11 I just want to make sure that we're  
12 covering these people because these people,  
13 because these people may have, well, I've got  
14 a badge. I can go into these areas. It's not  
15 a big deal. And then all of a sudden they're  
16 getting doses or whatever like that, and it's  
17 not being recognized.

18 **MR. STEWART:** Well, let must assure you that  
19 anyone who has a recorded dose at Mound, that  
20 dose is used to reconstruct their total dose  
21 regardless of their job title.

22 **MR. CLAWSON:** Well, and I realize that, and  
23 I'm not saying about you guys. But what I'm  
24 saying is the Mound standpoint because we  
25 still see it today in today's areas that,

1 well, this is basically a false positive  
2 because this person does not go into these  
3 types of an area. As a matter of fact in our  
4 areas there are people that aren't wearing  
5 badges anymore, and I think it's the pendulum  
6 theory. We're going back to what it was in  
7 the early years. And unfortunately, I think  
8 it will bite us, but that's a different issue.

9 **DR. ULSH:** I understand what you're saying,  
10 Brad. I think that's going to be more of an  
11 issue at sites where people have access to  
12 radiation buildings but don't, but there are  
13 parts of the buildings where it's a radiation  
14 area and parts that are not. I think that's  
15 where it gets into trouble.

16 **MR. CLAWSON:** Yeah, well, in the worker  
17 interviews we went through this and several of  
18 the people that we've discussed -- and this  
19 is, this is a problem that we find in many  
20 different sites. We have a building that has  
21 several different radiation areas in it and so  
22 forth like that, and some that aren't.

23 And basically the ones that aren't  
24 they're saying, well, you don't need to be  
25 badged here. But you go through all these

1 other ones to get to the other ones, but you  
2 don't work in a radiation area. Just want to  
3 make sure that we're, I guess the badging  
4 requirements and so forth like that. I  
5 understand that they had a policy there, but  
6 that's working in the area that I think I'm  
7 looking at someone that didn't.

8 Because in the interviews we had  
9 several people that discussed that, no, I  
10 worked in this building. I didn't work in the  
11 radiation areas so therefore I wasn't badged,  
12 but I still went through these areas, and I  
13 still did these things. That's kind of what  
14 I'm getting at with this. I know it's  
15 roundabout, but we see this at numerous sites,  
16 and I just want to make sure that we're, how  
17 we're kind of handling some of that.

18 **DR. MAURO (by Telephone):** This is John  
19 Mauro. I have a question related to this  
20 matter. Can you hear me okay?

21 **MS. BEACH:** Yes.

22 **DR. MAURO (by Telephone):** Ron, when you  
23 looked at the sample sets of cases, did you,  
24 when you were going through them, was there  
25 any indication that individuals that were not

1 monitored, let's say in other words did you  
2 have cases where, let's say, over some time  
3 period the worker was not badged, and it  
4 certainly appeared to you based on the record  
5 that there was no reason to badge them. This  
6 goes to the question of when we see that a  
7 person was not badged, and he was assigned a  
8 zero. Right now what I'm hearing is, well,  
9 there's good reason to believe he really did  
10 not enter a radiation area, and he should be  
11 assigned a zero for the dose or just ambient  
12 as they mentioned. Any indication from the  
13 sampling that you did look at that that kind  
14 of situation existed?

15 **MR. BUCHANAN (by Telephone):** Yes, this is  
16 Ron Buchanan. Yes, that is true. That's the  
17 reason there's 22 instead of 20. I originally  
18 planned on 20 workers, but the two last ones  
19 did not have badges. And I believe they had  
20 perhaps X-ray data and a spot bioassay if I  
21 remember right, but no badges. But they were  
22 secretaries and packing technician or  
23 something. And so I did look at two besides  
24 what I expected to be badged, and the two that  
25 I looked at that I didn't expect badged were

1 not badged.

2 **DR. MAURO (by Telephone):** Okay, thank you.  
3 That was my question.

4 **MR. STEWART:** And just a little more detail  
5 on that. I've seen quite a number of claims  
6 where the workers had job titles associated  
7 with non-radiological weapons parts. They  
8 call them small parts workers. They worked  
9 with adhesives and plastics and things of that  
10 nature.

11 I have one individual who was for a  
12 number of years a small parts worker. And the  
13 records in MESH said not monitored. At some  
14 point she transferred and became a radiation  
15 protection technician and was badged early in  
16 the, right when she first transferred over,  
17 did that work for approximately a year and  
18 then went back to small parts. And then once  
19 again we see the records go back to n-slash-m.

20 **DR. ULSH:** A couple of things that are  
21 different at Mound, and this is not  
22 necessarily from a radiation protection  
23 standpoint but from a tight security  
24 standpoint. If you didn't work in SM, it's  
25 not a building you just wandered through.

1                   There are a couple situations, Brad,  
2                   like you mentioned where you might have had to  
3                   walk through a hallway to get to a different  
4                   building in other parts, but you didn't go  
5                   into TP Building or SM Building unless you  
6                   worked there unless you were just passing  
7                   through a little corridor.

8                   The other thing to keep in mind is  
9                   unlike a lot of other sites, Mound had a very  
10                  large component of work -- Don mentioned it --  
11                  that was not related to radiation. They did a  
12                  lot of explosives work and that kind of thing  
13                  where you wouldn't expect to see radiation  
14                  monitoring. So that perhaps is a little  
15                  different from some other sites as well.

16                 **MR. CLAWSON:** This is Brad. And we saw this  
17                 in the interviews. This is what's interesting  
18                 about all these complexes. You can't, unless  
19                 you get to the gaseous diffusion plant, they  
20                 had one main issue. But you get to these  
21                 other ones, and they had a lot of different  
22                 stuff going on, and people crossing from one  
23                 end to the other.

24                         But see, this is where the disconnect,  
25                         I think, really comes in how did we monitor

1           these. And this is where we get into the  
2           procedure process because a lot of times they  
3           were changing back and forth. And then you  
4           get into the roving maintenance people and so  
5           forth like that, and that really became  
6           interesting to me to be able to listen.  
7           Because if they needed people, they needed  
8           stuff now, and you can go back at the building  
9           and the facilities and so forth like that.

10                   They started out as this, but by the  
11           time they came to the end, they'd built inside  
12           of rooms, inside of buildings and everything  
13           else like that to be able to do new processes  
14           or so forth like this. And I just want to  
15           make sure that we're looking at how this all  
16           came about because there is quite a history  
17           there.

18           **MR. STEWART:** You bring up an issue that was  
19           documented in Mound's history, and that is  
20           routine badging versus non-routine badging,  
21           and it was an issue that a number of  
22           maintenance personnel were not issued badges  
23           on a periodic basis like the people who were  
24           working the production areas were. This  
25           quickly became a problem as additional

1 maintenance and modifications were required  
2 because those personnel were required to get a  
3 badge when they entered the area.

4 And soon the cost of doing, and it was  
5 only a daily badge, but they called them  
6 visitor badges, when in fact they were for any  
7 personnel entering the area that did not have  
8 a routine badge. Those numbers quickly passed  
9 the numbers of routine badges that they  
10 processed.

11 **MR. CLAWSON:** Well, I go back to one of the  
12 electricians or so forth that we interviewed  
13 in the Mound discussions and so forth like  
14 that. And he was just talking about, well,  
15 no, I wasn't classified as a radiation worker,  
16 but we run power over to these facilities and  
17 because we weren't -- where the boundaries of  
18 the facility ended it didn't stop him by a  
19 badge.

20 And he actually went into some of  
21 these areas and so forth like this. And I'm  
22 sitting there, well, how were you monitored or  
23 so forth. Well, I wasn't required to be  
24 monitored. But he was going into these  
25 buildings to run these lines. And I know that

1                   this was more in the early years and so forth  
2                   like that, and as security increased and so  
3                   forth like that, it kind of took care of some  
4                   of that because getting into the areas.

5                   But I just want to make sure that  
6                   we've got a process to be able to take care of  
7                   that. You know, this kind of falls back into  
8                   several of these different issues. I don't  
9                   know where we could put it into one.

10                  **MS. BEACH:** It really goes into issue 17 I  
11                  think. The one we qualified closed. It's the  
12                  badging policies used. The Meyer statement  
13                  also talks about occasional visitors. So it  
14                  seems like there's still some questions on how  
15                  people were badged.

16                  **MR. CLAWSON:** And I guess this will come up  
17                  with SC&A. I just want to make sure because I  
18                  know that I want to make sure that these zeros  
19                  are being taken care of and so forth.

20                  **MR. STEWART:** Just to address that, Brad. I  
21                  think what you're talking about is what we  
22                  would call ambient dose rate, something an  
23                  individual could access just by being on the  
24                  Mound site and not entering the controlled  
25                  area. Currently, any area that an individual

1                   went into that required badging was posted as  
2                   controlled. It is likely the case in the  
3                   early days as well.

4                   In case it's not we include in every  
5                   dose reconstruction an ambient dose. That's  
6                   when the person's not monitored. And the  
7                   ambient dose that we assign is based on the  
8                   highest measured outdoor dose on site. And I  
9                   don't remember offhand where that is, but we  
10                  have those values. And even an ambient dose  
11                  is a considerable amount of dose, at least in  
12                  terms of what people typically receive now on  
13                  their TLDs.

14                 **MR. CLAWSON:** Yeah, and I understand that.  
15                 I know where this one came from was I believe  
16                 there was a radon issue and basically what  
17                 they got into was this, to be able to run this  
18                 electrical system, they went through the  
19                 tunnel and in his recollections they weren't  
20                 monitored and so forth. So this is kind of  
21                 where I get back to this.

22                 I know that we had a policy in there,  
23                 but how, it seems like it's a little bit  
24                 lacking in some areas. But I'm sure this will  
25                 come up as we go through the process. I'm

1 just trying to make sure you kind of get an  
2 overview of what we've seen, and what we've  
3 heard as the working group myself of kind of  
4 the badging policy. And that's why we  
5 question some parts of this. But I'm sure as  
6 Joe goes through this inspection and so forth  
7 like that that it'll come out.

8 **MR. STEWART:** We feel the highest measured  
9 ambient dose rates to all individuals at all  
10 times is claimant favorable and inaccurate,  
11 obviously inaccurate, but claimant favorable  
12 method of estimating what they might have  
13 gotten if they were walking around controlled  
14 areas but not entering them.

15 So it's one of those things that we  
16 build favorability for the claimant rather  
17 than going back and trying to estimate their  
18 point dose rates during their entire career.  
19 It's simply not possible for us.

20 **MR. SCHOFIELD:** What about, say, some of the  
21 office workers who worked in the office  
22 literally just almost right next door to some  
23 of these processing areas and stuff. They  
24 were never badged and, true, they didn't go  
25 down into these areas. They didn't go around

1           it. Yet from different information I've seen,  
2           these people were getting a dose just because  
3           of the, but yet they were not monitored for  
4           this. Are you going to take a different  
5           ambient dose?

6                     I mean, it's a common problem. I  
7           mean, you can have a processing building here  
8           and right over here you have an office  
9           building. Yeah, you've got a security fence  
10          or something maybe dividing them, but there is  
11          dosage coming across. Just because that  
12          security fence is there, doesn't stop the  
13          dose.

14                    So these people who worked in this  
15          office are going to get some dose, but they're  
16          never badged because they never go on this  
17          side of the fence. So are you using different  
18          ambient doses or are you taking a general  
19          average?

20                    **DR. ULSH:** No, we're taking the highest.

21                    **MR. SCHOFIELD:** You're taking the highest?

22                    **DR. ULSH:** The highest measured on site.

23                    **MR. SCHOFIELD:** Okay, for everybody who's  
24          not monitored?

25                    **MR. STEWART:** We can in some cases if we

1           felt that we needed to moderate that a little  
2           bit, we could do that if we knew where a  
3           person worked, and we knew that no way could  
4           they have gotten that highest dose rate all  
5           the time. We could go back, and we could use  
6           the data and say, okay, while they were here,  
7           the dose rate here is most closely  
8           approximated by this measurement, take a  
9           claimant favorable, but less claimant  
10          favorable assumption for that one individual.  
11          In fact, we don't usually get to that level of  
12          detail and simply assign the class.

13                **MR. SCHOFIELD:** Okay, that's what I wanted  
14                to know.

15                **MS. BEACH:** So at this point 18 and 19 I  
16                don't believe we're ready to close those out.  
17                Do we have agreement there?

18                **MR. CLAWSON:** Yes.

19                **DR. MAURO (by Telephone):** Josie, this is  
20                John Mauro.

21                **MS. BEACH:** Hi, John.

22                **DR. MAURO (by Telephone):** I have just one  
23                quick question. When you look at the records,  
24                is it self evident which zeros are zeros  
25                because the person was monitored and the

1 reading was below the detection limit and they  
2 reported zero, and those people who were just  
3 monitored -- I'm sorry, those people who were  
4 not monitored and perhaps deliberately were  
5 not monitored? Is it self evident the  
6 distinction between those two different kinds  
7 of zeros?

8 **MR. STEWART:** Not always, usually not. And  
9 for that reason we typically assume that they  
10 are monitored and assign the missed dose.

11 **DR. MAURO (by Telephone):** So on other sites  
12 this type of zero issue was very important.  
13 But you're saying in this particular case  
14 there's good reason to believe that when a  
15 zero was assigned because the person wasn't  
16 monitored, there's good reason to believe he  
17 did not experience any dose other than  
18 ambient. And I think that's a very important  
19 rock that you're standing on, and I wanted to  
20 just alert everyone to that.

21 **MR. FITZGERALD (by Telephone):** Yeah, and  
22 this is Joe. I think when I said we were  
23 going to get more data and more documents it  
24 was really to test the thesis that -- and we I  
25 think are on the same place that we've

1 interviewed people, we've looked at  
2 documentation. Certainly, Mound's history  
3 suggests that you didn't enter rad-controlled  
4 areas unless you were badged and had business  
5 in that particular building.

6 And that sounds like again a pretty  
7 strong operating principle. However, we want  
8 to validate that, or continue to validate  
9 that, that we didn't have, say, security  
10 guards, maintenance people, crafts people  
11 entering these areas without in fact getting a  
12 building-specific badge which was the  
13 practice.

14 And so we'll be certainly very  
15 attentive to that particular issue because to  
16 my way of thinking that would be the only  
17 place where this notion of high ambient would  
18 not be correct if, in fact, you had people  
19 that were entering these areas. But it's not  
20 likely, at least at this point, from our  
21 interviews and what we've seen.

22 **MR. GIBSON (by Telephone):** Josie, this is  
23 Mike. Can I make a comment?

24 **MS. BEACH:** Yes, you sure can, Mike.

25 **MR. GIBSON (by Telephone):** And I know it's

1           inappropriate. I'm a member of the public,  
2           and I just want to make a comment for the  
3           record. There were several areas where people  
4           could just wander through controlled areas,  
5           hot buildings, and there were employees who  
6           were stationed in non-rad areas that did work  
7           in controlled areas and may have not been  
8           monitored. And I'll get that information to  
9           the work group or SC&A at the appropriate  
10          time. I just, I had to challenge the  
11          statements that were made earlier.

12          **MS. BEACH:** Thank you, Mike. I also  
13          suggested that we interview you officially so  
14          you'll be looking forward for that at a future  
15          date.

16          **MR. GIBSON (by Telephone):** That's fine,  
17          thanks.

18          **MS. BEACH:** I have been asked to give us a  
19          short break. If there is no objection or any  
20          other comments you must make on this issue,  
21          when we come back from break we're going to  
22          move on to issue number nine in trying to stay  
23          somewhat on schedule. We're already a half  
24          hour behind our schedule, an hour if you must  
25          know the truth.

1                   Any objections to us -- how much time,  
2 five minutes or ten? We're going to take a  
3 ten minute break. We will leave the line open  
4 although we'll be on hold.

5                   (Whereupon, a break was taken between 11:05  
6 a.m. and 11:15 a.m.)

7                   **MS. CHANG:** We're starting back now on  
8 Mound. We will proceed in one second. I just  
9 wanted to remind everybody to please put your  
10 phone on mute unless you're talking.  
11 Preferably don't put us on speaker phone. If  
12 you don't have a mute button, use star six,  
13 and then when you need to speak you can unmute  
14 by pushing star six. And then when you finish  
15 speaking please do mute yourself again with  
16 star six. All right, end of speech. Thank  
17 you.

18                   **HIGH FIRED PU-238 MATIRX ISSUE #9**

19                   **MS. BEACH:** We are going to go ahead and  
20 move on to issue number nine in the matrix,  
21 the high-fired Plutonium-238, matrix issue  
22 number nine.

23                   **MR. CLAWSON:** Josie, before we start I just  
24 want to make a comment. You know, I  
25 understand that we refer to Meyers in a lot of

1 sense, but this kind of an issue of mine is  
2 that I know he's a subject matter expert, but  
3 he's justifying his process that he's built.

4 You know, he goes clear back to the  
5 beginning of this so I want to take one thing  
6 in context and that is is that we're referring  
7 to this man, and it's just like me. I am not  
8 going to tell you all my flaws that I have  
9 even though they come out quite often. And in  
10 these processes and stuff he's justifying his  
11 process that he has set up. I just want  
12 always -- why people are a little bit leery  
13 about that when we're using this as a  
14 controlling document.

15 There's kind of a little bit of a  
16 conflict there because he was it. But I know  
17 that we need to be able to use it as a subject  
18 matter expert or whatever else like that. But  
19 I just want to go on record as saying that  
20 he's basically justifying his process.

21 **MR. STEWART:** Well, I'll just reiterate what  
22 I said earlier. A lot of the value that we  
23 get from Meyer is the very large number of  
24 program documents that he integrates in his  
25 history.

1           **MR. CLAWSON:** Right, and I understand that.  
2           I just want to go on record as stating that we  
3           do use him. And it's just like any site, we  
4           use him as somewhat of a subject matter  
5           expert. And as dose reconstructors or NIOSH  
6           or whatever, if they can take that  
7           information, and they can be able to justify  
8           it and so forth just as we do in the process.  
9           But I just wanted to make sure that we're  
10          aware of that.

11          **MS. BEACH:** Thank you. And it's my  
12          understanding we only have Elizabeth and Tom  
13          until noon, so we'll go ahead and let you  
14          start at this time.

15          **DR. ULSH:** I'll just give you an overview  
16          and then let the people who really know what  
17          they're talking about jump in. This is Brant  
18          Ulsh at NIOSH. We sent out, I think on the 4<sup>th</sup>  
19          of July, maybe the 3<sup>rd</sup>, our position paper, our  
20          white paper on ceramic Plutonium-238 at Mound.  
21          This was in response to a concern raised by  
22          SC&A sometime ago in a paper that they in turn  
23          produced, mainly Joyce Lipsztein.

24                         And the question had to do with, well,  
25          we have -- if I can briefly summarize -- we

1           have a method for estimating high-fired  
2           Plutonium-239, but what we have at Mound is  
3           Plutonium-238, and we have that certainly in  
4           high-fired or ceramic forms. So do we have an  
5           issue in terms of estimating dose from that  
6           particular form of that particular  
7           radionuclide.

8                     One part of the concern was based on  
9           an incident that happened at Los Alamos where  
10          they took an RTG apart at Los Alamos, and they  
11          observed some unusual behavior from the  
12          Plutonium-238 in that incident. In that it  
13          was initially at least very, very insoluble,  
14          similar to what we see with high-fired  
15          Plutonium-239.

16                    Over time the solubility increased, in  
17          other words more was leaving the lungs and  
18          coming out in the urine and going to other  
19          parts of the body. But that was an unusual  
20          behavior, and the question was raised would we  
21          expect to or have we looked to see whether  
22          that is an issue at Mound.

23                    So in response to that Tom LaBone and  
24          Liz Brackett of the ORAU team put together  
25          this white paper. And the bottom line, at

1 least the bottom line that I can come up with  
2 from this paper, is that we looked at the  
3 cases of the people who were involved at Los  
4 Alamos, looked at their bioassay histories.  
5 And then we also looked at approximately 900  
6 cases from Mound. And we simply did not see  
7 that kind of behavior in any of those cases  
8 from Mound.

9 So one part of our position is that  
10 this is just not an issue at Mound based on  
11 what we see there. The second part of our  
12 position though is even if you were concerned  
13 about this particular material behaving this  
14 way at Mound, it can be modeled. And that's  
15 based in large part on an examination of this  
16 material done by Tony James and published in  
17 Health Physics.

18 So if we determined that that was an  
19 issue, then we would simply be able to apply  
20 that model. But it's our position that that  
21 is not an issue based on the 900 cases that  
22 we've looked at.

23 Tom and Liz, do you want to go into  
24 any more depth or add anything?

25 **MR. LaBONE (by Telephone):** No, no, we'll

1 just see where the questions are.

2 **MR. CLAWSON:** Particulate size, was that an  
3 issue?

4 **DR. ULSH:** I don't think it would be, Brad,  
5 because we're basing it on urinalysis.

6 **MR. CLAWSON:** What's this cascade impact  
7 factors?

8 **DR. ULSH:** Where are you looking?

9 **MR. CLAWSON:** It's just something I wrote.  
10 It was in the work area.

11 **MR. CHEW:** We use that to determine particle  
12 sizes. It's basically like different levels  
13 of sieves that measures different micron sizes  
14 and the air passes through it, and it gets  
15 captured in a different level. But I don't  
16 know where the question comes from.

17 **MR. CLAWSON:** Well, one of the things was  
18 was that Mound purchased this cascade  
19 impactor, but did not complete the evaluation  
20 or process that was never used.

21 **MR. CHEW:** Never used? Yeah.

22 **MR. CLAWSON:** And so in theory they were  
23 basically saying that they were questioning  
24 the monitoring process they were having for  
25 the high-fired oxides. Were they really

1                   checking for what happened? Because they  
2                   bought a lot of this equipment, came in, but  
3                   it was never fully implemented or put into the  
4                   process.

