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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH
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WORK GROUP ON WELDON SPRING PLANT
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TUESDAY
JANUARY 25, 2011
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The Work Group convened in the Zurich Room of the Cincinnati Airport Marriott, 2395 Progress Drive, Hebron, Kentucky, at 9:00 a.m., Michael Gibson, Chairman, presiding.

PRESENT:

MICHAEL H. GIBSON, Chairman
RICHARD LEMEN, Member*
ROBERT W. PRESLEY, Member*
ALSO PRESENT:

TED KATZ, Designated Federal Official
ISAF AL-NABULSI, DOE*
RON BUCHANAN, SC&A
JOSEPH FITZGERALD, SC&A
DAVE HARRISON, ORAU Team*
MONICA HARRISON-MAPLES, ORAU Team*
STU HINNEFELD, DCAS
KAREN JOHNSON*
MARY JOHNSON*
JENNY LIN, HHS*
JOHN MAURO, SC&A*
ROBERT MORRIS, ORAU Team*
GENE POTTER, ORAU Team*
BRYCE RICH, ORAU Team*
MARK ROLFES, DCAS
TINA TRIPLET*

*Participating via telephone
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This transcript of the Advisory Board on Radiation and Worker Health, Weldon Spring Work Group, has been reviewed for concerns under the Privacy Act (5 U.S.C. § 552a) and personally identifiable information has been redacted as necessary. The transcript, however, has not been reviewed and certified by the Chair of the Weldon Spring Work Group for accuracy at this time. The reader should be cautioned that this transcript is for information only and is subject to change.
MR. KATZ: Okay. We have our illustrious Chair. Let's get started with roll call if I can set up -- so remind everyone to speak to conflict of interest, too, beginning with the Board with the Chair in the room.

CHAIRMAN GIBSON: Mike Gibson, Chair, no conflict.

MR. KATZ: And Board Members on the line?

MEMBER PRESLEY: Robert Presley, no conflict.

MEMBER LEMEN: Richard Lemen, no conflict.

MR. KATZ: Okay. Do we have any other Board Members on the line?

(No response.)

MR. KATZ: NIOSH-ORAU Team in the room?
MR. HINNEFELD: Stu Hinnefeld. I don't have a conflict at Weldon Spring.

MR. ROLFES: Mark Rolfes, NIOSH, no conflict with Weldon Spring.

MR. KATZ: NIOSH-ORAU Team on the line?

MR. MORRIS: Robert Morris, ORAU Team, no conflict.

MS. HARRISON-MAPLES: And Monica Harrison-Maples, ORAU Team, no conflict.

MR. POTTER: Gene Potter, ORAU Team, no conflicts.


MR. KATZ: Is that Bryce Rich?

MR. RICH: Yes.

MR. KATZ: Thank you. SC&A members in the room?

MR. FITZGERALD: Joe Fitzgerald, no conflict.

DR. BUCHANAN: Ron Buchanan, no
conflict.

MR. KATZ: SC&A on the line?

MR. MAURO: John Mauro, SC&A, no conflicts.

MR. KATZ: Okay. And there are no other federal officials. There are no other federal officials in the room. Any federal officials or contractors to the feds, HHS or otherwise, on the line?

MS. LIN: Jenny Lin, HHS.

DR. AL-NABULSI: Isaf Al-Nabulsi, DOE.

MR. HARRISON: Dave Harrison, ORAU Team, no conflict.

MR. KATZ: Last but not least, any members of the public, petitioners or otherwise, on the line?

MS. JOHNSON: This is Karen Johnson, petitioner, and my mother, Mary Johnson.

MR. KATZ: Welcome.
MS. TRIPLET: And Tina Triplet, petitioner.

MR. KATZ: And welcome, Tina, too. Very good. That sounds like a full deck, so let's get started. Let me just remind before I turn it over to the Chair, everyone on the line, please mute your phones except when you're speaking to the group. If you don't have a mute button your phone, press *6 to mute it, and then press * and then 6 again to unmute it if you want to come off mute. And please do not put the call on hold at any point, just hang up mind dial back in if you need to leave the call for a piece. Thank you very much.

And there's an agenda for the meeting that's on the website, and I hope has been emailed out to the petitioners. Mike, it's your agenda.