5                   **MR. CHEW:** Usually the cascade impactors  
6                   were, tried to be in close to near the  
7                   breathing zone. So you really have to have  
8                   enough activity to have release because of an  
9                   incident before the cascade impactor really  
10                  works.

11                  **DR. ULSH:** But that's only an issue if  
12                  you're calculating internal doses or intakes  
13                  from air concentrations. It's not an issue,  
14                  as I understand it, -- and I'll let internal  
15                  dosimetrists correct me if I'm wrong -- that  
16                  is not an issue if you're looking at  
17                  urinalysis results or fecal results.

18                                 Is that correct, Liz or Tom?

19                  **MS. BRACKETT (by Telephone):** You can use  
20                  different particle sizes, and you would get  
21                  different answers even from bioassay. But, I  
22                  mean, in general this issue, you know, we  
23                  assume five microns because that's the ICRP  
24                  default unless there is other information. A  
25                  lot of times it doesn't make a very large

1 difference given the relatively small range of  
2 respirable particles.

3 **MR. CLAWSON:** Well, I guess it comes back to  
4 how are they determining the proper PPE for  
5 this process where this wasn't even  
6 implemented into so we're sitting there saying  
7 that we don't have, this process was never  
8 implemented in and was never finished. How  
9 are we determining what the proper PPE was to  
10 the process? Were we, just to me it just kind  
11 of shows that they were trying to determine  
12 how the right size and everything else like  
13 that. We want to make sure, how do we know  
14 we've got the right PPE for all this?

15 **DR. ULSH:** We don't. And it doesn't matter  
16 because we don't take that into account in a  
17 dose reconstruction.

18 **MR. CHEW:** They wouldn't use that for the  
19 PPE.

20 **MS. BRACKETT (by Telephone):** Right, I  
21 misunderstood the question. Right, that does  
22 not impact the dose reconstruction at all  
23 based on bioassay.

24 **MR. CLAWSON:** Okay.

25 **MS. BEACH:** I have a comment. It was my

1                   understanding -- and SC&A can probably answer  
2                   this -- it was my understanding that the LANL  
3                   was just an example in your white paper, and  
4                   it seems like it's being used a little bit  
5                   different with NIOSH. Do you --

6                   **MR. FITZGERALD:** This is Joe, and I think  
7                   Joyce will come in, too. I think Brant  
8                   correctly characterized how we did this. We  
9                   wanted to demonstrate that there was some  
10                  question about whether a high-fired phenomenon  
11                  existed with PU-238 and offered the LANL case  
12                  as sort of an illustrative example of the  
13                  phenomena.

14                 And our question, which I think NIOSH  
15                 responded to in the white paper, was whether  
16                 that phenomena has implications for Mound.  
17                 And I think the white paper draws the  
18                 distinction that the LANL example doesn't  
19                 apply phenomenologically to Mound. I think  
20                 that issue is helped by the white paper. I  
21                 think that that's something we weren't fully  
22                 aware of.

23                 But where we are now is I think we can  
24                 agree conceptually that if one could model the  
25                 Mound cases as laid out and have perhaps the

1 so called Type J solubility model, the James  
2 model, as an upper bound for those cases that  
3 might come up that don't tack with the  
4 conventional model, and that certainly would  
5 be an approach.

6 I think our issue at this point is  
7 more in the details of how that would be done.  
8 You know, for example, in cases, we're  
9 assuming the 896 cases, are they plutonium  
10 cases pre-alpha spec? There wasn't much,  
11 maybe I missed that in the white paper.

12 **MS. BRACKETT (by Telephone):** It's all of  
13 the cases that were in, I believe it was  
14 PURECON. And PURECON goes through 1980 --

15 **MR. FITZGERALD:** Yeah, that's sort of a  
16 complete rendition then.

17 **MS. BRACKETT (by Telephone):** Right.

18 **MR. FITZGERALD:** I guess my question, and  
19 Liz, I think you brought it up in some sense  
20 in the first meeting, which is for those cases  
21 that you don't have very much data for, maybe  
22 not enough to really see that curve, how would  
23 you go about determining whether or not the  
24 conventional model would be applied?

25 It's the issue of this may be what

1 fits the vast majority of cases, but if you do  
2 have some cases by virtue of the particular  
3 compound or whatever that might not, would  
4 they be identifiable do you believe with the  
5 data you have? And what would you do if the  
6 data wasn't sufficient for the IMBA fit? Just  
7 more or less how would you implement this in  
8 practice?

9 **MS. BRACKETT (by Telephone):** Well, I think  
10 that the paper addresses that to some extent.  
11 One issue is that in a lot of cases where  
12 there aren't a lot of data, the results are  
13 all less than the detection limit, and in  
14 those cases we typically assign a chronic  
15 intake. And there are some comparisons done  
16 in there to show, I believe, that the -- is it  
17 Type S that's limiting?

18 **MR. LaBONE (by Telephone):** After a certain  
19 --

20 **MS. BRACKETT (by Telephone):** After a  
21 certain amount of time one of the  
22 conventional, you know, Type M or Type S is  
23 limiting. If that's not the case, then we  
24 could certainly apply the Type J and make that  
25 assumption if it's outside of the bounds where

1                   one of the others is limiting.

2                   In the cases where there perhaps are  
3 random positive results, one thing with this  
4 type is that you see an increase in excretion  
5 over time. So if you had an early result that  
6 was positive, and then later results that are  
7 negative, then that's an indication that you  
8 don't have this material types because the  
9 earlier excretion was larger than the later  
10 excretion. So you can make a judgment based  
11 on that if there were later data that showed  
12 the excretion rate had dropped off.

13                  **MR. FITZGERALD:** Now, I guess going to that  
14 question, these 896 cases showed no early  
15 insolubility. Have there been any cases that  
16 suggest otherwise?

17                  **MS. BRACKETT (by Telephone):** I'm sorry. I  
18 didn't hear the first part of that.

19                  **MR. FITZGERALD:** It's indicated that the 896  
20 cases from PURECON showed none of this sort of  
21 early insolubility phenomenon, sort of similar  
22 to Los Alamos. Were there any cases -- this  
23 is sort of the converse -- have there been any  
24 cases that don't track with that conventional  
25 experience?

1           **MR. LaBONE (by Telephone):** Any cases in the  
2 complex or at Mound?

3           **MR. FITZGERALD:** No, no, at Mound.

4           **MR. LaBONE (by Telephone):** I know they have  
5 situations at Mound where it kind of looks  
6 like a mixture between a Type S and a Type M.  
7 It's even more soluble than M, but it doesn't  
8 look like the LANL excretion.

9           **MR. FITZGERALD:** So there would be ones that  
10 would be less, it would be, in fact, bounded  
11 by this model but none that go the other way  
12 like the Los Alamos?

13           **MS. BRACKETT (by Telephone):** We have not  
14 been able to identify any that would meet  
15 that, that would be more insoluble basically  
16 than the LANL cases. And we're still looking  
17 at the literature. We're doing an  
18 investigation of how the sources were  
19 manufactured and comparing that to, we're  
20 trying to also get more information on the Los  
21 Alamos source that was involved in the  
22 incident to show that we wouldn't encounter  
23 anything that that was insoluble at Mound.

24           **MS. BEACH:** Kathy has a question.

25           **DR. LIPSZTEIN (by Telephone):** Can I say

1 something about --

2 **MR. FITZGERALD:** Oh, yeah, I was just going  
3 to turn it over to you. I'm sorry.

4 **DR. LIPSZTEIN (by Telephone):** I think that  
5 we agree with NIOSH's white paper that the  
6 model is not the problematic issue, that it's  
7 possible to decide which is the most claimant  
8 favorable applicable model for Plutonium-238  
9 ceramic. The problematic issue I think for  
10 us, for SC&A, is how NIOSH is going to  
11 recognize exposure to this type of Plutonium-  
12 238, ceramic Plutonium-238, and how to decide  
13 when and to whom to apply the model.

14 And we had the impression by looking  
15 at the white paper that very rarely this would  
16 be applied because you say all the time, NIOSH  
17 says all the time that there isn't such cases.  
18 There wasn't seen any such cases at Mound.  
19 And our problem is that it's very, very  
20 difficult to recognize exposures to ceramic  
21 plutonium because of the different behavior.

22 What happens is that first you have a  
23 delay on the urinary excretion. And then you  
24 have an increase in the rate of the urinary  
25 excretion for a few months until you reach a

1 peak. And then it follows by a decline at the  
2 rate which could be consistent with a more  
3 moderately soluble material. This kind of  
4 behavior, which is very different from the  
5 behavior of all other radionuclides, can be  
6 confounded with chronic intakes.

7 We also at SC&A do not agree with you  
8 that it's very rare. There are several cases  
9 in the literature that describe exposure to  
10 this kind of compound that has this different  
11 kind of behavior that we call non-monotonical  
12 because there is nothing, then there's an  
13 increase, then there's a decrease. Normally,  
14 what we expect is just the decrease. We have  
15 several cases in the literature about the  
16 exposure to uranium, to ^, to plutonium and  
17 americium that have shown a similar kind of  
18 behavior.

19 Also, NIOSH says on the white paper  
20 that there were no other cases observed at Los  
21 Alamos like this one. And, again, we have  
22 published a paper in the literature from  
23 Gunther Miller, who used to be the internal  
24 dosimetry at Los Alamos, and he talked in a  
25 published paper in "Radiation Detection

1 Dosimetry" in 2002, describing an accident  
2 case that took place in Los Alamos in October  
3 1980 which showed a urinary increase pattern  
4 that could be interpreted using the Winkanine\*  
5 model or the Type J model as you call.

6 And Miller said in a personal  
7 communication, Gunther Miller said that  
8 initially there was no record of any incident  
9 in the electronic database of Los Alamos.  
10 However, after he decided to use this case in  
11 a publication, there was a search for paper  
12 incidents records. And an incident was found  
13 to have occurred in October 31, 1980. And  
14 this incident was not included in the  
15 electronic database because the indicators of  
16 the, that this was an incident way too low.  
17 So thinking again that this is very difficult  
18 to recognize.

19 And also at Mound there is a personal  
20 communication also from a former health  
21 physicist at Mound that said that he and  
22 another case that he remembers that showed  
23 exposure similar to Winknine\* cases from  
24 Plutonium-238. And there is also a  
25 publication from Wood and Sheehan in the

1           American Industrial Hygiene Association about  
2           five workers at Mound with release of  
3           Plutonium-238. And there was also this  
4           similar kind of behavior. The only thing is  
5           that at Los Alamos the peak was after two-to-  
6           three years and at Mound it was, the peak was  
7           six-to-eight months after intake.

8           Hello?

9           **MS. BEACH:** Brant's going to respond.

10          **DR. LIPSZTEIN (by Telephone):** So what we  
11          are very worried about, SC&A is very worried  
12          about is because of this very difficult  
13          pattern of excretion rate, it's very difficult  
14          to recognize that there was any incident, and  
15          you have to know there was an incident. Most  
16          of the cases to recognize this kind of intake  
17          instead of associating it with a chronic  
18          intake. And unless there is a very good  
19          database of incidents, and it could at earlier  
20          times when it was not recognized because the  
21          exposures were undetected. The MDA was very  
22          high and all that, it could be mistaken.

23          This person that, this health  
24          physicist that talked to us about the case  
25          that he remembered that had the same

1 characteristics of the Winknine\* Los Alamos  
2 accident at Mound, he said he first modeled it  
3 as a chronic intake rather than acute intake  
4 because there was an increase in the urinary  
5 concentrations for several months after it  
6 became detected.

7 So what we're saying is that I don't  
8 know if there wasn't any cases at Mound. I  
9 think we've seen that it's very possible  
10 because of the composition of the compounds  
11 that were worked at Mound that there were  
12 exposures to these kinds of compounds but just  
13 they were not recognized, and they are very  
14 difficult to recognize.

15 So what we want to know when is NIOSH  
16 going to apply any model that is derived from  
17 ^ Plutonium-238 and how it's going to be done  
18 so that to recognize that there was exposure?  
19 Because we don't think it's feasible to  
20 recognize all cases of exposure to this kind  
21 of Plutonium-238.

22 **DR. ULSH:** I'll respond to that. This is  
23 Brant Ulsh. I'll respond to a few things that  
24 you said.

25 First of all, when you started, Joyce,

1           you said that SC&A and NIOSH are in agreement  
2           that the model could be applied, the Tony  
3           James model could be applied. And based on --

4           **DR. LIPSZTEIN (by Telephone):** May I just  
5           say something? A model can be applied. I  
6           think we can study if Tony James is the most  
7           claimant favorable model. But I think a model  
8           can be applied.

9           **DR. ULSH:** Okay, well, in that case if one  
10          accepts that the criteria of an SEC issue is  
11          that doses cannot be reasonably bounded, and  
12          if we can agree that that model can be  
13          applied, this has just left the realm of an  
14          SEC issue.

15                 It is now a TBD issue that focuses on  
16          your other questions which is where and when  
17          would you apply such a model. Now, I would  
18          say that looking at 900 cases and not finding  
19          any evidence of it constitutes pretty strong  
20          evidence that it was not at Mound, but I'll  
21          let Liz and Tom address that in greater  
22          detail.

23                 You also mentioned a paper in the  
24          Journal of American Industrial Hygiene  
25          Association by Wood and Sheehan. I talked to

1 Sheehan less than a month ago when this issue,  
2 when we were debating this issue within NIOSH  
3 and asked him if he had ever seen anything  
4 like this at Los Alamos, anything like this at  
5 Mound. And he said, no, we've never seen  
6 anything like that. So I don't know. I  
7 haven't seen the paper that you referenced.  
8 If you could send that citation to us we would  
9 like to take a look at that.

10 **DR. LIPSZTEIN (by Telephone):** I will.

11 **DR. ULSH:** And not online, but also if you  
12 could send us the name of the HP that you  
13 talked to. I mean, for Privacy Act reasons we  
14 don't want to do that in open session, but if  
15 you could send us that that would be good.

16 Tom and Liz, do you want to talk about  
17 our ability or the strength of the evidence of  
18 the 900 cases at Mound, whether or not we  
19 could detect that kind of thing?

20 **MR. LaBONE (by Telephone):** The first thing  
21 I wanted to say was that, yeah, I need to see  
22 the references that Joyce is talking about  
23 because I went and looked for it. Not saying  
24 I didn't miss anything but to take a look at  
25 it, and so I'd be interested in seeing those

1 that describe LANL-type behavior in other  
2 incidents.

3 The other thing is is that we looked  
4 at as much of the published data as we could,  
5 and there was the case, I believe it was from  
6 Mound that was in Gil Metz' paper that was  
7 described as a PU ceramic, and it's similar  
8 basically to the LANL.

9 **MS. BRACKETT (by Telephone):** The paper  
10 specifically said it was similar to the  
11 material that was involved in the LANL  
12 incident.

13 **MR. LaBONE (by Telephone):** And it didn't  
14 have an excretion curve that looked anything  
15 like the Wing Nine excretion curves. I think  
16 where we're getting down to is just to hone in  
17 on what exactly, what type of material gives  
18 you this kind of excretion and where would you  
19 expect to find it in the process of making  
20 RTGs, for example. I think we need to get  
21 more details on that.

22 **MS. BRACKETT (by Telephone):** Right, but  
23 going back to what Brant said, we believe we  
24 can model it if there is evidence that it's  
25 present. We have a model and we can apply it.

1                   **MR. FITZGERALD:** Now the OTIB or the  
2 guidance piece that is being developed, is  
3 that for the upper bound fit if there is a  
4 need for an upper bound? Is that what that  
5 particular additional piece is?

6                   **DR. ULSH:** Joe, are you talking about our  
7 white paper?

8                   **MR. FITZGERALD:** No, I think at the last  
9 meeting there was some reference to additional  
10 guidance that was underway or being prepared.

11                   **DR. ULSH:** No, that was in reference to this  
12 white paper.

13                   **MR. FITZGERALD:** Oh, this is the white  
14 paper.

15                   **DR. ULSH:** Right.

16                   **MS. BRACKETT (by Telephone):** Right, I did  
17 call it an OTIB, but what ended up happening  
18 is that this is kind of the first step towards  
19 developing an OTIB is drafting this white  
20 paper. And then whatever is decided we would  
21 probably turn that into an OTIB so it would be  
22 guidance for the dose reconstructors.

23                   **MS. BEACH:** Kathy would like to make a  
24 comment or ask a question.

25                   **MS. DeMERS:** Liz and Tom, you said you used

1 the PURECON data to do the analysis of the 896  
2 individuals. Is that correct?

3 **MS. BRACKETT (by Telephone):** Well, it  
4 wasn't so much an analysis as it was just a  
5 plotting of the data, of all of the cases in  
6 PURECON.

7 **MS. DeMERS:** Okay, it is my understanding  
8 that the data prior to alpha spec was gross  
9 alpha. Is that correct?

10 **MS. BRACKETT (by Telephone):** As far as I --  
11 well, it was, there was chemistry done on it  
12 so it's basically a gross plutonium, I  
13 believe.

14 Don, maybe you remember better. Maybe  
15 there are some other things that might be  
16 present.

17 **MR. STEWART:** Yeah, gross alpha was a  
18 technique used for a number of radionuclides  
19 at Mound through about 1981.

20 **MS. DeMERS:** And in that case how did you  
21 account for the other alpha emitters that  
22 would be in the gross alpha activities, and  
23 how would that affect the metabolic clock?

24 **MS. BRACKETT (by Telephone):** Well, my  
25 understanding of the data for the most part is

1           that if the person was primarily working with  
2 plutonium, then it would have been considered  
3 a plutonium analysis. Other things --  
4 although I'd have to go back and look because  
5 I know that there was some chemistry done.  
6 But in general then we have got overestimates  
7 of what the bioassay results were. If the  
8 person was working with other nuclides as  
9 well, then we'd have an overestimate of what  
10 was there.

11                       But like I said, I would have to go  
12 back and look to see what specifically is  
13 included in the analyses because I'm certain  
14 that there was chemistry done on them.

15           **DR. MAURO (by Telephone):** Liz, this is John  
16 Mauro. I've got a real quick question for  
17 you. Is this an issue that's more related to  
18 having an incident where a person may have  
19 experienced a fairly large intake but then,  
20 let's say, shortly thereafter you see very  
21 little activity in the urine. And then, of  
22 course, later it might go higher because of  
23 this unique J function? Or is this also an  
24 issue if a person were exposed to this  
25 material under chronic conditions?

1                   **MS. BRACKETT (by Telephone):** Well, I guess  
2 it depends on what you mean is it an issue.

3                   **DR. MAURO (by Telephone):** Well, let's say,  
4 I guess what I'm hearing is that certainly if  
5 you do have this material that has this  
6 unusual clearance behavior, and you have an  
7 incident, a person is exposed, and then you  
8 monitor his urine following exposure. And  
9 let's say you don't see anything for a few  
10 months, and then all of a sudden you start to  
11 see something, I assume that that would be  
12 indicative that maybe we do have this unusual  
13 form of plutonium.

14                                 However, what I'm not hearing is  
15 whether that same problem exists if a person  
16 is just working with this unusual form of  
17 plutonium on a day-to-day basis and maybe  
18 getting some small, chronic intake. Is that  
19 something of concern here also in terms of  
20 knowing that this is occurring? And if we do  
21 know that this is occurring, does that change  
22 the way in which you would reconstruct that  
23 person's doses?

24                   **MS. BRACKETT (by Telephone):** If you look at  
25 the white paper it shows that, in fact, if you

1 compare chronic intakes of M, this material,  
2 which we're calling J and S, then J is not the  
3 claimant favorable assumption for a chronic  
4 intake for most cases. Tom did an analysis of  
5 various scenarios because it changes depending  
6 on how long the exposure is. But for many  
7 scenarios that we typically encounter it would  
8 not be claimant favorable so using M or S is  
9 more claimant favorable. So it's not as much  
10 of concern if it's truly a chronic exposure.

11 **DR. MAURO (by Telephone):** So then the  
12 subject we're really talking about is  
13 something that's more of concern, if it is of  
14 concern at all, is under some type of incident  
15 where there is a short-term exposure, perhaps  
16 relatively high levels of plutonium, but you  
17 just don't see it in the urine following the  
18 incident. That's the issue. Maybe I'm  
19 oversimplifying.

20 **MR. LaBONE (by Telephone):** I'm not that  
21 familiar with the protocols at Mound, but if  
22 you have an incident, and you know something  
23 just occurred, and if you take urine samples,  
24 fecal samples and chest counts, you would see  
25 big intakes. You would, the fecal samples

1 will work for this material.

2 **DR. LIPSZTEIN (by Telephone):** But it will  
3 be very difficult to recognize it was this  
4 material. That's the problem. It's very,  
5 very difficult to recognize it. And the  
6 problem is if you don't recognize it to whom  
7 should you apply. And also this question of  
8 the chronic intake, I think that it depends on  
9 the time of the intake and depends on the  
10 model that you use.

11 For example, the case that I have seen  
12 for Mound the peak excretion is different from  
13 the peak excretion for Los Alamos. So I don't  
14 know what is the best model to apply to Mound.  
15 What I said is that I agree there is a model.  
16 It's possible to model. I don't know which is  
17 the most conservative for which cases. The  
18 big problematic issue is how to recognize and  
19 to whom to apply.

20 And you cannot say that it's rare. We  
21 eventually will apply if it happens. How do  
22 you recognize ^ will apply if it is very  
23 difficult to have it, and if you'll know that  
24 the Mound people were exposed to this type of  
25 compound.

1           **MR. LaBONE (by Telephone):** John asked, what  
2 I heard him say was he asked about an  
3 incident. And so if I have a cam goes off,  
4 for example, and I collect a urine sample.  
5 And if I only collect urine samples, I agree  
6 with you, it may be difficult to decide if  
7 something happened. And LANL has a long  
8 history of only collecting urine samples when  
9 they do analyses just in contrast. But now,  
10 if I collect a fecal sample, I'm going to  
11 clearly know that there's a problem. If I do  
12 a chest count, if there's a big problem, I'm  
13 going to know it.