CHAIRMAN GIBSON: Okay. Our last meeting we started going over the issue
matrix, and there were some open issues or
some issues that hadn't been addressed. And
with Ted's help, we've -- he's identified some
issues that were left open or unresolved the
last meeting, so we'll just start with those
open issues. And if we get through those, if
there is anything that may have been omitted
or otherwise left out, we'll discuss that
then. So you want to start out with SC&A or
NIOSH, the first issue?

MR. KATZ: Mike, let me just
clarify what I did here is I didn't run
through the transcript to see what might have
been -- I don't recall what might have been
put to bed, but I just comprehensively pulled
from the list of SEC issues off of the matrix.
So that's what you have on your agenda. I
mean it's the same list, just written a little
bit more differently, but it's the list off
the matrix from November I believe.

MR. FITZGERALD: Mike, what I
propose is perhaps to get things kicked off, Ron can summarize where we were coming from and try to bridge from the last meeting and then identify what we've done since, then turn it over to NIOSH.

CHAIRMAN GIBSON: Sure.

DR. BUCHANAN: This is Ron Buchanan with SC&A, and I know it's been a while since we've addressed this site, and so for the members at the table and also on the phone, what I'd like to do is do a recap. And this recap applies to some of the details -- the SEC issues we'll get into later, so please bear with me.

What I'd like to go through as number one is a little of a history of the Weldon Spring site so we all see how these issues play in with the history of the site and also the document exchange that has taken place so far on the site. And then we can start addressing the individual issues.
And so the Weldon Spring site is located outside of St. Louis, Missouri. It handled concentrated uranium ore. It operated from `57 to `66, was its official operating period. It was an old emanation depot plant before that. They did not receive any radioactive materials until apparently June of 1957. They operated through December of 1966.

They were kind of a sister plant to the downtown Mallinckrodt Chemical Work Plant in St. Louis, and some of the workers out there. Some of the technology was transferred out there. It was to be a cleaner more modern plant than the one under the Manhattan Project downtown. And so it operated until December `66 when it was closed down.

Now, it had several years that kind of -- where it was going to be used for other things. `66 and `67 -- I mean `67 and `68, maybe `69, the Army was going to do some
herbicide production there. Some of the facilities were decommissioned and was going to be turned over to other things. That did not work out after some modifications had been made. And so it went into just kind of a maintenance mode from about `68-`69 into the 80's. Nothing much went on there.

Now Weldon Spring consisted of the main processing plant that received the uranium ore and concentrated it, melted it and turned it into uranium nuggets and such to be shipped out. Most of that material was removed, of course, at the end of the operation period.

Then in `80 to `85 and 90's timeframe, they came in and started doing characterization of the facilities. They had three -- the main plant. They had the raffinate pits for where sludge and the chemicals from doing the processing was pumped. There were a total of four of them
which were evaporation-type ponds. And then they had the quarry which is located a mile or so away from the main plant where they essentially act like a dump ground for mostly downtown site and for the Weldon Spring site. And so those are three main areas that we want to address in our issues.

Then they did the cleanup and the D&D work was in the 90's and it was finished, I think, in 2002. I was there a couple of years ago, and most of this material, it's either a large pile of rock, a pyramid-type rock structure which a lot of it -- so the higher material is encased concrete, sludge inside. And so at any one time, they had about a maximum of 600 workers there the busiest period in, say, 1960 or so at the site.

Uranium was used -- they received uranium in the way of ore concentrate or yellowcake. They changed it into metallic
uranium. They did receive some recycled uranium. One of the issues that we'll talk about is they started receiving that in the early 60's. They did receive -- and this is mostly from Fernald. That has not been verified 100 percent. Most of their material came from Fernald. They had enriched uranium, received some of that in the 60's. They did process some thorium in the 60's. And so this is where some of the issues come from which we'll address.

And so the period we're discussing on the SEC is during the operating period, '57 to '66, into '67 timeframe. Now in June of 2005, the Site Profile was issued, Volumes 1 through 6 covering the various internal and external and environmental site description.