14           And so it depends upon the data you  
15 collect at the time of the incident. So if  
16 you don't collect the proper data, yeah, it's  
17 going to be tough to decide that something  
18 happened for an incident. So it depends upon  
19 the incident and what they did.

20           **DR. LIPSZTEIN (by Telephone):** Yeah, the  
21 problem is that sometimes you don't recognize  
22 there was any incident like it happened in  
23 1980 in Los Alamos. What I mean is that  
24 you'll see something on the fecal, but you  
25 won't recognize it's this kind of exposure.

1                   And the other thing is the chest measurement  
2                   of Plutonium-238, you know, it's very  
3                   difficult. It's not that it cannot be done,  
4                   but it's even now today with the very modern  
5                   techniques for lung counting it's very  
6                   difficult to measure Plutonium-238 unless  
7                   there is a huge exposure.

8                   **MR. LaBONE (by Telephone):** The people in  
9                   Wing Nine had, you know, a number of them had  
10                  positive chest counts. So if --

11                  **DR. LIPSZTEIN (by Telephone):** Yeah, yeah,  
12                  I'm not saying it's not feasible. What I'm  
13                  saying is that today, now, even today with the  
14                  modern technique it's very difficult. You  
15                  have to have a huge exposure to measure  
16                  Plutonium-238 in the lungs.

17                  So imagine at the time it was not  
18                  recognized there was an incident with this  
19                  kind of compounds, and they didn't measure it  
20                  right, and the MDAs were very high. And even  
21                  in the TBD for internal dosimetry it says that  
22                  there was a very high variability and you  
23                  cannot trust Plutonium-238 before 1994.

24                  So what is a problematic issue here is  
25                  how to recognize and to whom apply this Type J

1 or any model that is derived to be applied at  
2 Mound. I don't think this is solved yet.

3 **MR. CLAWSON:** This is Brad. Excuse me for  
4 my ignorance and stuff like that, but I have a  
5 question. And I've seen with Mound, we have  
6 tremendous different nuclides that we're  
7 looking for and everything else like that.  
8 There's a whole broad spectrum.

9 Can you do this with just a -- I see  
10 some of them that the best way is a urine  
11 sample and the other one's a bioassay. Can  
12 you do all these with just one or do you have  
13 to have a combination of them both to be able  
14 to do a representative sample? I know that a  
15 lot of times we've said, well, if these people  
16 are working with plutonium, we'd be looking at  
17 this.

18 But there's many of them that worked  
19 with everything, so are they going to have to  
20 have a combination sample to be able to do  
21 this? Because going through the O drive and  
22 stuff like that, I just see some of them as  
23 urine data, and I don't see anything of the  
24 combination or so forth. I'm just wondering  
25 how are we looking for everything that we

1 should be?

2 **MR. STEWART:** I think Liz would be a good  
3 one to answer that.

4 **MS. BRACKETT (by Telephone):** I'm not sure I  
5 understand the question because urine is  
6 bioassay. You said some people have urine,  
7 some have bioassay, but urine --

8 **MR. CLAWSON:** How about fecal? Do you need  
9 to have them both to be able to do the whole  
10 spectrum that you should be looking for or can  
11 you do it with just one?

12 **MS. BRACKETT (by Telephone):** You can do it  
13 with just urine. That's typically what you  
14 would find at most sites is just urine  
15 samples. Fecal was typically used in the  
16 event of an incident to follow up on things,  
17 and it does provide you additional  
18 information. But it's not necessary to be  
19 able to do a dose assessment.

20 **MR. CLAWSON:** So you're telling me that with  
21 a urine sample you'll be able to see all the  
22 spectrum of the things that we're working with  
23 at Mound.

24 **MS. BRACKETT (by Telephone):** I guess I'm  
25 still not clear what you're -- are you talking

1 about different radionuclides?

2 **MR. CLAWSON:** Yes. Because you know as well  
3 as I do that we had plutonium there. We had -  
4 -

5 **DR. ULSH:** Uranium.

6 **MR. CLAWSON:** -- uranium. We had tritium.  
7 We had --

8 **MS. BRACKETT (by Telephone):** Right, and  
9 there's different types of urine samples for  
10 each of those. There are specifically  
11 polonium urine samples. There were  
12 specifically uranium urine samples. The  
13 plutonium urine samples do pull out a few  
14 other things, but it does not include polonium  
15 or tritium because tritium is a beta emitter,  
16 and you need to do a different type of  
17 analysis.

18 So there's urine sampling for all of  
19 them. It's just different chemistry is done  
20 on the samples, and so you get a more specific  
21 result for the specific nuclide. So if a  
22 person were exposed to many different things,  
23 then you would need to have different types of  
24 urine samples to do the full assessment.

25 **MR. CLAWSON:** Okay, because the data I've

1           seen is they're using urine samples for one  
2           thing, but can you take like one urine sample  
3           and do multiple different checks?

4           **MS. BRACKETT (by Telephone):** Yes.

5           **MR. CLAWSON:** Or is there a quantity amount  
6           that they're getting into? Because I beg to  
7           differ because my process at Idaho is urine's  
8           very rarely used, but a fecal sample is the  
9           preferred one, and that's --

10          **MS. BRACKETT (by Telephone):** Idaho is  
11          unique in that.

12          **MR. CLAWSON:** We're very unique. It's a  
13          different story, because I just want, because  
14          I'm trying to use my site information back to  
15          what this is. And going through the O drive  
16          and stuff like that, I see a lot of urine data  
17          but not any fecal.

18          **MS. BRACKETT (by Telephone):** Fecal is much  
19          more difficult to interpret for routine  
20          samples. It's very useful for incidents, but  
21          on a routine basis it's much more variable  
22          than urine is as far as what you see from day  
23          to day and individual excretion patterns.

24                   And so it's a lot more difficult to  
25                   pin down what's going on. That's why -- and

1 workers frequently object to submitting fecal  
2 samples. It usually takes quite a PR campaign  
3 to get those done on a routine basis. So  
4 urine is what is typically used for doing  
5 assessments.

6 **MR. CLAWSON:** Okay, and that brings up  
7 another question. Have we seen at Mound when  
8 an individual is requested to do one of these  
9 samples, how are they determining what process  
10 that they would use to do this, by their work  
11 locations or? You know, and this gets back to  
12 their procedures of did they have, like this  
13 facility. I know my facility, when they have  
14 me do one, they're looking for these certain  
15 things that we work with. And I'm wondering  
16 if we have anything showing that.

17 **DR. ULSH:** Liz, I'll let you jump in in just  
18 a second.

19 But you're right, Brad, that they do  
20 base what the required urinalysis, what's  
21 required based on where they're working. For  
22 instance, if you're working in a tritium area,  
23 you're going to be required to give a tritium  
24 urinalysis. I would say that it's certainly  
25 true that different kinds of analysis are

1 required, but if you're doing, like in the  
2 early years when they did gross alpha prior to  
3 1980.

4 Let's say a person was working with  
5 both plutonium and uranium, and you see a  
6 certain amount of activity in that urine.  
7 Well, was it uranium or was it plutonium?  
8 Well, what we're going to do is take the most  
9 claimant favorable of the possible options.  
10 So if he's working with both, and he's got a,  
11 I don't know, a particular kind of cancer, if  
12 plutonium is the most favorable of the  
13 possible options, we're going to assign  
14 plutonium dose. I don't know if that kind of  
15 answers your question.

16 **MR. CLAWSON:** I guess my frustration is, and  
17 understand, I'm not a health physicist, and I  
18 respect everything because a lot of it's new  
19 to me, but in going through the O drive and so  
20 forth, especially the MESH database and so  
21 forth like that, it shows that certain people,  
22 they were checked for these things, but we had  
23 so many other nuclides that were there.

24 And I was wondering are they going to,  
25 you know, they weren't looking for claimant

1 favorable or anything else like that. How are  
2 we assured that they were monitored for what  
3 they should have because I've been going  
4 through some of the employees that we  
5 interviewed and so forth like that. They went  
6 to several of these areas but they were  
7 assigned a certain area, and that's what they  
8 were sampled for, but they were working in  
9 these other areas.

10 I'm just wondering how we take into  
11 consideration that they were doing work in  
12 these other areas. Because one of the  
13 comments that came out was I worked in this  
14 building, and this was the type sample that I  
15 was supposed to provide for them and so forth.  
16 But I also worked with this compound over in  
17 this area because it was part of our testing  
18 that we did and so forth like that.

19 And I'm just wondering how are we  
20 assured -- and I guess this may get back to QA  
21 or whatever like that -- that the people were  
22 monitored for the right substances and then do  
23 the process. Because in looking at this  
24 that'd be quite a bit of urine to be able to  
25 provide to do all these. That's why I was

1                   wondering if we have to have them both to be  
2                   able to make a good judgment of what we're  
3                   really seeing.

4                   **DR. ULSH:** I think, Brad, you're talking  
5                   about a couple of issues that we're going to  
6                   cover later in the day, I think.

7                   **MR. CLAWSON:** Okay, well maybe --

8                   **DR. ULSH:** Well, one is the roadmap document  
9                   that we've produced, and that goes through the  
10                  different processes, what radionuclides were  
11                  involved and how they were sampled.

12                  The other thing I'm guessing that you  
13                  might be thinking about is the Price-Anderson  
14                  Act violations because those were related to  
15                  that kind of an issue. So maybe we can talk  
16                  about that later in the afternoon.

17                  **MR. CLAWSON:** Okay. That sounds good. I  
18                  was just wondering if -- I know what we do a  
19                  lot of times if we have an incident. You're  
20                  correct. We submit both, but also, too, at  
21                  ours they kind of have to have both to be able  
22                  to see what we really had. And I was  
23                  wondering if this is the same thing here.

24                  **MR. STEWART:** Not so much. One of the  
25                  reasons that fecal is useful is that it gives

1           you a quick indication of what went inside a  
2           person. What a person breathed in. What  
3           makes it inaccurate is that it includes both  
4           respirable and non-respirable particles. If  
5           you inhale a large chunk of something, it's  
6           typically excreted in the feces.

7                         We're more worried from the standpoint  
8           of organ dose. What actually entered the  
9           system. If we're trying to estimate a dose to  
10          the liver, we need to know what was in the  
11          blood because the liver would only absorb  
12          plutonium from the blood. And urinalysis is  
13          our best indicator of that. And for that  
14          reason for dose reconstruction, we almost  
15          always use exclusively urine data.

16          **MR. SCHOFIELD:** Okay, I've got a question.  
17          Here's a scenario that I'm actually familiar  
18          with. There's a leak of some kind. They do  
19          either nasal swipes or facial swabs. Don't  
20          find anything. Six-to-nine months down the  
21          road when they submit this urine sample,  
22          bingo, there's a positive. If you're doing  
23          dose reconstruction, you find this in a  
24          claimant's record, are you going to backtrack  
25          to the date of their previous urine sample

1 where it was analyzed and effectually say,  
2 okay, you got this at this date and made it  
3 claimant friendly?

4 **MR. STEWART:** We use all urine data when we  
5 do a dose analysis based on urinalysis. We  
6 use all data. Typically, what we do is we  
7 overestimate the dose. If you'll look at a  
8 graph of urine dots all over the place,  
9 typically, what we do is we take the highest  
10 dot, and we make a curve, and that's how we  
11 assign the dose. It's very simple to do that.  
12 If we need to reduce that dose, we could do a  
13 more accurate estimate.

14 And we do review incident reports, and  
15 these typically include nasal swipe results.  
16 So we go back, and we can make that  
17 connection. So okay, they took some special  
18 bioassay, took a nasal swipe on June 5<sup>th</sup>, 1957,  
19 and sure enough, he's got a positive  
20 urinalysis dose here. We can go back and  
21 reconstruct that from that data point.

22 **MR. SCHOFIELD:** Okay.

23 **MS. BEACH:** Can we have a question from  
24 Kathy?

25 **MS. DeMERS:** Liz, do you remember if they

1                   actually documented the simulated lung fluid  
2                   dissolution rates at Mound, that study that  
3                   they did?

4                   **MS. BRACKETT (by Telephone):** I don't  
5                   remember.

6                   **MR. LaBONE (by Telephone):** I've never seen  
7                   it.

8                   **MS. BRACKETT (by Telephone):** I don't recall  
9                   seeing it recently. I don't remember about  
10                  the past, so I'm not sure.

11                  **MS. DeMERS:** Who would we ask about that?

12                  **MS. BRACKETT (by Telephone):** I don't know.  
13                  It would have to go through the Records people  
14                  I guess.

15                  **MS. DeMERS:** I mean as far as the process  
16                  that they went through. Is there someone that  
17                  was responsible for it?

18                  **MS. BRACKETT (by Telephone):** I don't know.  
19                  I wasn't involved in that at all.

20                  **MS. DeMERS:** Okay.

21                  **MS. BEACH:** What was it called again, Kathy?

22                  **MS. DeMERS:** Simulated lung fluid  
23                  dissolution rates.

24                  **MR. CHEW:** Do you have that ^ information,  
25                  Kathy?

1                   **MS. DeMERS:** I don't.

2                   **MR. CHEW:** You don't. You just know that it  
3 existed?

4                   **MS. DeMERS:** Yes.

5                   **MS. BEACH:** Is that something we need to ask  
6 for?

7                   **DR. ULSH:** I don't know. What's it related  
8 to? Is it related to Plutonium-238?

9                   **MS. DeMERS:** Yes, it is.

10                  **MR. STEWART:** It has to do with absorption  
11 types at Mound?

12                  **MS. DeMERS:** Yes.

13                  **MR. STEWART:** We typically assume claimant  
14 favorable absorption rates. And the TBD does  
15 have some recommendations as to the absorption  
16 rates that would apply to a given process. We  
17 typically use the most claimant favorable  
18 absorption rate.

19                  **DR. ULSH:** But if that's of interest to  
20 SC&A, you guys could include it in your  
21 keyword searches. We could just proceed that  
22 way if that's of interest to you.

23                  **MS. BRACKETT (by Telephone):** I think she's  
24 asking because of this issue with the  
25 insoluble material. That's what it would

1 relate to that we were discussing but got off  
2 track on.

3 **MR. CLAWSON:** I'm sorry. It's my fault.

4 **MS. BRACKETT (by Telephone):** Tom and I need  
5 to go, so are there any last questions that  
6 you have for us?

7 **DR. MAURO (by Telephone):** Liz, this is John  
8 Mauro. Yes, I do, real quick one for you.  
9 When you gathered the data for the 900 cases  
10 and plotted it and was looking for patterns,  
11 did you also simultaneously look for fecal  
12 analysis that would go with some of those  
13 cases? What I'm getting at is it sounds like  
14 that the pattern itself in urine may not  
15 always be that conclusive that we do or do not  
16 have this problem, from listening to Joyce.

17 But I also heard that, well, if this  
18 situation does exist where you have relatively  
19 large intake, nothing observed in the urine,  
20 but you would see it in the feces. So what  
21 I'm getting at is, it seems to me one of the  
22 most important points that are being made in  
23 this conversation is that you folks don't  
24 believe that this phenomenon really exists at  
25 Mound or did exist at Mound based on looking

1 at the pattern.

2 But then I heard that, well, sometimes  
3 the pattern could fool you. And then I heard  
4 the fecal analysis would be the telltale sign.  
5 If you saw high levels in feces and relatively  
6 low levels in urine, at least for a period of  
7 months after the initial intake, that would be  
8 an indication that you might have this  
9 phenomenon occurring. Am I characterizing  
10 this correctly?

11 **DR. ULSH:** No.

12 **DR. MAURO (by Telephone):** First of all was  
13 my question clear?

14 **DR. ULSH:** Well, yeah, your question is  
15 clear, John. This is Brant. I think there is  
16 perhaps some -- I don't know, disagreement  
17 might be too strong a word, but we're  
18 confident, I think, in the 900 cases that we  
19 looked at -- Joyce has expressed some doubt  
20 about our ability to detect it if it occurred.  
21 However, fecal sampling is a totally different  
22 subject. It's not relevant to this Plutonium-  
23 238 discussion I don't think.

24 **DR. MAURO (by Telephone):** The reason I  
25 asked it, Brant, is that what I heard is that

1 if you did inhale this material, it would pass  
2 through the GI tract and be collected in the  
3 feces. But it may not necessarily readily be  
4 found in the urine even if it was in  
5 relatively large quantities.

6 **DR. ULSH:** Well, only if it was of large  
7 particle size. That's what Don referred to  
8 earlier. It wouldn't necessarily be the case.  
9 That's not really related to whether it's high  
10 fired or not. Once it gets in the lung, at  
11 least the material at LANL, it was very  
12 insoluble so it went to the lung, and it just  
13 stayed in the lung. It's not that it came out  
14 necessarily in the feces. It just didn't go  
15 anywhere. And the question is, would that be  
16 the case at Mound as well. So it's not really  
17 related to the fecal sampling.

18 **DR. MAURO (by Telephone):** Okay, I may have  
19 misunderstood the concept. I thought that  
20 would be a telltale sign. If that's  
21 incorrect, I'll withdraw my question.

22 **DR. ULSH:** Am I right? Or, Don?

23 **MR. STEWART:** Well, a positive fecal would  
24 not itself suggest that you had the Type J  
25 exposure. It just says that you have non-

1 respirable particles.

2 **MS. BRACKETT (by Telephone):** If you catch  
3 it immediately following an incident, you  
4 would always expect to find something in the  
5 feces. That's going to be pretty sensitive  
6 the first several days following intake.

7 **DR. MAURO (by Telephone):** And that's what  
8 I'm hearing is that you may see that and not  
9 see anything in the urine, and that would be  
10 perfectly appropriate if the particle sizes  
11 were large.

12 **MR. STEWART:** Right.

13 **DR. MAURO (by Telephone):** If they were  
14 small though I'm assuming that you would see  
15 something in the urine, and if the particle  
16 size was small, and you didn't see anything in  
17 the urine, then that would start to raise some  
18 suspicion maybe we're dealing with the special  
19 form of plutonium.

20 **DR. LIPSZTEIN (by Telephone):** The problem  
21 is it's very difficult to recognize because of  
22 the special pattern. So if you don't have  
23 anything, you don't assume there was any  
24 incident. That's what happened on the 1980  
25 incident in Los Alamos. And they didn't

1 recognize even taking nasal swipes.

2 And so it could look like it was --  
3 and after as the urine excretion rate starts  
4 to increase, then starts to increase before it  
5 decreases, it could be confounded with a  
6 chronic intake when the urine excretion rate  
7 increases. And so it's just difficult to  
8 recognize it.

9 So I think the whole point is even if  
10 you have the database, unless you know there  
11 was an incident, then it would be very  
12 difficult to recognize it. And the comparison  
13 that is done with the Tony James' model with  
14 the chronic intakes for Type S and Type M  
15 depends on what the absorption rates that  
16 you're applying for the lung model.

17 So, you know, to compare it favorably  
18 or not favorably with one kind or another kind  
19 of exposure, and I don't know if Tony James'  
20 model is the best one. And the other thing is  
21 that the Tony James' model was used with a  
22 five particle size. And Miller, Gunter Miller  
23 did a model where there were different  
24 absorption parameters with the same excretion  
25 rate, but he used 0.5 for particle size.

1 I don't know which one is the correct  
2 one. If you don't measure the particle size,  
3 you don't know if it's 0.5 and five, and it  
4 makes a big difference.

5 **MS. BEACH:** I apologize for cutting this  
6 short. I know we are losing Liz and Tom, if  
7 they have not already left us. I would like  
8 to recap, however, and make sure that we  
9 capture everything that needs to be, the  
10 action items. I know we've got Joyce  
11 supplying NIOSH with a couple of documents.

12 Joyce, I don't know if your question  
13 was answered on how to recognize the model and  
14 how to apply the model. I believe that would  
15 be for NIOSH to deliver.

16 **MR. FITZGERALD:** Can I interject?

17 **MS. BEACH:** Yes, please.

18 **MR. FITZGERALD:** I think we having gotten  
19 this pretty thorough white paper and have gone  
20 through it for the past week, I think what we  
21 owe the work group is a, is to frame up this  
22 issue very clearly. I mean, we've had a lot  
23 of give and take. This is very useful. But I  
24 think what we need to do, and this would be  
25 relatively brief. This wouldn't be more than

1 a couple of weeks from now, but I think what  
2 we need to do is frame up this question of  
3 being able to identify who it would apply to  
4 and how it would be done, just lay that out  
5 very clearly with references.

6 And I also would like to provide NIOSH  
7 some case examples that might represent  
8 exceptions to the convention of the experience  
9 at Mound, this would be Mound workers we have  
10 some data for that we would provide just as  
11 illustrative examples of exceptions to this.  
12 And I think that would be the response.

13 I don't think it changes our general  
14 conclusion that a model can be applied. I  
15 think I said that up front. Conceptually, I  
16 think we're in agreement there. But whether  
17 it can be applied with sufficient accuracy I  
18 think is where we're at now. And I think  
19 these issues speak to that.

20 I would suggest we can provide the  
21 references that Joyce mentioned immediately,  
22 but I'd like to go ahead and frame this up for  
23 the work group with some of these case  
24 examples over the next couple weeks and relay  
25 that over through the work group to NIOSH to

1 support whatever final dialogue we have on  
2 this.

3 **MS. BEACH:** Great, that was actually what I  
4 was going to say but you said it much better.  
5 We do have somebody who has put us on hold, I  
6 believe. So if you have done that, please  
7 take us off hold.

8 **MR. CLAWSON:** They're on hold, so they won't  
9 hear us.

10 **MR. FITZGERALD:** The second part of that is  
11 -- maybe this was, maybe Brant can answer this  
12 -- the 896 cases that were reviewed off of  
13 PURECON, have they been, Brant, sorted in a  
14 separate file that might be available on the O  
15 drive?