In March of 2009, SC&A reviewed that Site Profile and issued their review of the Site Profile TBDs, and I think there were something like 25 Site Profile issues that
In September of 2009, SEC Petition 143 was qualified, and then in April of 2010, NIOSH issued the ER report which we are currently working on. And then in May of 2010, the Advisor Board authorized a focused ER review by SC&A for the ER. And then in October of 2010, the first Working Group meeting convened on the SEC here in Cincinnati. At that time, we identified a list of action items for both SC&A and for NIOSH, and after the meeting on the 19th, there were some email exchanges between NIOSH and SC&A on the discussion of the action items. And SC&A issued a list of what they understood the action items would be.

And so one of SC&A's charters was to do a combined matrix since we had discussed some of the Site Profile issues at the meeting on the 19th. And most of the SEC issues, to keep them straight, SC&A issued a combined
matrix for the Site Profile and the SEC on the
10th of November 2010. Now the SC&A has not
been tasked with the Site Profile issue
resolution, but we included that so we
wouldn't get the issues confused. Some of
them overlap, of course, and so it did cross-
reference on that.

On the 10th -- in November of
2010, SC&A issued their reply report to the
ER. And then in December of 2010, SC&A issued
the DWE paper on air concentration exposure
paper which actually comes from Fernald. And
we'll get into this in a little more detail in
later issues. Just wanted to make you aware
of that.

And then, of course, Weldon Spring
has relationship to Fernald since they receive
materials from there. And so resolution at
Fernald DWE issue has applications to Weldon
Spring, and I will go a little more in detail
on that.
And of course, we have our second Work Group meeting today, and in our action items and our matrix list, we have nine major issues that were considered SECS.

So if anybody has any corrections or additions to that -- if not, I'll start on the matrix issues.

MS. JOHNSON: Ron?

DR. BUCHANAN: Yes.

MS. JOHNSON: This is Karen Johnson. I just wanted to add one thing that wasn't touched on last time, and that was that 26-page report by Monte Mason. It was a note and summary of his visit in 1975 regarding uranium in urine values. I don't know if you recall that. I think Denise Brock sent a copy of it to everyone.

DR. BUCHANAN: Yes, Karen. This is Ron. Yes, I obtained that reference and have read it.

MS. JOHNSON: Okay. That's all I
had. Thanks.

DR. BUCHANAN: Okay. So if we want to start with the matrix. I hope everyone has a copy. Like I said, there's nine major issues. Issue number one has four parts to it, because issue number one is considered with the data -- the accuracy of the data and the adequacy of the data. And so, of course, we have four issues within that issue.

We can combine issue 1a and 1c which is internal and external data. So what SC&A needs to say, I think the Working Group needs to say is the trail of the data. For example, if the dose reconstructor receives information -- how was that data taken from the original recorded data at Weldon Spring in 1957 through 1967? By the way, the SEC covers 1957 through 1967.

Where is the trail, the paper trail so to speak? Where is the verification
that that data is accurate and complete and what systems were used? You know, what storage systems were used? How was this transcribed to computer systems or whatever it's on, and what verification has been done to make sure it is accurate and complete.

MR. ROLFES: I just wanted to put a caveat out there that NIOSH hasn't provided responses to each of these findings yet, but we're actually going to respond and send that out in writing in the future here, shortly after this meeting. Hopefully, about mid-February, we'll have our official responses, but we have prepared some draft responses at this time for discussion. So, basically, when we go out and complete a data capture, we will scan hard copy records into electronic files, into PDFs and upload them into our Site Research Database. We will also receive individual files from the Department of Energy that we request for each claim for a dose
reconstruction.

Part of what we have done to compare the data to its original source is we've compared some of the data that we received for an individual claim to data within the CER database to check to make sure that the numbers were accurately transferred and entered. This is something that we also do during the dose reconstruction process.

A lot of the times the PDF files that we receive for an individual claim which have radiation exposure information in them we will enter that data into an Excel spreadsheet for use by the dose reconstructors, and that data is also checked before it's used in a dose reconstruction and is also, as part of the reconstruction process, additional individuals will be able to check that data to make sure there are no mistakes. There are several layers of review within a dose reconstruction to ensure that the data that we
receive are accurately entered and used in the dose reconstruction process.

DR. BUCHANAN: This is Ron, SC&A. Describe this CER database, how this verifies the data, that original data.

MR. ROLFES: Well, the CER database was based upon the original hard copy data, and hard copy data was entered into the CER database from that hard copy data. I don't know if Monica might be able to elaborate a little bit further on, you know, any checks that might be in place, if you might know firsthand of any of that quality assurance that might have gone into entering the data into the CER database.

MS. HARRISON-MAPLES: I can speak to the CER database somewhat. The database was originally developed for an epidemiology study, so it was an independent capture of the Weldon Spring data before this program ever began. Those numbers were verified through
several layers within the CER organization. They're well-known throughout the country for their epidemiology work. We used the CER database as a double-check and a comparison in order to verify that what we had entered into our -- you know, what we were using for dose reconstruction didn't have any kind of errors. And where things didn't match up, those individual results would be triply questioned I guess is how we used the CER database for dose reconstruction.

MR. FITZGERALD: Very quick. This is Joe. Put another way, the CER database, even though it's a -- frankly, it was designed to be an epidemiological treatment, is used more of as a secondary check. It's not the primary check --

MS. HARRISON-MAPLES: That's correct.

MR. FITZGERALD: Because I think, you know, certainly epi database would not
have necessarily the QA that you would have
for a verification for this program, but
certainly it offers a secondary check.

So the primary check would be, I
guess, a firsthand review by NIOSH. I'm
trying to get a sense of how you actually
validate, you know, the V&V validation and
verification database. Or is there? I mean
is CER basically how you validate?

MS. HARRISON-MAPLES: Oh, okay.
I'm sorry. I wasn't following the question
very well. No. As Mark alluded to, we
repeated the data from the DOE files and from
site data captures. That information is then
entered into spreadsheets for the dose
reconstructors, but the dose reconstructors
also have copies of the original material that
was received through the data capture and
received from DOE. So as a secondary check,
their procedures include them going back to
the original data and verifying what they're
using. If there's any kind of question, the CER database would be sort of a tertiary check.

MR. FITZGERALD: Right.

DR. BUCHANAN: This is Ron, SC&A.

So the hard copy has never been transformed to an electronic database totally and used alone? You're saying that all dose reconstruction is done -- or the dose reconstruction has available to him all original, her scans and all of the original data. Is that correct?

MS. HARRISON-MAPLES: Yes. All of that is uploaded into the SRDB and is always available to the dose reconstructor.

DR. BUCHANAN: So when a dose reconstructor does it, a dose reconstruction, in those DOE files, there are photocopies of all that worker's handwritten doses or typewritten, whatever they were from the time they originated?
MS. HARRISON-MAPLES: Everything that we've captured is available in the SRDB, yes.

DR. BUCHANAN: Okay. What has -- where are these physical records set? Is there any verification that these records are -- I guess, you know, the next point then, okay, so the dose reconstructor has scans of the original handwritten or typed results, biological or bioassays or external dose, has there been any verification to show that those records he has are all that's available? So what's been the chain of custody of these records from 1958 when they were written down to when he just, in 2011, did a dose reconstruction?

MR. ROLFES: Well, within each claim file -- I'm not sure exactly what you're asking -- but with each claim file, there are electronic spreadsheets that are used by the dose reconstructors, and those become part of
the administrative record for that individual's claim. Basically, any and all of the bioassay and/or dosimetry data is entered into an Excel spreadsheet for use by the dose reconstructor, and that is what becomes part of the administrative record. The firsthand receipt of data from the Department of Energy is also in the NIOSH-OCAS claims tracking system, and that's available to the dose reconstructor as well.

DR. BUCHANAN: Okay, but all of this was taken from original datasheets someplace?

MR. ROLFES: Correct, out of a DOE repository for example.

DR. BUCHANAN: Okay. I guess my question is, is the scanned copies that the dose reconstructor -- go back and verify the spreadsheets with the site, how are they -- how do we know that they're all there? I guess the accuracy wouldn't be of question if
they're scanned copies, but the completeness of the records from the day -- you know, a guy worked there for five years or so, how do we know we have all his data scanned?