16 **DR. ULSH:** Tom and Liz, are you still there?

17 **MS. BRACKETT (by Telephone):** Yeah, we're  
18 still here. I guess we have a PDF file that  
19 has the plots of all of them. It's just, you  
20 know, a quick plotting of all of the results  
21 for the people. We haven't put it on the O  
22 drive, but we can.

23 **MR. FITZGERALD:** I think that would be  
24 helpful. I know it might be repetitive, but  
25 if it's not too much, too onerous, that would



1 12:15 p.m. until 1:15 p.m.)

2 **MS. BEACH:** We are now ready to resume. We  
3 are going to continue on as the agenda states  
4 with the issue number 21.

**SUMMARY OF THE PRICE-ANDERSON ACT VIOLATIONS**

5 **MATRIX ISSUE #21**

6 And Brant, are you going to take the  
7 lead and start on this?

8 **DR. ULSH:** Yes, I'll start and quickly turn  
9 it over to Gene Potter.

10 This deals with the Price-Anderson Act  
11 violations that happened at Mound. If you all  
12 recall, when I presented our evaluation report  
13 at the Las Vegas Board meeting, that was one  
14 issue that we had reserved judgment on because  
15 we wanted to take a look at these particular  
16 violations and see whether or not they had SEC  
17 implications. That was the real question.

18 For those of you not familiar with the  
19 Price-Anderson Act and what it involves,  
20 basically, it's a broad umbrella that covers  
21 violations that occur by contractors and DOE  
22 goes in and performs enforcement actions. Not  
23 all of those, in fact, the majority of those  
24 are probably not relevant to what we do in  
25 terms of dose reconstruction.

1                   But I was not confident that that was  
2                   the case here because these Price-Anderson Act  
3                   violations dealt specifically with issues that  
4                   related to Mound's bioassay program. And so  
5                   we wanted to reserve judgment on that just  
6                   because there was a possibility that it might  
7                   be relevant to dose reconstruction and SEC.

8                   So the problem that we faced with this  
9                   issue was that there appeared to be multiple  
10                  Price-Anderson Act violations, and we were  
11                  having a hard time getting our arms around  
12                  what was what in terms of which subject each  
13                  violation dealt with. So Gene Potter has gone  
14                  through -- geez, I don't know --

15                 **MR. POTTER (by Telephone):** Nine hundred  
16                 pages.

17                 **DR. ULSH:** -- 900 pages of Price-Anderson  
18                 Act documentation and come up with a pretty  
19                 concise summary.

20                 Gene, are you out there?

21                 **MR. POTTER (by Telephone):** Yes, I am, and  
22                 it was that one reference ID that is in the  
23                 documentation that's been provided, 37-7-33,  
24                 was actually over 2,200 pages.

25                 **DR. ULSH:** Okay, so it was a lot.

1                   Gene, if you're ready, I would just  
2                   like to ask you to perhaps walk us through the  
3                   report that you've prepared. This was sent  
4                   out to the working group and to SC&A on --  
5                   well, I don't know, a couple of weeks ago.  
6                   So, Gene, go ahead.

7                   **MR. POTTER (by Telephone):** Just briefly, in  
8                   the documentation there were three enforcement  
9                   actions that you see listed in three different  
10                  sections of what you have. And I can just  
11                  read the brief description of each of those.  
12                  I don't think it's probably a good use of the  
13                  working group's time if people had a chance to  
14                  review this for me to go into a great deal of  
15                  detail. Perhaps we could spend more time on  
16                  questions if there are any.

17                  Anyway, the first violation occurred  
18                  in 1997, and that was near the start of the  
19                  Price-Anderson program which you'll recall DOE  
20                  had to publish a rule in the Federal Register  
21                  which was incorporated into the Code of  
22                  Federal Regulations, 10 CFR 835, so that a  
23                  basis would be available for taking these  
24                  enforcement actions.

25                  The first violation is as I said in

1 1997. Mound was fined \$112,500 and a number  
2 of programmatic deficiencies involving  
3 administration of Mound's bioassay program and  
4 methodologies used for determining and  
5 assigning internal dose to workers, including  
6 minimum detectable activities were not  
7 current, decision levels were not in use, and  
8 some individuals did receive bioassay as  
9 required by the RWPs.

10 And you see in the documentation  
11 there's sort of a timeline, the dates the  
12 things occurred. And then Mound was required  
13 to respond in writing to make the corrective  
14 actions for these items. And if we skip down  
15 to -- my impression at least was of what the  
16 SEC implications might have been from this  
17 first group of violations was that we can  
18 determine a superset of the workers who may  
19 have been involved in signing in on rosters  
20 that did not receive the appropriate bioassay.

21 We have documentation in MESH and  
22 other places where we can make this  
23 determination. And so this does not appear to  
24 be a SEC issue should the working group  
25 determine that the follow-up actions were

1           inadequate in some way. The MDA and the  
2           decision-level issue, again, does not appear  
3           to be an SEC issue. There were, Mound went  
4           back and made some corrections to the record.  
5           And the fact that they were comparing the  
6           results to the MDA instead of the decision  
7           level is not an issue for NIOSH dose  
8           reconstructions.

9           **DR. ULSH:** Okay, Gene, that might be a good  
10          place to stop.

11          **MS. CHANG:** This is Chia-Chia Chang, the  
12          DFO, please do not put us on hold. If you're  
13          on hold, you are obviously not hearing me.  
14          I'm going to call and ask for this line to be,  
15          the line with the beeping, to be removed. But  
16          this is a reminder to everybody to please put  
17          yourself on mute, and if you have to leave for  
18          a call, please hang up, thanks.

19          **DR. ULSH:** All right, Gene, go ahead.

20          **MR. POTTER (by Telephone):** Did we want to  
21          stop there for questions on this first  
22          violation?

23          **MS. BEACH:** Yeah, I do have a question. I'm  
24          reading on page three of 16, last sentence.  
25          It says, however, the list was not located and

1 DOE specifically requested that personnel  
2 identifiers not be used. Is that the same  
3 list you were just saying that you were able  
4 to come up with?

5 **MR. POTTER (by Telephone):** Yeah, that  
6 refers to part of the corrective actions were  
7 taken. So we don't know who specifically the  
8 76 workers were if that's the number.  
9 However, we can determine everyone who signed  
10 in on those RWPs which are named in the  
11 documentation. So we can determine a superset  
12 of who may have been affected.

13 **MS. BEACH:** Okay, so you're going to do that  
14 from the RWPs?

15 **MR. POTTER (by Telephone):** Right, from the  
16 sign-in rosters and RWPs.

17 **MS. BEACH:** Okay, thank you.

18 **MR. POTTER (by Telephone):** All right, the  
19 second violation occurred in 1998 for which  
20 Mound was fined \$165,000. And the brief  
21 description, if you want to follow along.  
22 Radiological control deficiencies during the  
23 WD-Building filter change and bioassay program  
24 deficiencies were identified. Work control  
25 problems included: work control documents did

1 not have adequate management review contrary  
2 to established procedures, an ALARA review was  
3 not conducted, a timely pre-job survey of the  
4 area was not conducted, and appropriate air  
5 monitoring equipment was not used. Bioassay  
6 deficiencies included the failure to provide  
7 timely analyses to numerous workers: namely,  
8 delays in processing Americium-241 results,  
9 delays in return of off-site vendor bioassay  
10 results, and delays in certification of vendor  
11 bioassay data. In addition, there were  
12 problems with the implementation of new alpha  
13 spectroscopy system that led to calculational  
14 errors.

15 And so here we have each of the events  
16 sort of, in the additional details section  
17 sort of dealt with individually. The WD-  
18 Building filter change was an issue where they  
19 did not have real-time air monitoring. And  
20 later they found out that they had exceeded  
21 the stop work levels and basically the issue  
22 there.

23 And the bioassay program issues  
24 revolved around replacing part of the alpha  
25 spec counting capability, and they did not

1 anticipate how long of a delay. They had to  
2 shut down some of their existing equipment,  
3 and they did not anticipate the delay, the  
4 extent of the delay, and this led to a backlog  
5 of bioassay samples which resulted in Mound  
6 exceeding their own guidelines or requirements  
7 for when results were to be determined and  
8 reported.

9 And let me see. Let me skip down to,  
10 have Mound's response. The SEC implications  
11 for the filter change were just a very limited  
12 number of workers. From the document in MESH  
13 we have we can determine exactly who those  
14 seven workers were. Follow-up bioassay  
15 samples were collected so this shouldn't be an  
16 SEC issue.

17 **MS. BEACH:** I do have one question for you.  
18 Back on page four of 16, the additional  
19 details, last sentence it says, during the  
20 pre-filter replacement, while the exhaust fans  
21 were shut down, workers consequently,  
22 personnel routinely entered the building on  
23 the 12<sup>th</sup> without wearing full face respirators.  
24 They would also not have been on an RWP. How  
25 are you going to account for them?

1           **MR. POTTER (by Telephone):** Yes, that is an  
2 issue; however, let's see, I believe I put a  
3 statement in the first paragraph under SEC  
4 implications. This has not been done to my  
5 knowledge, but the data from the workers who  
6 were monitored could possibly be used to bound  
7 the doses for any other workers who entered  
8 the building while the ventilation was shut  
9 down.

10           **MR. CLAWSON:** So would that be using a  
11 coworker data or I didn't think we had a model  
12 for that.

13           **DR. ULSH:** We don't have an external  
14 coworker data.

15           **MR. CLAWSON:** You have an internal?

16           **MS. BEACH:** I still am worried that we won't  
17 be able to identify those workers unless they  
18 knew they were in there at that certain time  
19 period and told you they were in there. So  
20 I'm not clear how you're going to address that  
21 in that aspect.

22           **MR. POTTER (by Telephone):** I don't have a  
23 response for that.

24           **DR. ULSH:** Josie, I'm reading the part that  
25 you referred to. During the pre-filter

1 replacement while exhaust fans were shut down,  
2 the building entry requirement for full face  
3 respirators was not posted. As a consequence,  
4 personnel routinely entered the building on  
5 February 12<sup>th</sup>, 1998, without wearing full face  
6 respirators as required.

7 So, Gene, are we saying here that that  
8 part of the issue is that people should have  
9 been wearing full face respirators when they  
10 went in, but they were not because it wasn't  
11 appropriately posted. But do we know, I don't  
12 see anything here that says that we don't know  
13 who went in the building. Did I miss  
14 something?

15 **MR. POTTER (by Telephone):** Right. I don't  
16 have any information to identify who may have  
17 gone into the building. But remember, this is  
18 a specific job on a specific day of rather  
19 limited duration. So there wouldn't have been  
20 a whole lot of people affected. I think  
21 you're right in that these people may have to  
22 self identify in order to take this into  
23 account. But looking at a person's typical  
24 career over several years, this is a job of  
25 duration of hours and not, probably would not

1 be significant in the overall scheme of  
2 things.

3 **MS. BEACH:** Brant is correct. There are  
4 probably two issues. If it's not posted, then  
5 the workers could inadvertently walk through  
6 without realizing that it was an en masse  
7 situation. Thank you.

8 **MR. POTTER (by Telephone):** The other thing  
9 that I guess I should add was that that  
10 statement that you read was directly out of  
11 the documentation. And DOE must have seen an  
12 issue with this because they did not force  
13 Mound to do any additional follow up, at least  
14 in the documentation that I've seen.

15 **DR. ULSH:** Gene, I think it might be  
16 worthwhile for us to take a follow up action  
17 to see if we can determine who might have been  
18 going in that building on that job.

19 **MR. FAUST (by Telephone):** Hey, Gene, it's  
20 Leo. Look at your Mound response to that  
21 particular --

22 **MS. CHANG:** Yeah, excuse me. We're having  
23 trouble hearing you. Could please get on your  
24 mouthpiece?

25 **MR. FAUST (by Telephone):** This is Leo.

1 Gene, look at your Mound response to that  
2 particular issue. It talks about five of  
3 seven workers submitted routine bioassays and  
4 the second worker was not notified until asked  
5 to sign the acknowledgement form. It looks to  
6 me like they all left bioassay samples.

7 **MR. POTTER (by Telephone):** Leo, this refers  
8 to other workers who may have not been  
9 involved in the job but entered the building  
10 while the ventilation was shut down.

11 **DR. ULSH:** Gene, I think we should take a  
12 follow up action to see if there's, if we can  
13 find any information on who might have been  
14 affected by that. I mean, the answer may be  
15 no, but we ought to look and get back to the  
16 working group on that.

17 **MR. POTTER (by Telephone):** Okay, we'll take  
18 another look at that. I'm not very hopeful.  
19 I didn't turn up anything with this initially,  
20 but there may be something we haven't turned  
21 over yet.

22 **MR. STEWART:** You possibly could look for  
23 some area monitoring results as well. We  
24 don't tend to use those to reconstruct dose,  
25 but we can use ^.

1                   **MS. BEACH:** Thank you, Gene, you can go  
2 ahead and continue if you like.

3                   **MR. POTTER (by Telephone):** The second part  
4 of that fine, the bioassay program issues were  
5 mainly delays and things which don't affect  
6 dose reconstruction; however, there were, as a  
7 part of this implementation of a new alpha  
8 spec system, some of the MDAs and decision  
9 levels were reported in error, and those were  
10 supposedly corrected. And looking in the MESH  
11 data you can see a number, there's a MESH  
12 history table that goes with the bioassay  
13 data, and you can see that there are a bunch  
14 of changes.

15                                 However, I wasn't able to determine  
16 all the people potentially affected. All I  
17 can tell you is that I can see where at this  
18 timeframe where MDAs and decision levels were  
19 changed to eliminate the problem with double  
20 subtraction background. So basically what the  
21 issue was, was that the results were not being  
22 compared to an appropriate MDA and there were  
23 changes made. And so that data should be  
24 available to NIOSH, the correct ones without  
25 the double background subtraction.

1           The last enforcement action in 2001  
2           with a fine of 137,500 comprises almost half  
3           of the documentation in that reference ID of  
4           over 2,000 pages. And there were a number of  
5           different events there. I think one of their,  
6           four of them that were specifically listed and  
7           then there were two that DOE identified but  
8           said they were not fining the site for,  
9           including one which I think will probably  
10          generate a lot of discussion, a discovery of  
11          unanalyzed bioassay samples.

12          The first issue was Building 38  
13          plutonium intake event. And this again was a  
14          specific operation that occurred January 25<sup>th</sup>  
15          of 2001 where there was a limited number of  
16          workers involved, I think only two in this  
17          case. And things went wrong and we know who  
18          those, we can tell who those guys were. So  
19          that shouldn't be an SEC issue.

20          The second one involved an issue where  
21          the site shut down uranium processing,  
22          bioassay sample processing I should say, for a  
23          short period of time, and as a result when  
24          they returned to processing they found out  
25          that some of the samples due to a query

1           deficiency, the samples were not -- excuse me,  
2           not the samples, but the reporting was not  
3           done in a timely manner. So again, this is an  
4           issue where it's a problem for an operation  
5           radiation safety program, but as long as NIOSH  
6           has the results available, it should not be an  
7           SEC issue.

8                         Then, the third item involved another  
9           issue with bioassay on radiation work permits.  
10          And as a result of an audit for this one they  
11          found that the characterization data  
12          identified additional radionuclides that were  
13          not identified to be sampled in the bioassay  
14          required by that RWP.

15                        And just want to say that this is not  
16          too unusual a situation. That in a lot of  
17          cases you will sample for the dominant or  
18          indicate a radionuclide, and then you might  
19          have a number of different means of assigning  
20          doses to the other one, should an intake occur  
21          of an indicator radionuclide. That was the  
22          issue there. They did do an extensive  
23          analysis after this and tried to determine  
24          whether this was a problem, could doses have  
25          been missed and so forth and follow up.

1                   Unreviewed safety question program  
2 deficiencies is described there. Basically,  
3 this is a safety program that does not affect  
4 dose reconstruction. In other words they were  
5 required to do audits and this sort of thing,  
6 and they inadvertently dropped a requirement  
7 from a manual. So it should have no SEC  
8 implications.

9                   And then this is the August 1st  
10 discovery of 15 unanalyzed bioassay samples.  
11 This is the one that DOE stated they were not  
12 fining the site for but included it in the  
13 documentation. And this is a kind of a long,  
14 complicated scenario that involves an earlier  
15 discovery that led to a collection of follow-  
16 up samples.

17                   Some of these samples were sent to  
18 CEP, which I think we're all pretty familiar  
19 with that story, and eventually all  
20 invalidated. And more samples were collected  
21 and ended up being sent to Quanterra as well  
22 as Argonne National Laboratory East who had  
23 been doing the samples up 'til a certain point  
24 for Mound.

25                   And as a result of this long scenario,

1           which I think you have in your documentation  
2           there, follow ups were eventually collected in  
3           all of them, but some samples were retained as  
4           back ups. And then again in 2001 the site was  
5           getting ready to dispose of some of these what  
6           they thought were back up samples, and they  
7           found 15 samples that apparently got mixed in  
8           and were not, in fact, back up samples from  
9           the earlier go rounds.

10                    So at this time I'm unable to identify  
11           who those, which employees belong to those 15  
12           samples, but they were known to Mound at the  
13           time and follow-up action should have been  
14           taken. We're still trying to pursue which  
15           workers may have been affected by those  
16           samples.

17                    I guess I kind of left out a  
18           discussion, the fact that these are Actinium-  
19           227 samples, and so we're still pursuing who  
20           those individuals might have been and haven't  
21           been able to determine from the MESH data and  
22           other sources exactly who they were and to  
23           verify that there were appropriate follow ups  
24           or the doses could be bounded or Mound did  
25           some sort of analysis to say that, well, this

1 person was not an actual worker on the 227  
2 project but may have been a manager or  
3 whatever.

4 So we're still pursuing that one.  
5 Which kind of, I'm sorry, it's a pretty short  
6 summary. I'm sure I've missed some important  
7 stuff that you want to ask questions about.

8 **MR. ALVAREZ (by Telephone):** This is Bob  
9 Alvarez. I'm sorry I missed part of your  
10 presentation. I came in maybe in the last  
11 five minutes or so, but as I understand the  
12 situation this is a problem that went back as  
13 early as 1990, prior to the start up of the R  
14 Building D&D project. Is that right?

15 **MR. POTTER (by Telephone):** Right, yes. As  
16 I mentioned, you may have missed this part,  
17 there was an early, there had been a couple of  
18 rounds of D&D. In the first one the samples  
19 were analyzed by Argonne National Laboratory  
20 apparently without any problems. The second  
21 go around Argonne decided that they didn't  
22 want to compete with commercial labs and had  
23 other priorities, so that's when the site  
24 sought other labs to do the samples.

25 **MR. ALVAREZ (by Telephone):** Now, as I

1 understand that in mid-1992 the Mound  
2 dosimetry coordinator apprised management that  
3 R building worker bioassays were unanalyzed  
4 and that management continued to ignore this  
5 information until late 1993. Is that a  
6 correct assumption?

7 **MR. POTTER (by Telephone):** I don't have  
8 enough information to determine what was in  
9 the minds of the managers. All I can say is  
10 that there were --

11 **MR. ALVAREZ (by Telephone):** Well, I mean,  
12 whether or not internal management documents,  
13 did you review internal management documents  
14 to that effect? The reason I'm asking these  
15 questions is it goes back to a pertinent  
16 question is did you review the bargaining  
17 units root cause analysis of this?

18 **MR. POTTER (by Telephone):** I reviewed all  
19 of the documentation that was in this Price-  
20 Anderson file. And with over 2,000 pages, I  
21 would have to take some time to look at what  
22 you're asking about. It would probably best  
23 be done offline.

24 **MR. ALVAREZ (by Telephone):** Okay, well,  
25 let's talk about this offline because there

1 are a bunch of details that I'm not clear  
2 about that I'd like to better understand. But  
3 I guess the bottom line question I have here  
4 is how many workers have that we understand  
5 where we may have missed their dose as a  
6 result of this situation?

7 **MR. POTTER (by Telephone):** Well, the first  
8 go around -- let me see if I've got this  
9 handy. As a result of the samples discovered  
10 earlier, in 1990 or -- I'm not looking right  
11 at the scenario or the timeline that I  
12 produced at the moment here. I seem to have  
13 it buried. In any case there were only in the  
14 neighborhood of 40 or 50 employees that were  
15 directly affected. And as a result the  
16 follow-up samples ended up being collected for  
17 close to 300 employees.

18 So it basically was thrown open to the  
19 whole site if you felt like you may have been  
20 exposed. And those samples were, in fact, I  
21 think they collected two samples from each  
22 individual. And those samples comprised the  
23 back ups that were later discovered and the  
24 scenario was that they thought that all of  
25 these samples were back ups, but it turned out

1 15 of them were not apparently back ups that  
2 were collected as a part of the follow up from  
3 the earlier events.

4 **MR. ALVAREZ (by Telephone):** So there were  
5 issues such as deficient MDA values for  
6 various radionuclides being used in MESH to  
7 flag positive results had not been updated  
8 since 1992. Is this something that has been  
9 corrected?

10 **MR. POTTER (by Telephone):** Right, yes, I  
11 covered that earlier. That was a part of the  
12 Price-Anderson findings and those were  
13 corrected in MESH. I can see in MESH where  
14 the MDA values were changed in the history  
15 table that they have.

16 The thing that I can't determine yet,  
17 but we've now got a MESH site, access to a  
18 MESH site expert who may be able to help in  
19 this regard. I can't tell who was supposed to  
20 have MDA values changed. I can only tell you  
21 that there are numerous examples where the  
22 MDAs were changed because there's a history  
23 table in MESH that tells you what the MDA was  
24 when it was inserted and then when the record  
25 was modified.

1                   **MR. ALVAREZ (by Telephone):** Thank you.

2                   **MS. BEACH:** Any other questions from the  
3 work group?

4                   (no response)

5                   **MS. DeMERS:** For the 108 individuals who did  
6 not submit bioassay samples for the 20 RWPs,  
7 do you know what radionuclides were listed on  
8 those 20 RWPs?

9                   **MR. POTTER (by Telephone):** Yes, we can  
10 determine --

11                   **MS. HOMOKI-TITUS:** I'm sorry to interrupt.  
12 I've had the operator disconnect the line  
13 that's got us on hold and beeping.

14                   **OPERATOR (by Telephone):** It will take me a  
15 moment to locate this to know which line it  
16 is.

17                   **MS. CHANG:** Thank you.

18                   **OPERATOR (by Telephone):** You're welcome.

19                   **MR. POTTER (by Telephone):** In any case, I  
20 think we do know which radionuclides are  
21 involved in those.

22                   **MS. DeMERS:** Do you know off the top of your  
23 head?

24                   (no response)

25                   **DR. ULSH:** Gene, are you still there?



1 thorium, actinium, radium and radon and so on.  
2 So they're all different.

3 **MS. DeMERS:** Are the RWPs actually in the  
4 2,000-page document?

5 **MR. POTTER (by Telephone):** The RWP numbers  
6 are, yes.

7 **MS. DeMERS:** Well, I meant the RWPs  
8 themselves.

9 **MR. POTTER (by Telephone):** No.

10 **MS. DeMERS:** Do you have those available?

11 **MR. POTTER (by Telephone):** They're in MESH,  
12 and the sign-in rosters are in MESH.

13 **MS. DeMERS:** Okay.

14 **MR. POTTER (by Telephone):** So for instance,  
15 SW-0-0-8-97 is one I looked at in detail. The  
16 workers signing in on that should have  
17 plutonium, tritium and uranium. And I found  
18 three workers had signed in, and I have the  
19 dates for, I have their last entry dates, and  
20 I have their bioassay dates for those  
21 radionuclides. So for each one of these it  
22 could be from one to hundreds of people  
23 signing in so that's why it gets to be a  
24 little complex to verify all this. So I did  
25 it for a couple of them.

1           **MS. DeMERS:** Do you know which tables in  
2 MESH this information is in?

3           **MR. POTTER (by Telephone):** Yes. Let me  
4 see. I think I've got a version here. The  
5 RWP tables all start with RWP underscore  
6 something. So there's a table RWP Master, and  
7 there's a table RWP underscore PER, underscore  
8 Roster, underscore Data. And there's a table  
9 RWP underscore Rad, R-A-D, underscore P-R-O-T,  
10 underscore R-E-Q. And I think I pulled all of  
11 that information from those three.

12          **DR. ULSH:** Can we, do you want us to e-mail  
13 it to you?

14          **MS. DeMERS:** Yes.

15          **DR. ULSH:** Gene, can you e-mail what you  
16 just said, the names of those tables, can you  
17 e-mail that to Kathy and Joe?

18          **MR. POTTER (by Telephone):** Okay. If I  
19 don't have all their addresses, I'll send a  
20 copy to you as well.

21          **DR. ULSH:** Okay.

22          **MR. CLAWSON:** These 32 employees that,  
23 individuals that were subsequently removed  
24 from the list, this says that the RWPs didn't  
25 need -- let's see, the signed in did not

1                   require bioassay samples based on workplace  
2                   indicated for the job.

3                   **DR. ULSH:** Brad, are you talking about  
4                   reducing the 108 number down to 76?

5                   **MR. CLAWSON:** Yeah, the 32 individuals, but  
6                   they were still on RWP so they must have been  
7                   around something.

8                   **MR. POTTER (by Telephone):** I kind of took  
9                   that at face value that the site had somehow  
10                  determined that bioassay was not required.

11                  **DR. ULSH:** Did DOE accept that, Gene?

12                  **MR. POTTER (by Telephone):** This is all, in  
13                  general, all documentation that went back and  
14                  forth between Mound and DOE. So I saw nothing  
15                  where DOE objected to that analysis. It's not  
16                  to say it doesn't exist, but it wasn't in the  
17                  2,000-plus pages.

18                  **MR. CLAWSON:** Part of my thing that I've got  
19                  into is, number one, I don't know how come  
20                  those 32 people if they're on an RWP, they  
21                  would have been taken off because they're  
22                  still in there. Most RWPs, you're there for a  
23                  reason. It could be radiation only or  
24                  something else like that, but that's something  
25                  that we've kind of got.

1                   But also, too, down at the bottom of  
2                   it you make a statement here that affected  
3                   workers should have provided bioassay follow  
4                   ups afterwards. Do we have anything proving  
5                   that they did or didn't?

6                   **MR. POTTER (by Telephone):** Okay, that's the  
7                   -- I was just talking to Kathy about there,  
8                   that one can go through these and determine  
9                   from those tables what radionuclides they  
10                  should have been bioassayed for, when their  
11                  last entry date was and when their next  
12                  bioassay sample for that radionuclide was.  
13                  That can be done.

14                 **MR. CLAWSON:** But we haven't done it as yet?

15                 **MR. POTTER (by Telephone):** Well, like I  
16                 say, it becomes a little onerous, but I've  
17                 done it for like the first three or so.  
18                 Because you could have hundreds of entries on  
19                 some of these.

20                 **DR. ULSH:** Just to clarify, Gene, the first  
21                 three -- you're talking about the first three  
22                 RWPs out of the 20?

23                 **MR. POTTER (by Telephone):** Right, right, or  
24                 16 or whatever the reduced, the list of all  
25                 20, the original list that we don't have. So

1 that would be kind of hard to reproduce I  
2 think. What we have is the ones that Mound  
3 determined were the actual numbers after some  
4 sort of analysis that they did. So I've got -  
5 - let me look at that again how many I have,  
6 RWP numbers.

7 I'm looking at a little bit longer  
8 document than you folks have. Oh, I have, I  
9 actually have 19 RWP numbers that are in the  
10 documentation, the Price-Anderson  
11 documentation covering the SW Building, 38  
12 Building, WD, T and 88 Buildings.

13 **MR. CLAWSON:** So you've got 19 out of 20 of  
14 them?

15 **MR. POTTER (by Telephone):** Yes, sir.  
16 Somehow I was thinking it was 16, but, no,  
17 there are 20 specifically listed in that  
18 Price-Anderson documentation.

19 **MR. CHEW:** You said in your page three it  
20 was 19, Gene.

21 **MR. POTTER (by Telephone):** And I was right.

22 **MS. DeMERS:** This is Kathy DeMers. Can you  
23 clarify something for me? Did you look at the  
24 roster of three RWPs and then compare them  
25 back for 19?

1           **MR. POTTER (by Telephone):** Say that again,  
2 please?

3           **MS. DeMERS:** Did you follow up and make sure  
4 that the individuals who signed in on three  
5 RWPs or 19 RWPs, did you follow up and make  
6 sure that they had a post-job sample? I  
7 wasn't sure whether it was three RWPs or 19.

8           **MR. POTTER (by Telephone):** Yeah, I said I  
9 only went through -- let me just double check.  
10 One, two -- I did SW-0-0-8-97, SW-0-1-0-97.  
11 And that was a long one. That had many people  
12 signing in. Okay, my apologies, it looks like  
13 I did all of SW-10-97, which is a long one and  
14 had many people signing in, but I only did the  
15 first two, not the first three.

16           **MS. DeMERS:** Okay, thanks.

17           **MR. POTTER (by Telephone):** And see, for  
18 each of these you have multiple radionuclides.  
19 In general, SW-10 was a tritium only one, so  
20 it was not too difficult to do. But say, this  
21 had over a hundred different people sign in  
22 and say that would have been one with three  
23 radionuclides on it, it gets to be rather  
24 onerous to follow all these up, but it could  
25 be done.

1           **MR. CLAWSON:** Maybe we ought to remind.

2           **MS. BEACH:** I was going to before the next  
3 discussion but now is fine too.

4           **MS. CHANG:** Just a reminder to please do not  
5 put us on hold. Please use mute unless you're  
6 speaking. And then when you're finished  
7 speaking, please mute yourself again. You  
8 could also use star six if you don't have the  
9 mute button.

10                           And this message is specifically for  
11 the person who has put us on hold multiple  
12 times today, and then you come back and you  
13 found that you've been cut off the line, and  
14 that is because your phone beeps, beep, beep,  
15 beep, and so we cut you off. So please,  
16 please, do not put us on hold.

17                           And we were interrupting the  
18 conversation to do this now because obviously  
19 we can't tell you that when you're on hold.  
20 So hopefully, you're hearing this now. Thank  
21 you.

22           **MR. FITZGERALD (by Telephone):** Gene, Joe.  
23 Some questions were raised, I guess, in that  
24 timeframe about the usability of the post-job  
25 bioassay samplings. I don't know if you

1 touched on that. Things like played out,  
2 things like maybe short half-life materials  
3 that were included. Anything that could not  
4 be adjusted for in your view?

5 **MR. POTTER (by Telephone):** The only  
6 discussion that comes to light when you  
7 mention those type of issues is the 15 samples  
8 that were discovered in August of 2000. They  
9 were thought to be backups, but in fact, they  
10 were not backups. They should have been  
11 analyzed. Those samples were so old by that  
12 time that they were never, in fact, analyzed  
13 to my knowledge.

14 And eventually, and because of legal  
15 concerns, they were not disposed of either.  
16 So they determined that technically if they  
17 analyzed them, they wouldn't know how to  
18 interpret the results because of the age  
19 possible played out or something. And so they  
20 were ultimately turned over to DOE  
21 interestingly enough. Now, I'm not sure what  
22 DOE ever did with them. But that's the only  
23 issue that I'm aware of where something like  
24 that came up in the Price-Anderson  
25 documentation. I'm not a Mound expert.

1           **MR. CLAWSON:** Well, this kind of comes back  
2 on page nine here where the radiation permits  
3 and stuff like that is what I was talking to  
4 earlier. And I think we kind of pushed it off  
5 to that area. You know, what kind of protocol  
6 do we have to make sure that, how did the site  
7 make sure that we had, that we were analyzing  
8 for what we were supposed to be analyzing in  
9 this?

10                   And I guess that's, you know, it kind  
11 of comes up to this right now. What Quality  
12 Assurance program did we have to make sure  
13 that the samples and RWP match for what they  
14 were needing. It says here that they went  
15 into a lot of them, and they found some  
16 shortcomings and so forth like that. But it  
17 comes back to that question that I have.

18           **MR. POTTER (by Telephone):** Right again, I  
19 mean, this was the exact issue in a couple of  
20 these where people did not receive the  
21 bioassay that they were supposed to. If  
22 that's the issue that, of course, those were  
23 issues were pointed up and they were dealt  
24 with through follow-up bioassay or whatever  
25 means they had at their disposal, like they

1 had looking at actual work records or  
2 whatever. That's one thing. And so these  
3 specific issues, which were problems, were  
4 discovered and were dealt with.

5 The issue on QA with the laboratory,  
6 again, you are correct that this was a problem  
7 from time to time. You see the, at least one  
8 example that is a good and a bad thing for the  
9 uranium samples were exceeding their  
10 turnaround times for reporting the results.  
11 That was actually as a result of a QA being  
12 implemented in the lab.

13 It turned out to be a bad resin which  
14 had to be replaced for determining the uranium  
15 analysis, which resulted in them missing their  
16 deadlines. But at least they were trying to  
17 do the right thing.

18 **MR. CLAWSON:** Do we know how many RWPs that  
19 they actually had at this timeframe? And the  
20 reason why I'm questioning this is because one  
21 of the comments that came out in one of the  
22 petitioners was that they were on an RWP,  
23 basically, supposedly it was supposed to be  
24 covering everything that they needed, but they  
25 went to multiple buildings, and they were just

1 staying on this one RWP.

2 And they went into different areas  
3 because what they were doing was, basically,  
4 they were doing some testing, but it took  
5 multiple areas that they delivered things and  
6 so forth like that. I'm just wondering at the  
7 accuracy of this RWP covering for all that  
8 because to me it shows that these RWPs were  
9 for a certain area.

10 **MR. POTTER (by Telephone):** Right, that  
11 issue is actually I don't think is in my write  
12 up anywhere, but it did come up. That was a  
13 part of the corrective actions. You have --  
14 for those of you who haven't worked in these  
15 programs, you have what's known as a general  
16 RWP, and then you have specific RWPs.

17 A general RWP is sometimes done for  
18 very low hazard work and would be used for  
19 visits, tours and that sort of thing. And so  
20 it keeps it from being overly onerous on  
21 keeping records. You have one RWP that would  
22 cover a multiple of the things, but they're  
23 all low hazard things.

24 And during some of these corrective  
25 actions it was pointed out that, well, this is

1 an issue, and from now on we're not going to  
2 have any general RWPs that require follow-up  
3 bioassay. So this is going to be ultra-low  
4 hazard work is the only thing that will be  
5 covered by a general RWP.

6 If you're going to have any work where  
7 a follow-up bioassay would be required, then  
8 that will be done on a specific RWP, building  
9 by building and job by job. So that exact  
10 issue that you're talking about was discovered  
11 to be a problem during these Price-Anderson  
12 follow ups.

13 **MR. CLAWSON:** So they finally came to this  
14 conclusion around 2000?

15 **MR. POTTER (by Telephone):** I hate to quote  
16 a date without looking at the documentation.

17 **MR. CLAWSON:** Well, I understand that. I'm  
18 just looking at your paperwork because that's  
19 kind of what I'm seeing that this is where  
20 they're doing this follow up and so forth like  
21 this. I guess my point kind of gets to the  
22 earlier one of how is this being taken care of  
23 earlier in these years.

24 Because it's like one of the  
25 petitioners were saying, I worked in X

1 Building. I was on this RWP. So that was  
2 having me checked for certain radionuclides,  
3 but also in the process I would travel to  
4 other buildings, but I just stayed on the same  
5 RWP.

6 And I'm just questioning to make sure  
7 that if he was covered for all radionuclides  
8 that he could, because he was going from  
9 building to building, with some of these tests  
10 and so forth that they were experimenting  
11 with. Because --

12 **MR. POTTER (by Telephone):** The only other  
13 additional information I might offer is that  
14 at these sites you always have a workplace  
15 indicator program above and beyond what  
16 bioassay may be required routinely in this  
17 case by RWP. In other words you sign in an  
18 RWP, you get a bioassay regardless of whether  
19 anything happens or not.

20 And you also have workplace indicators  
21 so if there would have been high air samples,  
22 positive nasal swabs and so forth, some sort  
23 of upset condition even though you may have  
24 been on a general RWP or whatever RWP you  
25 would have been on. It is likely that they

1 would have been followed up on. So what  
2 you're really talking about missing are very  
3 low level, chronic events which are not likely  
4 to result in much dose.

5 **MR. CLAWSON:** Well, I just, and you're  
6 right. I know that we deal with general RWPs  
7 and so forth like that, and unfortunately, in  
8 ours we've had to go away from the generals  
9 because different requirements for different  
10 bioassays and stuff. And I just, to me it's  
11 just kind of interesting to me that each one  
12 of these facilities in looking at the MESH  
13 database, they were looking for specific  
14 isotopes.

15 And I was just wondering how they were  
16 catching to make sure that those people that  
17 kind of, they were on one RWP at one building,  
18 but were going to the other ones being  
19 covered. And I don't think we can really  
20 capture that.

21 **MR. POTTER (by Telephone):** I accept that as  
22 a valid comment.

23 **MS. BEACH:** Are there any other comments?

24 SC&A, do you plan on putting together  
25 a white paper formally for this for NIOSH?

1           **MR. FITZGERALD (by Telephone):** I think what  
2 we're going to have is a point-by-point  
3 response. I think we have a couple of  
4 observations off the top. I think just based  
5 on the discussion we just had NIOSH obviously  
6 needs to verify that the individuals, the  
7 workers, on the RWP roster were sampled for  
8 the nuclides that would have been in the RWPs.  
9 I don't think there's any disagreement with  
10 that.

11                           And the after-the-fact bioassay  
12 sampling with the exception of the 15 that  
13 were discussed ought to be doable as long as  
14 the DL is available to NIOSH, the decision  
15 level. So we'll have a point-by-point  
16 response as part of the overall, you know,  
17 we'll have an overall set of responses to the  
18 NIOSH piece, the NIOSH responses.

19           **MS. BEACH:** Thank you.

20                           Kathy, did you have something?

21           **MS. DeMERS:** No.

22           **DR. ULSH:** Josie, I guess I would raise that  
23 up to the working group. In terms of looking  
24 at all, I mean, one option -- okay, it seems  
25 to me we've got a couple of choices, and it's

1 just a matter of what the working group's  
2 pleasure is. We've got, of the 19, I believe,  
3 RWPs, Gene has looked at two of them. One  
4 option would be to say that's enough. The  
5 other option would be to say, no, we've got to  
6 look at all 19, and then, of course, if  
7 there's anything in the middle.

8 **MS. DeMERS:** What year were those two RWPs?

9 **DR. ULSH:** Gene, the two RWPs that you  
10 looked at out of the 19, what years were  
11 those? Do you know?

12 **MR. POTTER (by Telephone):** I can check  
13 quickly here. Specifically, they were the  
14 ones listed in the Price-Anderson  
15 documentation were both, the ones that I  
16 looked at were both '97. The only other years  
17 affected by any of these are 1996. There are  
18 two plutonium anomalies from 1996 for 38  
19 Building.

20 **MS. DeMERS:** And they were all from '96 and  
21 '97?

22 **MS. BEACH:** Didn't you say they were from  
23 '97 but the only other year affected was '96?

24 **MR. POTTER (by Telephone):** Yes, ma'am.

25 **MS. DeMERS:** So all of those RWPs should be

1 in the MESH database.

2 **DR. ULSH:** Yes. So keep in mind that there  
3 are potentially hundreds of people  
4 potentially, I don't know, ten multiple  
5 radionuclides each. Is there some way a  
6 sampling strategy short of looking at every  
7 person, every radionuclide or is that what you  
8 want to see. I guess that's the question I  
9 would throw on the table.

10 **MR. FITZGERALD (by Telephone):** Just going  
11 back how did you choose the two that you  
12 chose, Gene?

13 **MR. POTTER (by Telephone):** They were the  
14 first two on the list.

15 **MR. FITZGERALD (by Telephone):** Okay, so  
16 just random more or less.

17 **MR. POTTER (by Telephone):** I might mention  
18 that, for example, RWP 38-0-3-4-97 there are,  
19 I don't know how many people signed in on it,  
20 but it is for it looks like three, six, nine  
21 radionuclides. So potentially that's a query  
22 for all of those for each person signing in.

23 **MS. BEACH:** Can you give me that RWP number  
24 again, please?

25 **MR. POTTER (by Telephone):** 38-0-3-4-97.

1                   **MR. FITZGERALD (by Telephone):** I guess Brad  
2 raises a good question.

3                   Josie, why don't we, I mean, this is  
4 one possibility, take it as an action and come  
5 back with a proposal on a sampling regime. It  
6 sounds like the balance would be an onerous  
7 task if, in fact, there's a lot of data  
8 points. But since we haven't actually  
9 reviewed one yet, perhaps we should do that  
10 first and then get back to the working group  
11 and NIOSH as to how we would propose to take a  
12 look at those.

13                   **MS. BEACH:** That sounds like a great  
14 suggestion.

15                   **MR. FITZGERALD (by Telephone):** I don't  
16 know. It may mean that we would have to  
17 propose a sampling regime that would be  
18 something less than the 17 that are left.

19                   **MS. BEACH:** That sounds good to me. How  
20 about the other members of the working group?

21                   **MR. CLAWSON:** That sounds fine.

22                   **MS. BEACH:** I'm hearing yeses, Joe, so --

23                   **MR. FITZGERALD (by Telephone):** And I  
24 understand, and I guess Kathy has confirmed  
25 this, everything we need to tap into is in

1 MESH, and we will have the file name. So I  
2 guess we're able to do that rather readily.

3 **DR. ULSH:** All right, we have an action item  
4 to send you the --

5 **MR. FITZGERALD (by Telephone):** Yeah, we'll  
6 get on that and the first thing is to get back  
7 with a strategy, a sampling regime, and then  
8 go from there.

9 **MS. BEACH:** And you also have the action  
10 item to the workers, the one early on, the  
11 question that I had. How many workers may  
12 have been in the buildings and the en masse.

13 **DR. ULSH:** Yes, we will look to see if  
14 there's any additional information. There may  
15 not be, but we'll at least take another look  
16 and let you know.

17 **MS. BEACH:** How are we doing? Does anybody  
18 need a break or are we good to go?

19 **MR. CLAWSON:** Ray, you're the important one.

20 **MS. BEACH:** I do think at this time we need  
21 to look at our agenda because I'm feeling like  
22 we were a little overambitious, and we're  
23 definitely not going to get all these items.  
24 So I am going to ask for comments on which  
25 ones we feel are most important today, and

1                   which ones we're going to have to come back  
2                   to. So we do have roadmap to bioassay data.  
3                   We have the Mound matrix items.

4                   **DR. ULSH:** The one that we've made the most  
5                   progress on, at least I could give you a brief  
6                   overview on it, is probably the roadmap.

7                   **MS. BEACH:** Okay.

8                   **MR. FITZGERALD (by Telephone):** Yeah, I  
9                   would suggest that if we don't reach the last  
10                  item, we're going to try to come up with a  
11                  sort of a status summary of where we stand on  
12                  each of the issues in terms of the responses  
13                  we received this past week. And certainly, we  
14                  can have that dialogue back and forth and make  
15                  you aware and make Brant and NIOSH aware of  
16                  where we think that issue stands, and how we  
17                  intend to move forward to resolve it. So if  
18                  nothing else, we'll try to get that in the  
19                  mail in the next couple of weeks.

20                  **MS. BEACH:** Okay, that sounds great. So we  
21                  will move on to roadmap to bioassay. So we  
22                  are going to take a five-minute comfort break  
23                  at this time. We will resume at 2:20.

24                  (Whereupon, a break was taken between 2:14  
25                  p.m. and 2:20 p.m.)

1           **MS. BEACH:** Okay, we are back on line.

2           **MS. CHANG:** We would like to remind people  
3 one more time to please use the mute button or  
4 star six, and please do not put us on hold.  
5 If you need to, hang up and dial back in.  
6 Thank you very much. And this message is for  
7 the one person in case you missed our previous  
8 announcement that's been putting us on hold  
9 today, and we've had to disconnect them  
10 because it's been very disrupting. Thank you.

11           **MS. BEACH:** Thank you.

12                         Brant, I'm going to let you start on  
13 this.

14           **ROADMAP TO BIOASSAY DATA**

15           **DR. ULSH:** I think it's matrix issue one I'm  
16 going to talk about. I'm more affectionately  
17 calling it the roadmap. At the last working  
18 group meeting it was requested that NIOSH put  
19 together, well, for lack of a better word, a  
20 roadmap that kind of lays out the major  
21 processes, programs that occurred at Mound.  
22 What radionuclides were involved with those  
23 programs, and then pair that to the bioassay  
24 that might have been used to detect those  
25 radionuclides.

1                   So Mel Chew is here in the room. Mel  
2                   and Don and other members of the ORAU team put  
3                   together this document. It was sent out a  
4                   little more than a week ago. It's a rather  
5                   massive document. They did quite a lot of  
6                   things at Mound over the course of its  
7                   history. I think we are up to 85 pages at the  
8                   moment and complete with color coding. So  
9                   with that I'm going to turn it over to Mel to  
10                  describe some of the general features of the  
11                  roadmap. Due to time limitations, we're going  
12                  to try to keep this fairly brief.

13                 **MR. CHEW:** Well, thank you very much. We're  
14                 not going to go down line by line. Let's talk  
15                 about what's the purpose of the roadmap. And  
16                 as Brant so correctly said, Mound was a very  
17                 complicated facility, did a lot of research  
18                 and development throughout the whole history  
19                 of it, and many different exotic isotopes and  
20                 so I'm going to let Don talk about that a  
21                 little bit more. But we'll try to combine to  
22                 give you information of what program and  
23                 processes took place, what timeframe took  
24                 place, what radionuclides were talked about.

25                   And you can see just on looking at the

1 first page, some of the quantities of the  
2 materials, those are still left fairly open in  
3 general terms. The majority of the quantity  
4 of materials are still, because of the R and D  
5 nature, are still classified information.  
6 There's a, one of the primary sources of this  
7 particular roadmap was the King document.

8 I think we have all talked about that  
9 one, which gives a lot of background  
10 information on that. Basically, left out the  
11 quantities of materials because of  
12 classification. However, we understand there  
13 is an appendix to the King document which the  
14 Albuquerque Operations office right now is  
15 trying to put their hands on it, and we'll  
16 have a chance to look at that.

17 When we do fill in the quantities,  
18 because of the classification nature here, and  
19 this follow-up document will have taken a  
20 little different form. The materials and the  
21 characteristics --

22 **UNIDENTIFIED SPEAKER (by Telephone):** Could  
23 you speak up a little bit, please?

24 **MR. CHEW:** You can't hear me. Is that you,  
25 Mike? I'm right next to the microphone. Can

1                   you hear me okay, now?

2                   **UNIDENTIFIED SPEAKER (by Telephone):** Yeah,  
3                   that's better.

4                   **MR. CHEW:** I just finished talking about we  
5                   have a column of not only the radionuclides  
6                   but the quantity of radionuclides associated  
7                   with each different process. You also can see  
8                   which locations within the particular facility  
9                   as clearly as well as we can define to talk  
10                  about what processes took place and what  
11                  quantity took place and what the material  
12                  characteristics was of that particular  
13                  material here. As I said we're not going to  
14                  go down, but there's lots of information here.

15                  I just want to assure that we did not  
16                  infringe on any classification issue. Some of  
17                  the detail process information has been taken  
18                  out of this particular document because we did  
19                  not feel that it had anything to add to the  
20                  dose reconstruction, but that information is  
21                  available.

22                  I think the key is that what is the  
23                  bioassay method so you can track along which  
24                  of the different program process radionuclides  
25                  that we would be using as far as the dose

1 reconstruction side over here. And with that  
2 I'm going to let Don talk about that because  
3 he was the primary person that assigned the  
4 bioassay method for each of the radionuclides  
5 as it related to the particular program.

6 **MR. STEWART:** Yeah, as Mel pointed out, and  
7 Brant, there were a number of different  
8 processes implemented at Mound. And what we  
9 typically we see small-scale research  
10 operation that was followed by a limited  
11 production experimentation. And in some cases  
12 that was taken to a semi-works or a full  
13 refinery methodology.

14 We saw that several times in the  
15 course of the Mound history working with  
16 different source terms, different feed  
17 material, and in some cases different bioassay  
18 methods. So a campaign would come along.  
19 They would pursue the research, go through  
20 whatever processes they were going to do, and  
21 then they would finish it up. So there were  
22 discrete periods where you were exposed to one  
23 thing and not another.

24 Typically, and we go back to Meyer on  
25 this, they would perform bioassay for that

1 campaign from start to finish. There were  
2 holes, including as we pointed out previously,  
3 in the radium-actinium program when we really  
4 didn't have a bioassay method for the first  
5 couple of years or so. A lot of the bioassay  
6 that we've paired with this is in the form of  
7 gross alpha analysis.

8 We see that we had a very large number  
9 of these bioassay methods. That is typically  
10 good for actinides. In fact, it's stated in  
11 the literature that they did all actinides  
12 with the gross alpha process. That wasn't  
13 always the case, but a lot of the  
14 radionuclides are captured in that.

15 When you get to a presumptive  
16 exposure, typically what we're faced with in  
17 the dose reconstruction process there's very  
18 little case-specific data. What we might have  
19 is a set of bioassay results and not a lot of  
20 information as to what the individual did.

21 In some cases the individual can't  
22 recall the work he performed. In some cases  
23 it's not the actual worker himself, and the  
24 interviewee had little information about what  
25 they did. So the dose reconstructor is

1 typically assuming what the exposure would be  
2 based on job title or whatever other  
3 information is available. But the presumptive  
4 exposure typically at Mound is Pu-238. That  
5 is probably what most people were exposed to,  
6 not in all cases. When we know more, we do a  
7 more detailed dose reconstruction.

8 And just the way this came about, a  
9 little bit of background here, I wanted to  
10 identify each of these major processes that  
11 sort of ebbed and flowed and then come up with  
12 a bioassay method for each one. Subsequently,  
13 we had support to go and make this more  
14 detailed, and the King document was sort of  
15 added in line by line, and the matrix was  
16 expanded to include locations as well.

17 With that I'll turn it back over to  
18 Mel.

19 **MR. CHEW:** I think a couple of key points,  
20 this is before I forget to mention, you notice  
21 there were some tritium, the word tritium  
22 compound shows up here. We deliberately did  
23 not go into any definitions of what kinds of  
24 compounds ^ in this particular document, and  
25 we're just going to leave it that way, too.

1 But there are some specific metal tritium  
2 compounds that we are aware of, and so we do  
3 have information on that. When we have a  
4 discussion later on about the tritides, we  
5 will probably talk about them.

6 I think, as I said, this is a document  
7 in progress and working. I think we have  
8 refined the program and the different  
9 processes to a high degree. There is probably  
10 a combination of documents that you can see  
11 that you can add a little bit more to  
12 different processes, but we've basically tried  
13 to keep this thing down to a minimum of so  
14 many pages here.

15 We actually eliminated many of the  
16 detailed processes but discuss the process in  
17 general. I think the key is that we need to  
18 look from left to right to look at the  
19 programs, materials and the bioassay method  
20 that has been assigned for to look at the dose  
21 reconstruction for these particular isotopes  
22 of interest here.

23 As far as exposed individuals right  
24 now, that was another addition to see if we  
25 could find information. That's probably the

1 most difficult thing to do because the King  
2 document and the reference documents didn't  
3 number them. We hope to still continue to  
4 look at more data, and either through  
5 interviews or additional documents, that we  
6 can at least bound or bracket the number of  
7 exposed individuals.

8 I think this is going to be probably  
9 the most important when we're going to be  
10 faced with some unusual exotic, and we would  
11 know that we would either try to find that  
12 there were only a few people that worked on  
13 it. And you also see a reference column here.

14 Brant, anything you want to add?

15 **DR. ULSH:** So I think the bottom line to  
16 take away from this as Mel already mentioned  
17 is that this is a work in progress, but we're  
18 pretty far along the road here. And also,  
19 when you have a nonspecific bioassay, whether  
20 that be for a particular radionuclide like  
21 uranium but not isotope-specific or whether  
22 it's a gross alpha technique for any of the  
23 actinides, we would do at Mound the same thing  
24 that we do at any other site.

25 And that is, based on the specifics of

1 the case, we would assign the most claimant  
2 favorable of the possible radionuclides that  
3 an individual was exposed to. So that's not  
4 going to be any different here at Mound.

5 And I think with that I'll just open  
6 it up for questions from whomever.

7 **MR. CLAWSON:** One of the earlier questions,  
8 and I understand from you that this is gross  
9 alpha. Is that what they were using for this?  
10 You're using a gross alpha for bioassay? The  
11 reason I'm wondering because earlier in the  
12 day there was discussion of gross alpha versus  
13 one of the other ones, and I never got an  
14 exact answer if that's the process that we  
15 were using to monitor.

16 **DR. ULSH:** You could use gross alpha for any  
17 of the alpha emitters. Obviously, you  
18 wouldn't use it for something like cesium or  
19 tritium or strontium or anything. But if it's  
20 an alpha emitter, you could do a gross alpha  
21 urinalysis for it. Does that answer you?

22 **MR. CLAWSON:** Yeah, but I just didn't  
23 understand because the two people who were on  
24 before were saying somewhat, no, we're not  
25 using gross alpha. Well, I think you brought

1 that up earlier. The process of gross alpha  
2 or --

3 **MS. DeMERS:** I guess what Brad's probably  
4 trying to say is that Liz was saying that on  
5 the phone that the radiochemistry ^ the  
6 plutonium and she kind of insinuated that it  
7 wouldn't point up the other actinides?

8 **UNIDENTIFIED SPEAKER (by Telephone):** Would  
9 you repeat that please and ask the person to  
10 step to the microphone?

11 **MS. BEACH:** Thank you.

12 **MS. DeMERS:** Earlier today we were talking  
13 about the high-fired plutonium, and Liz made a  
14 comment that the radiochemical procedure for  
15 plutonium would separate out the plutonium  
16 specifically kind of indicating that it  
17 probably wasn't selecting the other actinides.

18 **DR. ULSH:** Okay, well, let's consider what  
19 would happen in a situation like that. If a  
20 person was exposed to, I don't know, any  
21 mixture of things -- okay, if our concern is  
22 high-fired Plutonium-238 or not high fired,  
23 and you do a plutonium-specific bioassay, well  
24 then you're going to get an accurate result.  
25 In other words the activity that you see in

1 the sample will be specific for plutonium.

2 But let's say on the other hand you  
3 didn't do plutonium-specific. You did a gross  
4 alpha. Well, that could pull down plutonium.  
5 It could pull down uranium, thorium. And  
6 let's say that there was some of that in  
7 there. What would happen? Well, we would  
8 pull it all down, get a higher activity in the  
9 sample, and we would assign that to the most  
10 claimant favorable of the possible  
11 radionuclides which is usually plutonium. It  
12 depends, but usually plutonium.

13 So let's say some of the activity that  
14 we assign to plutonium is, in fact, I don't  
15 know, thorium. Well, it's claimant favorable  
16 because we treat it as if it were plutonium.

17 **MS. DeMERS:** And you looked in detail at the  
18 recoveries for the particular radiochemistry  
19 for the other radionuclides? Because I'm  
20 assuming they used a recovery ^ plutonium.

21 **UNIDENTIFIED SPEAKER (by Telephone):** Would  
22 you come to the microphone, please?

23 **MS. DeMERS:** I asked them if they looked at  
24 the recovery percentage for the other  
25 radionuclides for the gross alpha technique in

1 addition to the recovery that they got for  
2 plutonium.

3 **DR. ULSH:** For that I would have to turn to  
4 someone with more of a detailed knowledge of  
5 internal dosimetry.

6 Is that you, Don, or do we have to  
7 wait for Liz?

8 **MR. STEWART:** Yeah, I think Liz is somebody  
9 that would talk about that. But just a point  
10 on the earlier point. Tom said that he had  
11 used 896 claims. And Liz said that there was  
12 chemistry done on those. They had the option  
13 to use solvent extraction to separate the  
14 plutonium.

15 We're actually talking about 14,000 or  
16 more results for gross alpha. So I think it's  
17 certainly consistent with a smaller sample of  
18 them being analyzed for plutonium ^ . So, no,  
19 we haven't looked in detail at recovery  
20 fraction.

21 **DR. ULSH:** Well, I know there was an issue  
22 that you sometimes hear discussed about the  
23 recovery fraction for polonium being ten  
24 percent. I think there was some degree of  
25 contention about that early on in Mound's

1 history or maybe even in the '90s, but that's  
2 the only one specifically that I'm aware of  
3 that I've seen discussed, Kathy. I'm not  
4 saying that the recovery fractions on the  
5 other radionuclides are not available. I just  
6 don't have them.

7 **MR. STEWART:** The gross alpha is pretty  
8 high. I don't have it off the top of my head.

9 **MS. BEACH:** Has this been posted onto the O  
10 drive yet?

11 **DR. ULSH:** Oh, no, because it might be ^.

12 **MS. BEACH:** I understand.

13 **DR. ULSH:** We are going to submit this for  
14 security review. If we get the blessing to  
15 release it publicly, we will do that.

16 **MS. BEACH:** Also, when I was looking through  
17 this on page three, I do not know if you can  
18 answer this. It's probably pretty minor.  
19 Second column, I believe it's gray on my copy,  
20 under the helium-3 separation, at the bottom  
21 of that it says, "released to the ERS in SW  
22 Building," and I'm not familiar with the ERS  
23 term. I was wondering --

24 **MR. STEWART:** Full recovery.

25 **MS BEACH:** Full recovery. Thank you.

1           **MR. FITZGERALD:** Mel, this is Joe. I just  
2 have a quick question. You have a column  
3 called Program Process but clearly you're much  
4 broader than, I think you're identifying areas  
5 of contamination as well.

6           **MR. CHEW:** Yes, Joe. Can you tell me what  
7 you're trying to --

8           **MR. FITZGERALD:** Oh, no, no. I'm just  
9 saying that one issue that we're more  
10 sensitive to, given the NIOSH responses, I  
11 think we're focused in some areas with  
12 byproducts and contaminants of processes  
13 different than actual processes themselves.

14                   And I think your first column is  
15 encompassing both. Is that what I'm seeing in  
16 your first column there? I think there are  
17 some areas where you discuss the presence of  
18 contaminants at certain locations and  
19 byproducts as well as actual process source  
20 material.

21           **MR. CHEW:** That's correct, uh-huh. Yes.

22           **MR. SCHOFIELD:** I've got a question for you.  
23 What about when you see a lot of the other  
24 actinides in higher than normal concentrations  
25 with the plutonium, whether it's americium,

1 thorium, whatever it is? It's in above normal  
2 concentrations.

3 **MR. CHEW:** The quantity or --

4 **MR. SCHOFIELD:** Yeah, the quantity.

5 **DR. ULSH:** Well, how do we approach dose  
6 reconstruction in that case? Is that your  
7 question?

8 **MR. SCHOFIELD:** Yeah, I mean, if you're  
9 using this gross alpha, how is that going to  
10 affect their analysis?

11 **DR. ULSH:** Well, let's say that a person was  
12 exposed to plutonium because that's the most  
13 common at Mound, but also, I don't know, pick  
14 one, americium maybe or uranium, any of those  
15 three let's just say for the sake of  
16 discussion.

17 What we would do depending on which  
18 organ the cancer occurred in, we would -- we  
19 have a gross alpha result. That tells us how  
20 much activity is in the urine. We would look  
21 at the organ dose if we considered it all  
22 plutonium. We would look at the organ dose if  
23 we considered it all americium or all uranium  
24 and see which one is the most claimant  
25 favorable among those plausible choices.



1                   certainly the radon issue existed before the  
2                   venting in 1980.

3                   So the presumption is following the  
4                   closure of the cave up through 1980 there  
5                   would have been particularly elevated levels,  
6                   and then there was the venting in 1980. We'll  
7                   get to that issue, obviously a separate issue,  
8                   but in terms of your chart, is that timeframe  
9                   not reflective of that?

10                  **MR. CHEW:** I haven't caught up with you.

11                  **MR. FITZGERALD:** The timeframe for the  
12                  elevated rate -- this is on page 42. Am I  
13                  reading this right? Elevated radon levels in  
14                  SW Building timeframe begins in 1981?

15                  **MR. CHEW:** I think that the elevated levels  
16                  was stated in the, I think the reference we  
17                  used in that one was the Doug Draper interview  
18                  here. You see it, Joe?

19                  **MR. FITZGERALD:** No, no, we interviewed  
20                  Doug, and I'm understanding where he was  
21                  coming from, but in terms of the, you know,  
22                  the historic scope of the issue it was pretty  
23                  clear to him as well as the Jenkins and others  
24                  that the elevated radon levels in SW pre-dated  
25                  that sampling that Jenkins did in 1980.

1           **MR. CHEW:** Yeah, that's probably true.

2           **MR. FITZGERALD:** So I'm just saying, so  
3 there's a couple places in terms of  
4 timeframes. I realize this is a work in  
5 progress, just wanted to clarify that.

6           **MR. CHEW:** Sure, thank you, Joe.

7           **DR. ULSH:** Joe, you're absolutely right. I  
8 know that they were worried about -- and Don  
9 can fill in more on this -- you look at the  
10 periodic health physics progress reports, they  
11 were done quarterly I believe, at least for a  
12 lot of the time periods. They were looking  
13 specifically at short-lived daughter products  
14 in air. So you're absolutely right. There  
15 was concern about radon prior to '81. And  
16 we'll take a look at that particular place in  
17 the roadmap that you mentioned because I don't  
18 think we want to say that radon was only an  
19 issue from 1981 forward. I don't think that's  
20 true.

21           **MR. FITZGERALD:** Again, this is a pretty  
22 long document, and I think it's a very  
23 comprehensive piece. I think there's a couple  
24 places, you know, we'll certainly offer any  
25 comments if we have any.

1           **MS. BEACH:** Mel, I want to go back to the  
2 incident report. Can I find those incidents  
3 on the table? Is there an indicator of how to  
4 do that? I'm unable to see it.

5           **DR. ULSH:** Are you on page 84?

6           **MS. BEACH:** Yes.

7           **MR. CHEW:** Yeah, it's on 84. I'm just  
8 trying to see how you can go to the ^.

9           **MS. BEACH:** I guess I just thought since you  
10 put them in the back then there would a space  
11 in your table to find them.

12           **MR. CHEW:** I should probably ^ information  
13 or on the O drive we should put them in. I  
14 think that's your comment.

15           **MR. STEWART:** Yeah, those are quoted in the  
16 King document.

17           **MR. CHEW:** Right, let's put them in like  
18 references. Would that --

19           **MS. BEACH:** Yeah, I would -- since they were  
20 there, I thought, you know.

21           **DR. ULSH:** It makes sense. We can do that.

22           **MS. BEACH:** You should have more information  
23 then, anyway, okay, thank you.

24           **DR. ULSH:** Well, we would, but you asked  
25 earlier when we, if we were going to make this

1 publicly available. To get through security  
2 this will all have to be --

3 **MS. BEACH:** Taken out.

4 **MR. CLAWSON:** Yeah, but see, couldn't we do  
5 that as an attachment that we could have so we  
6 can address that?

7 You know, and, Mel, like usual you've  
8 done a tremendous job here. Everybody looks  
9 great. But one of my questions is is -- and I  
10 appreciate this the bioassay methods and stuff  
11 like this -- when you're stating that they  
12 were done by the process and that's what they  
13 determined what the bioassay should be for is  
14 the process that was going on --

15 **MR. CHEW:** It's probably more the  
16 radionuclide associated with the process.

17 **MR. CLAWSON:** Right, and this is what came  
18 up because this basically comes back to the  
19 D&D era that we've seen at numerous other  
20 sites of all this stuff has gone. And Mound  
21 was a famous one for this. They would build  
22 something, and then they'd go in and tear it  
23 all out and bring in something new. Was there  
24 any way that they were checking to make sure?

25 Because I think of one of the

1 instances pulling up there and ripping out one  
2 of the processes and pulling it out and all of  
3 a sudden there was no tritium and all of a  
4 sudden there was. They had uncovered it  
5 because it was underneath the metal and so  
6 forth. And I was wondering was there, I just  
7 want to make sure that people were monitored  
8 for that.

9 And this was in the later years as  
10 they were tearing it down in the D&D era and  
11 stuff like that. They had numerous, it wasn't  
12 there at the beginning, but now it is. And  
13 they were determining it as they were pulling  
14 up floors, equipment, cutting it up and  
15 tearing it out that all of a sudden they were  
16 releasing the history from a long time ago.

17 And I'm wondering if there was any,  
18 you know, that's when we're getting the RWPs  
19 because some of them mentioned that basically  
20 they weren't on an RWP because they didn't  
21 need to be because it would have been clean.  
22 But when they ripped the building, were  
23 ripping the building apart, all of a sudden  
24 they unearthed a lot of these things. I'm  
25 just wondering how we --

1           **MR. CHEW:** What you'll see in the process  
2 side, and especially relating to a specific  
3 facility which we try to mention in here,  
4 those particular radioisotopes would have been  
5 present during the operation. Your point is  
6 correct. Sometimes they said, oh, gee, we  
7 cleaned it up, and later on found all that  
8 activity.

9           And so I'm not personally aware of any  
10 -- but we can certainly look -- of any  
11 document that was just focused in on the D&D  
12 portion of it to say when we did D&D, these  
13 are the radioisotopes we encountered or we  
14 have found in the operation here.

15           Don, maybe you could help me. Have  
16 you seen a document like that?

17           **MR. STEWART:** I don't know that there's a  
18 single repository for that. It's certainly  
19 something to look at. I mean, if they had  
20 just simply assumed a production source for  
21 Actinium-227, for example, it never would have  
22 been on the RWP-97 for a 21 year half-life. I  
23 mean, it was essentially gone by the time they  
24 started to do this D&D.

25           So certainly, part of the RWP

1                    formulation process still considered what was  
2                    in there. And the King document that we keep  
3                    talking about is certainly a fund of  
4                    information here because it records what was  
5                    done in each room throughout the history of  
6                    the Mound site. So it's clear that that  
7                    knowledge was there. And certainly, if you're  
8                    going to write an RWP for a given area, you've  
9                    got to consult the history of that area.

10                  **MR. CLAWSON:** I know that we've fallen into  
11                  some lacks of that in my area of knowledge.  
12                  And to tell you the truth I wish we had some  
13                  of this for some of our buildings. Because  
14                  they're coming up with some --

15                  **MR. CHEW:** That's ^.

16                  **MR. CLAWSON:** -- actually quite good. I'm  
17                  quite enjoying it. But I know in some of the  
18                  interviews and so forth like that, they were  
19                  talking about that era and how it was here; it  
20                  wasn't here, and now it was and so forth like  
21                  that. One of the questions was we don't even  
22                  know if they were monitored for that.

23                  **DR. ULSH:** Brad, I've heard similar stories,  
24                  too, in the workers that I've talked to. It  
25                  seems that toward the D&D era they lost a lot

1 of institutional knowledge of what went on  
2 where.

3 **MR. CLAWSON:** Right.

4 **DR. ULSH:** And so that's a concern that I  
5 hear frequently expressed, too.

6 The other part of this in terms of  
7 when you add radionuclides to an RWP, sure,  
8 you're going to consult the process knowledge  
9 that you have. But the second part of it,  
10 assuming it's done correctly, would be to do  
11 pre-job characterization. If you want to do  
12 swipe sampling, maybe core sampling, and see  
13 what kind of radionuclides you encounter.

14 Now, of course, you know this better  
15 than I do, sometimes even that is going to  
16 leave you with a couple of surprises. You get  
17 into a job. You're doing something. The cams  
18 go off, and it shouldn't. Well, what you  
19 would hope that they would do would be to go  
20 in and take follow-up bioassay samples and  
21 find out what it was. Now, there's a question  
22 about whether they reliably did that, but  
23 that's what you would hope they did.

24 **MR. CHEW:** Since this is a document working  
25 in progress, we'll continue. What I think I'd

1                   like to do is to go look at several of the  
2                   RWPs used for D&D and see what's in there.  
3                   And then see if it tracks with what we have  
4                   here.

5                   **MR. CLAWSON:** This is what I was going to  
6                   ask you to do.

7                   **MR. CHEW:** We can do that.

8                   **MR. CLAWSON:** Well, I can't assign you to  
9                   do, but as a working group member, this is one  
10                  of the things that I've heard numerous times  
11                  and so forth like that. And a lot of these  
12                  processes -- and one of the things that I  
13                  heard so often was, and Mound was especially  
14                  for this, they would leave a room dormant for  
15                  years. They'd come back. They'd decon it all  
16                  down. They'd tear out some stuff. They'd  
17                  bring something else new in there and do  
18                  another process.

19                  That is not uncommon. We do that at  
20                  Idaho. We do it at a lot of different places.  
21                  But then when we fell into the D&D era, we  
22                  were bringing up stuff from 20-to-30 years ago  
23                  that all of a sudden that was not there.  
24                  Because especially breaking out the concrete,  
25                  bringing up anchor bolts and so forth like

1                   that all of a sudden it came.

2                   I just wanted to make sure that,  
3                   especially from the petitioners' part, that  
4                   the RWPs covered what we potentially could  
5                   have got into. Because in the later years I  
6                   understood that it was a somewhat of an  
7                   institutional loss and so forth like that.  
8                   That there wasn't too much follow up, and I  
9                   just want to make sure we kind of look at that  
10                  as we're looking into this.

11                 **DR. ULSH:** I think we're fortunate in that  
12                 SC&A's going to be taking a look at the RWPs  
13                 related to the Price-Anderson Act. This is  
14                 during the D&D era. One thing that we could  
15                 look at is like Mel said, we could look at the  
16                 radionuclides that were on RWPs and track it  
17                 back to here and see if --

18                 **MS. BEACH:** But my question is how many RWPs  
19                 would you do? Would you pick and --

20                 **MR. CHEW:** I don't even know how many were  
21                 done for the D&D, but I would imagine there  
22                 would be some.

23                 **MS. BEACH:** So you'll look specifically at  
24                 the D&D --

25                 **MR. CHEW:** Well, I think that's the best way

1 to do --

2 **MR. CLAWSON:** Yeah, because we get back to  
3 the general RWPs and specific RWPs. I think  
4 you'll come to find out there weren't that  
5 many RWPs for the D&D era. My understanding  
6 is that we were looking at basically maybe  
7 four or five. It was kind of building  
8 significant. I just want to make sure we  
9 follow up on those.

10 **MR. PRESLEY:** This is Bob Presley. That's  
11 what I'd like, to do it by area.

12 **MR. CHEW:** Josie, I'd like to just make a  
13 comment that as you folks see this particular  
14 roadmap, there was a considerable amount of  
15 work to put together. Several of the staff  
16 worked with NIOSH and ORAU. I'd like to just  
17 make sure I acknowledge them and people like  
18 Sam and ^ and Leo Faust and Bryce and Bob  
19 Morris. It took a lot, a whole team to put  
20 this together.

21 One more comment, Mound is very unique  
22 because they did a lot of R and D work and a  
23 lot of different isotopes. And so a roadmap  
24 like this makes a lot of very good sense. I  
25 hope I'm not setting a precedent for all the

1 other sites.

2 **MS. BEACH:** Oh, yes, you are.

3 **MR. CHEW:** -- but that has already been  
4 mentioned.

5 **MS. BEACH:** Since I wrote your name on the  
6 document.

7 **MR. CLAWSON:** Does Idaho come to mind?

8 **MR. CHEW:** It is very good to be able to  
9 take a look at one document and sort of see a  
10 picture. It gives you a very good picture all  
11 at one time.

12 Probably I'll say this to Joe, my good  
13 friend Joe, it probably begs more questions  
14 than answers, Joe, but we can certainly go  
15 with that.

16 **MR. CLAWSON:** Well, I'd like to compliment  
17 you on this because just in reading this it  
18 gives us a better idea of actually what went  
19 on. And I really commend you for it and so  
20 forth like that.

21 **MR. CHEW:** Well, it was Brant's idea and  
22 Don's, and we just picked it up and...

23 **MS. BEACH:** Okay, Joe, do you have anything  
24 else?

25 **MR. FITZGERALD:** The only thing I would

1 offer is that this is a good tool for the work  
2 group and for the dialogue we're having. So  
3 as we go through and identify information that  
4 would be relevant to this, we'll send it  
5 through the work group to NIOSH so that it  
6 might be considered as source material for  
7 the, you know, as this thing, since it's a  
8 living document so in terms of updating.

9 So we would, certainly, if we do find  
10 anything that would be location-specific,  
11 time-specific on certain nuclides, we'll pass  
12 it on to, I guess, Mel through Brant and the  
13 work group, and just keep, feed it along with  
14 everybody else.

15 **MR. CHEW:** I think, Joe, on that note we are  
16 aware of quite a bit of that, but we just  
17 decided to keep this a little bit more  
18 simplistic.

19 **MR. FITZGERALD:** Yeah, I mean, if we find  
20 anything that's particularly noteworthy that  
21 would be useful in a discussion on the issues  
22 that we have, then we'll make that known as we  
23 go.

24 **MS. BEACH:** And I believe Kathy has one more  
25 question.

1           **MS. DeMERS:** Have you guys identified any  
2 gross beta results?

3           **MR. STEWART:** No.

4           **MS. DeMERS:** Okay. Are you still looking  
5 into how you're going to look for the beta-  
6 gamma emitters?

7           **MR. STEWART:** Specifically, which beta-gamma  
8 emitters are you talking about?

9           **MS. DeMERS:** There's several examples.

10          **MR. STEWART:** Which processes?

11          **MS. BEACH:** Are you talking about page  
12 three?

13          **MR. CHEW:** I think she's talking more about  
14 the, when some of the business plugs are being  
15 processed ^ T-59 building, too.

16          **MS. DeMERS:** Yeah, there are several  
17 examples here where there's --

18          **MR. CHEW:** ^

19          **MS. DeMERS:** And you've got gross alpha that  
20 was used, and my question is, was there gross  
21 ^?

22          **MR. GIBSON (by Telephone):** I'm having a  
23 hard time hearing everyone talk.

24          **MS. BEACH:** Thanks for the reminder. If you  
25 could please speak into the microphones.

1 Did you hear Kathy's question?

2 **MR. GIBSON (by Telephone):** I didn't hear  
3 the question or the response.

4 **MS. DeMERS:** I asked if there was gross data  
5 urinalysis to evaluate the beta-gamma emitters  
6 at Mound.

7 **DR. ULSH:** And the reply was no gross beta.

8 **MR. STEWART:** Yeah, throughout history there  
9 was no gross beta.

10 **DR. ULSH:** What about specific, more  
11 specific like strontium or --

12 I think, Kathy, again, I would need to  
13 look at the specific situation, but when you  
14 see gross beta it could be -- sorry, gross  
15 alpha -- it could be an indicator that we  
16 would be looking for the indicator species,  
17 the dominant radionuclide as opposed to the  
18 very minor beta contaminant.

19 **MR. STEWART:** Again, Kathy, a lot of these  
20 in this third or fourth column over come  
21 directly from the King document. And not that  
22 it's always one hundred percent accurate, but  
23 King definitely says the primary radionuclide  
24 was Pu-238 with other exposures to these  
25 others here. So one thing that wasn't

1 considered in the former part of the TBD was  
2 the proportionate dose from these minor  
3 constituents of the source term. And as we  
4 say throughout here, the primary exposure is  
5 Pu-238 in most cases.

6 **MS. DeMERS:** Can you clarify that under your  
7 bioassay method when you're going to assume  
8 that beta doesn't make up a significant  
9 portion of the dose?

10 **DR. ULSH:** We'll take a look.

11 **MR. CHEW:** And if it's process-specific,  
12 Kathy, that would be a good point.

13 **MS. BEACH:** Any other comments?

14 **MR. CLAWSON:** I've got one question. In  
15 coming through this and reading through the  
16 documents and so forth like that, I keep  
17 hearing the terminology of the hot cells at  
18 Mound. I have not been able to find an actual  
19 hot cell at Mound yet. The New Cave? What  
20 about the Old Cave? Do we have any drawings  
21 or anything of that?

22 **MS. BEACH:** And that's funny because in my  
23 notes I asked for you to define what the hot  
24 cell was, what type of material it was made up  
25 of so I had that same question.

1           **MR. CLAWSON:** Because one of the things came  
2 down to the ventilation systems and so forth.  
3 I know that we had some earlier ones and then  
4 the Mound interviews and so forth like that  
5 the comment was, well, they called it a hot  
6 cell or it was basically a room. Now, later  
7 on they said when they built the new one, but  
8 it's not what I consider a hot cell. And I  
9 was just trying to get a mental picture of  
10 what we were talking. Is there any kind of  
11 drawings or anything that would show us any  
12 kind of ventilation or how it was set up?

13                   Because numerous times we hear  
14 referring to the hot cell, so forth, and some  
15 incidences and so forth like that. And I'm  
16 just having a hard time picturing what it  
17 actually looked like. Now, when we went to  
18 the museum and so forth like that they were  
19 going to try to locate some pictures and so  
20 forth and some of the stuff. But I haven't  
21 had the opportunity --

22           **MR. CHEW:** I'm familiar with many of the hot  
23 cells ^. We also would call hot cells that  
24 would be a shielded glovebox using a  
25 manipulator, too. But I don't know that for a

1 fact.

2 **DR. ULSH:** The room that you talked about, I  
3 have seen pictures, and it is several feet of  
4 shielding or several inches of shielding with  
5 the remote manipulators. So that is the  
6 picture you had in your head of a hot cell?  
7 That's what it is.

8 **MR. CLAWSON:** Mine are five-and-a-half foot  
9 thick.

10 **MR. CHEW:** Yeah, I know, but these are  
11 shielded gloveboxes possibly. I don't know  
12 that for a fact.

13 **MR. CLAWSON:** Because I see the terminology  
14 going back and forth like that, and what I was  
15 looking at was, okay, how are we set up in the  
16 ventilation because I know that we made a,  
17 because they referred to caves back and forth,  
18 but they also called the same thing was a hot  
19 cell, and I was just trying to get a picture  
20 of what we had because we had the radon issue  
21 that came up and so forth. If we had any kind  
22 of drawings of that, especially the  
23 ventilation process because this was one of  
24 the add-ons versus so forth. And then when we  
25 had the crack and so forth like that. If we

1           have any kind of prints or anything that's  
2           showing what that really was like because I  
3           was trying to understand what they were  
4           talking about like this. And when they did  
5           talk about it I couldn't see how that could go  
6           on like that and what I saw as a hot cell.

7           **DR. ULSH:** They had two cave facilities, the  
8           Old Cave and that's where they did the radium-  
9           actinium-thorium separations, very messy,  
10          contamination spilled all over the place.  
11          That's why we went SEC on that. They  
12          decontaminated that in 1959, ending 1959. And  
13          then they built the New Cave facility which  
14          included a hot cell.

15          **MR. CLAWSON:** Now, is that a glovebox or --

16          **DR. ULSH:** No, I don't think so. This is a  
17          big -- I don't know the dimensions, but it's a  
18          long bay with remote manipulators and several  
19          inches of shielding. I've got pictures that  
20          were provided to me by the museum, but I can't  
21          remember if it's the Old Cave or the New Cave,  
22          but I'll take a look.

23          **MS. BEACH:** This says on page three of the  
24          matrix, third paragraph, fourth paragraph,  
25          that was one of my questions, too. That took

1 place in 1964; however, this operation in  
2 contrast to the operations with similar  
3 materials in the '50s, was performed inside  
4 the hot cell in the New Cave. They completely  
5 isolated the material from the outside  
6 environment, but there was quite a bit of  
7 bioassays that were not done and they were  
8 depending upon the New Cave. And on this  
9 page, and then again for 1-B you guys  
10 reference the hot cell and that no bioassay  
11 was done because of the hot cell. So those  
12 are the things I was looking at also.

13 **DR. ULSH:** Well, I'm not necessarily saying  
14 that there was no bioassay -- maybe I was. I  
15 don't know. I would have to look  
16 specifically, Josie, at the 1964 actinium  
17 project. I know that I've talked to the guy  
18 who was in charge of that, the project  
19 manager, and he told me specifically that it  
20 was done in the hot cell. He told me that it  
21 was a successful operation. They opened up a  
22 couple of capsules, maybe there was more than  
23 one. The first one that they opened up they  
24 had some contamination inside the hot cell,  
25 but he said it never escaped the hot cell.

1 The second one, and maybe the third one if  
2 there was a third one, they didn't have those  
3 kinds of issues, but it was --

4 **MS. BEACH:** But from my work history, I  
5 worked in gloveboxes for Pu at Dash Five at  
6 Hanford, and we were still on a bioassay  
7 program even though all our work was performed  
8 inside a glovebox. So I don't know if it's  
9 the glovebox, a hot cell.

10 **DR. ULSH:** No, I think it's a hot cell. I  
11 can't tell you whether or not the people who  
12 were involved in that '64 project did or did  
13 not have bioassay.

14 **MS. BEACH:** On page four it says bioassay  
15 not taken for Thorium-230 not because Mound  
16 lacked the capability, but because there was  
17 no perceived need. And what I got from that  
18 was because they didn't perceive a need  
19 because they were in the hot cell.

20 **DR. ULSH:** Okay.

21 **MS. BEACH:** Unless I'm reading that  
22 incorrectly.

23 **DR. ULSH:** A little bit, I might have  
24 written it incorrectly. Thorium-230 would not  
25 be the radionuclide that you would sample for

1 Cotter concentrate. It was several thousand  
2 dpm of uranium, and you would use that as the  
3 indicator species. So you wouldn't need to  
4 sample for Thorium-230.

5 **MS. BEACH:** That's all a part of that  
6 question, and the way it's in that paragraph I  
7 tend to believe that that's why --

8 **DR. ULSH:** I could see where you could get  
9 that impression. I should probably reword  
10 that.

11 **MR. CHEW:** Brant, if you look at your page  
12 24 in the roadmap ^ in the 1940-1953  
13 timeframe.

14 **MR. FITZGERALD:** Brant, is that interview  
15 with the project director, is that available  
16 anywhere?

17 **DR. ULSH:** Yes, I believe it is. I believe  
18 that it's in the SRDB, but I would have to  
19 give you the number, Joe.

20 **MR. FITZGERALD:** Okay, fine.

21 **MS. BEACH:** And who is that project  
22 director? Do you know?

23 **DR. ULSH:** Yeah, I know. We just can't say  
24 the --

25 **MS. BEACH:** Oh, you just can't say. Thank

1           you, sorry.

2           **DR. ULSH:** I'll tell you offline, but, boy,  
3           good test.

4           **MS. BEACH:** So, Joe, on this one I'm getting  
5           you will be sending your questions on the  
6           roadmap or comments to NIOSH.

7           **MR. FITZGERALD:** You know, as we go, I think  
8           the point's been made that this is a living  
9           document that's going to be added to and  
10          corrected and that kind of thing. If we have  
11          those kinds of things, we'll send them through  
12          the work group to NIOSH for consideration.  
13          But we understand the level of detail as well  
14          as Mel points out, so we'll try to keep it  
15          pretty much in this level.

16          **MS. BEACH:** Okay, and then NIOSH is going to  
17          look at RWPs and see how they track with the  
18          roadmap. So that's an action.

19          **MR. CLAWSON:** Also, the D&D era.

20          **MS. BEACH:** Roadmap for the RWPs for the D&D  
21          era. Any other action items?

22          **MS. DeMERS:** I have a request.

23          **MS. BEACH:** Kathy has one.

24          **MS. DeMERS:** SC&A, when you get a hold of  
25          the Appendix E, I'd like to see it.

1           **DR. ULSH:** Okay, I'll let you know when  
2 we've definitively located that.

3           **MR. CLAWSON:** And I don't care who does it,  
4 I'd sure like to try to find something,  
5 because, you know, I guess part of my problem  
6 is they're reverting back. I've heard  
7 glovebox referred to as hot cells or whatever  
8 like that. I don't have a problem with that.  
9 I'm just trying to draw a mental picture  
10 versus the Old Cave versus the New Cave and  
11 what, in my interviews, what was discussed in  
12 that.

13           **MR. CHEW:** Josie, you can put an action item  
14 and we will look at it.

15           **MR. CLAWSON:** I'd appreciate it.

16           **MR. PRESLEY:** There's a website that is  
17 entitled -- this is Bob Presley by the way.  
18 It's on here and it states that the Old Cave  
19 was an A and L design. It's got the  
20 dimensions, any windows --

21           **MS. BEACH:** Can you e-mail that?

22           **MR. PRESLEY:** -- I can give you the website.

23           **MS. BEACH:** E-mail the link. That would be  
24 great.

25           **MR. PRESLEY:** It's a good site. There's

1           some pictures of another one, showing some of  
2           the stuff on here.

3           **MR. CLAWSON:** Well, I want to make sure that  
4           we're up to that because some of the questions  
5           came up on the ventilation and so forth and  
6           how we got into the radon issue. And I know  
7           we're not discussing that, but that's just  
8           kind of feeds along with it of how everything  
9           was set up and so forth like that. So if you  
10          can find anything, I'd appreciate it.

11          **NIOSH RESPONSES TO MOUND MATRIX ITEMS**

12          **MS. BEACH:** Okay, in the next 20 minutes  
13          what I'd like to see us do, we did not get  
14          into the Mound matrix items. Joe did promise  
15          to send the status of that. I don't know who  
16          wants to go first or where they'd like to go  
17          for --

18          **MR. FITZGERALD:** Can I jump in?

19          **MS. BEACH:** Yes.

20          **MR. FITZGERALD:** There's several that I  
21          think would be useful to get a, sort of a  
22          status on, issue two on radon. I think I  
23          understand what NIOSH is indicating in that  
24          one in terms of the data points that have been  
25          found for radon associated I guess with the

1 D&D that took place in the Old Cave. And I  
2 guess my question is I know you're going  
3 through that data, and certainly the proposal  
4 of that could represent an upper bound for SW  
5 and R in terms of exposure. Is that data  
6 going to be available or an analysis of that  
7 data going to be available soon?

8 **MR. STEWART:** Currently, the data is, the  
9 data are available. An analysis is not yet  
10 available. When we get that done, we will  
11 share it. And that is exactly the point, to  
12 create a bounding dose estimate of radon for R  
13 and SW using these data from the '50s which  
14 will, I feel quite confident, overestimate  
15 dose to individuals later.

16 **MR. FITZGERALD:** Now you indicate including  
17 even some short-lived species. Is that  
18 referring to perhaps the fluoron or acnon?

19 **MR. STEWART:** Yeah, we're going to take a  
20 look at what the exact constituents of this  
21 are. Just a kind of historical note. It's  
22 very obvious when we went back and looked at  
23 these health physics reports that the Old Cave  
24 was a big problem. They had several plans to  
25 decontaminate it and re-use it.

1                   And, in fact, when they concluded the  
2 radium-actinium program, the plan was to decon  
3 it, leave it for awhile and then modify it for  
4 further uses down the road. But they saw that  
5 they had a short-lived alpha problem resulting  
6 from the cave that resulted in them completely  
7 decommissioning it which did not eliminate  
8 their radon problems.

9                   They still had high radon  
10 concentrations as we saw in the results from  
11 the 1980s. And for that reason we will create  
12 a bounding dose estimate for that intervening  
13 time period that we don't have data for. And  
14 this will affect the very small number of lung  
15 cancer claims that are currently not  
16 compensated at this point.

17                   **MR. FITZGERALD:** Is it possible -- and this  
18 is sort of related to a question to identify  
19 the worker population that was exposed, or is  
20 it just assuming certain rooms within those  
21 two buildings?

22                   **MR. STEWART:** Well, I'm not sure how we will  
23 approach, but it is problematic to identify  
24 workers who never went into R or SW. Again, I  
25 think we're talking about fewer than ten

1 cases. And I suppose we could say whether  
2 they were non-radiological workers or not, but  
3 I don't know that we'll define it any more  
4 specifically than that.

5 **DR. ULSH:** Joe, in the meantime if you want  
6 to get kind of a preview, I'd refer you to the  
7 health physics progress reports that are  
8 available on the SRDB.

9 **MR. FITZGERALD:** Yeah, I saw the reference.

10 **DR. ULSH:** They have a periodic, I'm sorry,  
11 a recurring table in there that gives the air  
12 monitoring data for short-lived daughter  
13 products.

14 **MR. FITZGERALD:** Okay. I think the approach  
15 is founded. I look forward to seeing the  
16 details.

17 I'm going to jump around a little bit.  
18 I'm not sure how much time we're going to end  
19 up having. We can maybe backfill as we go. I  
20 just wanted to revisit issue five, something  
21 we raised in terms of Pu-240 and -241. And I  
22 think we've converged on agreement that this  
23 involves more of a question of the relative  
24 concentration of the isotopes, but that would  
25 certainly be more of a site profile issue. So

1 we would recommend that one as an SEC issue be  
2 closed.

3 **MS. BEACH:** Okay, is everybody in agreement  
4 with that?

5 (no response)

6 **MS. BEACH:** So at this time issue number  
7 five is now closed as an SEC issue. It is now  
8 under the heading of a site profile issue.

9 Thank you, Joe.

10 **MR. CLAWSON:** This is Brad. While we're on  
11 Health Physics 101, I'd just, we've kept  
12 talking -- and excuse my ignorance on this,  
13 but I'm just trying to figure this because  
14 when we do a bioassay, and we're looking for  
15 gross alpha, that would show what it was at  
16 that time. You know, he could have got two  
17 months before and it's decaying down to this.  
18 How do we bound, you know, I'm trying to  
19 figure how you guys do this because you know  
20 what it is there, but --

21 **DR. ULSH:** This is a recognized problem that  
22 you pull a sample, a urinalysis sample at a  
23 particular point in time. You're not always  
24 able to tie that to a particular incident or a  
25 particular intake. And I always mess this up

1 so I'm going to leave it to Don to fill in the  
2 details. But it has to do with going back in  
3 history and when was the last bioassay result  
4 taken.

5 Don, fill that in, will you?

6 **MR. STEWART:** It depends on the amount of  
7 data available on the claim, and in general,  
8 the more data that are available the more  
9 accurate the dose reconstruction would be.  
10 Our typical problem is to correlate a  
11 presumptive exposure with a negative result  
12 since very many people are tested for intakes  
13 for excretions of radionuclides and don't have  
14 a result above a minimum detectable amount.  
15 So that's our biggest problem. But we will  
16 relate that, we can go back and do that and I  
17 always attempt to go through all of this and  
18 start it out.

19 **MR. CLAWSON:** I'm sure you guys on the phone  
20 will enjoy this. I hope that you can bear  
21 with me though.

22 **MR. STEWART:** So for a given individual, we  
23 might have dose results from '49 to '65 and  
24 have data points all over the place. So we  
25 have to make some assumptions about when he

1 had an intake and what that intake might have  
2 been. We don't always go to all that trouble,  
3 frankly. We say, okay, this guy started in  
4 '49, ended '67. Let's just make it easy on  
5 ourselves. Fit the highest point and that's  
6 his intake. So that's how we'll characterize  
7 that one. That one was easy. And typically  
8 an overestimate is easy. If the guy is going  
9 to ^ based on a simple result, you're going to  
10 plot that first point --

11 **UNIDENTIFIED SPEAKER (by Telephone):** Hello?

12 **MR. CLAWSON:** Hello.

13 **MS. BEACH:** We're still here. Don's  
14 drawing. Hang on.

15 **DR. MAURO (by Telephone):** Joe, can you hear  
16 me?

17 **MR. FITZGERALD (by Telephone):** I can hear  
18 you.

19 **DR. MAURO (by Telephone):** I can't hear the  
20 group any longer.

21 **MR. ELLIOTT (by Telephone):** Hi, this is  
22 Larry Elliott. I believe we've lost the  
23 conference room at the hotel.

24 **MS. BEACH:** We can still hear you. We had a  
25 paper over it, sorry.

1           **MR. CLAWSON:** You know how Ray gets. He put  
2 a paper on his own mike.

3           **DR. ULSH:** While we were off we settled all  
4 the issues.

5           **MR. STEWART:** I was talking about how we  
6 would fit a bioassay data to a given intake.  
7 And the point I was trying to make in my  
8 roundabout way is that we typically do it one  
9 of two very easy ways. In a case where we can  
10 assign a lot of dose to the organ and not make  
11 the claim compensable, we will overestimate  
12 the dose by picking one of the higher points  
13 or picking a dose excretion curve that's not  
14 credible and results in a large dose but does  
15 not make the case compensable.

16                   Conversely, if we have a simple  
17 compensable case, say it's a lung cancer and a  
18 person worked with Plutonium-238, we could  
19 often pick one or two data points, neglect the  
20 rest and you can see that this clearly, this  
21 curve, clearly moves under the data. We are  
22 underestimating dose, and that's a compensable  
23 case. So to answer your question, we don't  
24 often do it in a lot of detail.

25                   However, sometimes we are required to

1 do that. We'll go back, and we'll look  
2 because some claims that are kind of around  
3 the compensation region so we have to  
4 accurately estimate the dose. And we can do  
5 that if we have sufficient data.

6 **MR. CLAWSON:** If you use the high curve that  
7 you're talking about there, do you have to  
8 have two or three more data points to be able  
9 to get at that? Because my one point is, is  
10 like the one that you have circled there. Say  
11 that was six months down the road, this point  
12 in time he had this much. That's what he's  
13 going to get. But actually, if you went back  
14 it would have been higher.

15 **DR. ULSH:** That's exactly what we do though.  
16 We go back to the previous bioassay result.

17 **MR. CLAWSON:** So the previous bioassay.

18 **MR. STEWART:** Whatever it is.

19 **DR. ULSH:** So let's look at a different  
20 case, Brad, where you've got a point out here  
21 that's a positive result.

22 **MR. CLAWSON:** All right.

23 **DR. ULSH:** Well, when did that happen? It  
24 could have been the day before. It could have  
25 been the day after his last bioassay result.

1 We don't know. It could be anywhere in there.  
2 So what we're going to do --

3 **MR. CLAWSON:** Okay, that's what I was trying  
4 to understand.

5 **DR. ULSH:** Did I say anything wrong?

6 **MR. STEWART:** Well, if we have a presumptive  
7 intake which occurred somewhere in this point  
8 in time, we typically assume that it's halfway  
9 in between and that being the most logical  
10 approach given our approach for external dose  
11 which is to assign limited detection to.

12 **DR. ULSH:** I think that's right. That's  
13 also what ICRP recommends, right?

14 **MR. STEWART:** Yes, that's an ICRP  
15 recommendation. So that's what we do.

16 We don't have to do that a lot. A lot  
17 of times we'll have case-specific data. When  
18 we do it's kind of a big deal to go back and  
19 look at it and make sure it's not overly  
20 claimant favorable and certainly does not  
21 underestimate the dose.

22 **MS. BEACH:** Now I have a quick question.  
23 Once we close this and it becomes a site  
24 profile issue, what happens to it? Do you do  
25 something to change the site profile or, and

1 will we hear about that?

2 **MR. CLAWSON:** This kind of falls into the  
3 realm of I know that the site profile is a  
4 living document, but how to us in the work  
5 group do we keep up with the site profile and  
6 changes?

7 **DR. ULSH:** I think that's a question for  
8 Chia-Chia. We are going to be revising the  
9 TBD as an outcome of the SEC process. There's  
10 going to be a lot of issues here that, you  
11 know, who know how this is going to turn out,  
12 so we are planning to do that. Now, in terms  
13 of once the SEC part of this process is closed  
14 out, however it turns out, well, then we move  
15 into revising the TBD. And I --

16 **MS. CHANG:** I don't know. There's not a  
17 work group on the Mound site profile, and is  
18 there a work group on site profiles in  
19 general?

20 **MR. CLAWSON:** No, this is not just unique to  
21 the Mound work group. As we go into the SEC  
22 petitions and so forth like that a lot of  
23 times the TBDs do change. I guess my thing is  
24 is how are we going to be able to track these  
25 because we don't want to lose them. We want

1 to be able to see how they change.

2 **MS. BEACH:** See, I don't want to drop it and  
3 then never hear about it again. That's why  
4 I'm asking.

5 **DR. ULSH:** I can tell you internally this  
6 document that I've put together here, NIOSH  
7 Responses to Non-Matrix Items, I've got Issue  
8 Status. And let's say we close number five as  
9 an SEC issue, I would add a status on there  
10 saying SEC closed, TBD opened, or something  
11 like that.

12 **MR. FITZGERALD (by Telephone):** And Josie,  
13 I'm sure Larry can also confirm that the Board  
14 has this as a generic issue in terms of how to  
15 handle site profile closures as well as issues  
16 coming in from SECs. And we have the same  
17 issue for Y-12 and some other sites. And that  
18 discussion's been ongoing.

19 **MS. BEACH:** Okay.

20 **DR. MAURO (by Telephone):** So, Josie, this  
21 is John. By way of precedent in the past I  
22 could say for Hanford and for the Nevada Test  
23 Site what happened in those cases was almost  
24 perhaps the reverse of what we're talking  
25 about now. In those cases a site profile

1 group was formed, working group, was formed  
2 and then when the SEC issue, SEC was issued  
3 and that process began.

4 What happened was the Board voted on  
5 this and merged the two basically saying,  
6 okay, Hanford, your mandate now is not only  
7 the site profile, but it is also the SEC  
8 petition. So that the two were really under  
9 the same umbrella. And what has been  
10 happening is the SEC issues usually take front  
11 and center, and we allow the issues to fall  
12 into, just as we're doing now, into the site  
13 profile when that emerges from the process.

14 But the good thing is from the others  
15 is that there is a place to catch them.  
16 Namely, there is a site profile working group.  
17 My guess is at the next Board meeting this  
18 certainly could be something that could be  
19 brought up by the SEC work group on whether or  
20 not your mandate should be expanded to include  
21 for it also to be the site profile work group.

22 **MS. BEACH:** Thank you for that, John. I  
23 guess I haven't been through a lot of this,  
24 and I wanted to make sure where it was  
25 captured. I appreciate that.

1                   We now have about less than eight  
2 minutes left so, Joe, I know we cut you off.

3                   **MR. FITZGERALD (by Telephone):** No,  
4 actually, I think -- just trying to wrap  
5 things up. Issues one through nine, with the  
6 exception of the one we closed out on five,  
7 are really kind of similar issues. They deal  
8 with specific nuclides, questions of  
9 significance from an exposure potential  
10 standpoint and demonstrated dose estimation  
11 techniques that would satisfy the SEC  
12 concerns.

13                   And I think coupled with the roadmap  
14 we're going to be focusing on this long  
15 awaited records retrieval that we're going to  
16 hopefully get to in August. And I think a lot  
17 of these issues of significance and presence  
18 and exposure potential and what not, I think  
19 we can resolve in that context. So these were  
20 very similar issues. We could go through each  
21 of them, but I think it comes down to how  
22 significant were they in terms of exposure  
23 potential and is there an above and beyond a  
24 dose estimation technique.

25                   And we've talked a little bit about

1 gross alpha and what have you, but is there a  
2 technique that can be used that's claimant  
3 favorable. So we'll take it upon ourselves to  
4 carry these through in terms of our  
5 investigation next month, but we will provide  
6 an issue-by-issue response, as I indicated  
7 earlier, to each of these in response to the  
8 NIOSH paper.

9 **MS. BEACH:** And possibly we can think about  
10 getting back together late September  
11 timeframe. We're not going to set a date  
12 obviously today, but this gives us a path  
13 forward.

14 **MR. FITZGERALD (by Telephone):** Right.

15 **DR. ULSH:** In the five minutes that remain,  
16 Josie, are there any issues that jump out in  
17 your head as being the top issues that you  
18 would like to see us pursue? I mean, there  
19 are a lot of issues on the table here.

20 **MS. BEACH:** Right. Do you mind if I get  
21 that back to you in an e-mail and the work  
22 group?

23 **DR. ULSH:** Not at all.

24 **MS. BEACH:** Because I have mine listed as  
25 high, medium, and I think most of them are

1 listed as high.

2 **MR. FITZGERALD (by Telephone):** I might add  
3 we're doing a survey, internal review, on  
4 completeness of the internal side. I think we  
5 discussed the external piece that Ron brought  
6 up this morning, but we are working on that.  
7 And that pertains to, I guess, issues 11, 12,  
8 somewhere in that neighborhood, so that's  
9 ongoing as we speak.

10 **MS. BEACH:** Okay.

11 **DR. MAURO (by Telephone):** Josie, this is  
12 John again. By way of this, what I guess  
13 these issues related to going in and looking  
14 at the data completeness, data adequacy, the  
15 kinds of matters that Joe just made reference  
16 to, it appears that a process has taken hold  
17 on other sites, specifically the Nevada Test  
18 Site and Fernald whereby what I would call the  
19 data reliability, completeness issue is  
20 always, of course, fundamental to anyone of  
21 these SECs. And these issues have come up  
22 obviously during this conversation. What has  
23 been done in the past is after, let's say, a  
24 meeting such as this --

25 And, Joe, you may already be well on

1 top of this so please let me know if it's  
2 something that you've already taken care of.  
3 The first thing we do is put together what I'd  
4 call an overarching plan which identifies what  
5 I call the strata. That is, what facilities,  
6 what time periods, what categories of workers,  
7 perhaps what types of exposures are subjects  
8 of interest by way of data validation. It  
9 might be neutron exposures. It could be some  
10 type of radionuclide, internal radionuclides.

11 In other words you identify those  
12 datasets that are going to be important for  
13 dose reconstruction for the individual workers  
14 and also for building coworker models when  
15 coworker models are needed. So that's the  
16 first step is actually to sort of lay out what  
17 I call a master plan in terms of what are the  
18 categories of data that would be worth  
19 sampling in order to demonstrate that there is  
20 a robust dataset covering each of these  
21 strata.

22 And that's, in the past when presented  
23 to the work group, the work group would  
24 discuss it and then say, yes, we'd like you to  
25 proceed with that. And then we would go ahead

1 and move forward with what I call a sampling  
2 plan of, okay, how many cases will we sample  
3 from this strata and from that strata. The  
4 intent of which is when we're done we'd be  
5 able to say something insightful about the  
6 completeness and adequacy of data for each of  
7 the strata.

8 Now, I guess, this is what we've been  
9 doing on other SEC, large SEC petitions and  
10 evaluation reports. It sounds like the same  
11 type of thing is starting to take form that  
12 has emerged but not in that type of structured  
13 approach. You've already identified a couple  
14 of areas, but it seems that are all the areas  
15 of interest, are they in the process of being  
16 defined?

17 **MR. FITZGERALD (by Telephone):** Well, I  
18 think more for internal just to answer your  
19 question. I think for external it was a  
20 little more straightforward in terms of the  
21 MESH database and Ron -- yeah, you were on the  
22 phone for Ron.

23 **DR. MAURO (by Telephone):** Yes, I was.

24 **MR. FITZGERALD (by Telephone):** Identified  
25 pretty much what you called the strata in

1 terms of the cross-section of the facilities,  
2 timeframes and types of exposures. And that  
3 was the sampling in the sampling size as well.  
4 So I think the only difference is the, we  
5 didn't present a sampling plan before the --  
6 well, this is only the second meeting. But we  
7 didn't present a sampling plan between the  
8 first and today's meeting.

9 We went ahead using the entrée to the  
10 MESH database, and went ahead and did an  
11 evaluation based on a strata that we  
12 identified. So that's kind of what Ron  
13 presented this morning which was the initial  
14 sampling on the external side.

15 Now, on the internal side, that's a  
16 much more complex picture as you can guess.  
17 And that investigation's going on right now as  
18 far as trying to figure out what a sampling  
19 plan for these various internal sources would  
20 look like. So if the work group wants, we  
21 certainly can come forward with a plan for  
22 consideration. Again, I think it would have  
23 to be sooner rather than later because late  
24 September would be too late for this exercise.  
25 We're already sort of getting involved with

1           it.

2           **DR. ULSH:** Josie, I'm a little confused  
3 because I thought at the last working group  
4 meeting -- and I might have this wrong -- that  
5 we had talked about PORECON and PURECON and  
6 MJW's, for lack of a better word, validation  
7 of the two databases and how extensive it was.  
8 However, there was not a corresponding  
9 analysis of the external dataset. So I wasn't  
10 really surprised to see SC&A send over the  
11 external data completeness investigation. Did  
12 I miss something? Are we going to do that  
13 same kind of thing on internal?

14          **MS. BEACH:** Yes. That one just covered  
15 external, I believe.

16          **DR. ULSH:** Right, but MJW did in their big  
17 dose reconstruction project, they reviewed  
18 PORECON and PURECON and found a very low error  
19 rate.

20          **MS. BEACH:** But I believe that has not been  
21 completed yet for the internal.

22                   Joe, do you want to speak to that?

23          **MR. FITZGERALD (by Telephone):** I think what  
24 we had indicated we would review the Meyer  
25 report and review the MJW QA/QC from the dose

1 reconstruction. And we've been through that  
2 and have done that although we're not quite  
3 prepared to present the review results. But I  
4 think we initially said that the MJ review  
5 looked fairly robust in that we were focused  
6 on validating some of the radiochemistry  
7 procedures and were going to sample to get  
8 some feel for how that was done. But this  
9 would be likewise a very limited sample in  
10 terms of a plan, but it would be on the same  
11 level probably as what we discussed on  
12 external. But this would be coupled with what  
13 we did do which was to read two reviews.

14 **MS. BEACH:** I meant to say that earlier, but  
15 it said external so I assumed that everybody  
16 realized we were just talking about external.

17 **DR. ULSH:** Yeah, I knew that but at the  
18 previous working group meeting when MJW did  
19 their dose reconstruction back in, was it '95,  
20 it was the pre-'89 dose reconstruction. I  
21 think it was completed in '95. They were  
22 looking at internal doses, and they reviewed  
23 all of the internal data, compared it to the  
24 hard copy data, but that hadn't been done for  
25 external. So I thought that's why SC&A was

1 focusing on the external part.

2 **MS. BEACH:** And then they were going to do a  
3 review of the internal as well just to make  
4 sure the data integrity, completeness was the  
5 same.

6 **MS. CHANG:** This is Chia-Chia. I'm going to  
7 jump in here for a second. I believe because  
8 we're coming onto the end of the fiscal year,  
9 meetings before September 30<sup>th</sup> will have to be  
10 scheduled by the end of this month, before  
11 August. You could do this by e-mail and just  
12 figure out your best schedule, but just so you  
13 know you'll have to I think give Zaida the  
14 date if you're going to schedule it before the  
15 end of the fiscal year, before August.

16 **MS. BEACH:** Okay. And again, I apologize  
17 for the rush, the lateness of the hour now.

18 Joe, did we finish on the sampling  
19 plan? Does the work group want a sampling  
20 plan submitted, or are we going to wait for  
21 what Joe has, what John suggested?

22 **MR. FITZGERALD (by Telephone):** And this  
23 approach is going to reflect I think some of  
24 what Brant just said that we've looked at  
25 PORECON and certainly it looks adequate. We

1 would not propose to re-do much of what MJW  
2 did on PORECON, PURECON. Some of this really  
3 gets into areas that, based on the review that  
4 we did do of the MJW work and the Meyer  
5 report, are areas of interest where maybe it's  
6 not quite as clean.

7 So this is definitely a mixed bag.  
8 We're not going to propose replicating any of  
9 the work that to our way of thinking is pretty  
10 thorough and demonstrable. But there are some  
11 issues with certain radionuclides, and I think  
12 there's some questions on the tritium that we  
13 would like to at least look at that from the  
14 standpoint of what was done.

15 So we can certainly bring this  
16 forward, and I would certainly invite work  
17 group comment, NIOSH comment if you want to do  
18 it. But I don't think we have time to wait  
19 until the end of September if we're going to  
20 pursue this. I'd like to make that a nearer-  
21 term response if we could do it.

22 **MS. BEACH:** At this time I'd like to just  
23 leave it open, and we can think about it and -

24 -

25 **MR. FITZGERALD (by Telephone):** All right.

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**MS. BEACH:** So then I would like to call,  
unless anybody has a comment, a question.

(no response)

**MS. BEACH:** I'd like to go ahead and close  
the Mound work group meeting. Thank you all.

(Whereupon, the working group meeting was  
adjourned at 3:35 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 July 14, 2008; and it is a true and accurate transcript of the testimony captioned herein.

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

WITNESS my hand and official seal this the 8th day of January, 2009.

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