MR. ROLFES: I guess you can ask the question of anything, you know, how do we know we have everything. And there's no way to answer that yes, we have everything without knowing that there's something else out there, so --

DR. BUCHANAN: Well, I mean there's certainly some process in place to demonstrate that we have his records. You know, this is if the dose reconstructor had a photocopy of that individual's records, then he has the accuracy of the records, if they're readable, but he doesn't know that they're complete. And I guess that's a --

MR. ROLFES: Sure.

DR. BUCHANAN: A loop that we need to close is how do we verify that they are
MR. ROLFES: So what we would need to do, for example, is take a look at an individual case, and if you had an individual that was employed doing the same job for the entire, you know, `57 through `66 time period, was monitored from day one via urinalysis and also wore an external dosimeter for, you know, the first three years, but then suddenly, there was a gap in his monitoring data, that would identify, hey, what happened here. That would attract our attention rather than, you know -- it would make us focus on what happened here, what do we need to look for.

And in cases where we don't have data for that time period, there are several ways that we can address by assigning the surrounding dosimetry data to fill in that gap. We can also take a look at coworker data, for example, in certain cases. So when there are gaps that appear, that's normally
part of the dose reconstruction process that attracts our attention to it. For example, for a uranium bioassay result, if an individual routinely submitted samples, say, every six months, and didn't have one at the regular six-month interval, you can use those surrounding bioassay results to estimate the chronic intake that occurred over that time period when the individual wasn't monitored.

DR. BUCHANAN: This is Ron with SC&A. I understand what you're saying, Mark, in that if there's some individual dose reconstruction and you extrapolate from other periods. Now one problem at Weldon Spring is that there were some periods where there were spot bioassays and covert badging, that sort of thing. But besides that, I guess what you're saying is that you're leaving it up to spot it in an individual dose reconstruction in filling the gaps, but there's been no verification, chain of custody so to speak of,
in the records as an overall for Weldon Spring. We're taking it kind of on face value that the records that are there are complete or as complete as necessary.

MR. HINNEFELD: Well, this is Stu and I'm glad you modified the statement there. I don't know that we can ever take on face value that we have captured all the records generated at the time on any site. Okay, we can capture what we can capture. If in fact there are voids or gaps in a person's exposure record, then we have techniques for doing coworker dose reconstruction or whatever the appropriate approach is for filling in those gaps in that.

You wouldn't assume someone was non-exposed if you had a gap in their exposure record. There would have to be some other evidence, you know, a reason, like he was switched to an administrative job or he was laid off for a year or something like that.
But there would have to be a reason to consider him non-exposed, and so his exposure -- and so we'd be doing that. I mean that's something we've done a lot. I mean we don't go into this, we can't go into this presuming that every record that was generated that we got, and so we make those adjustments to the dose reconstruction in those situations.

DR. BUCHANAN: Okay. This is Ron again. So the CER database, what was confusing me was on the CER database, because it is not complete. We know that because it wasn't intended to be for dose reconstruction. And so you're saying you're just -- you take the original data, you put it into a spreadsheet for the dose reconstructor to use, and then you compare that to what's found in the CER to see if it matches that and if there's any missing from that or any discrepancy. Is that what you're saying on the CER database?
MS. HARRISON-MAPLES: Essentially.

MR. ROLFES: On our Evaluation Report, we did compare the CER data to our data, but we're talking about the SEC evaluation versus the normal dose reconstruction process and they're slightly different. And I think we answered about the dose reconstruction process. If Monica could answer about the Evaluation Report, how we compared the data in the CER database to the hard copy data. Monica, do you understand what Ron's asking?

MS. HARRISON-MAPLES: No. I'm sorry, I had to step away for just a second. Could someone repeat the question for me?

DR. BUCHANAN: Yes. This is Ron with SC&A. The question is that their CER database was only used -- you just did some double-checking of your spreadsheets against the CER database. You did not use the database for dose reconstruction. You just
were comparing your NIOSH's spreadsheets taken from the original data against the CER to see if there was any discrepancies or error between the two. Is that correct?

MS. HARRISON-MAPLES: You're talking about in the ER evaluation, that is correct. Within the ER, we just used the CER database to double check.

DR. BUCHANAN: Okay. So the CER database is not actually used during the dose reconstruction process?

MS. HARRISON-MAPLES: I can't say that it's not used ever. As I said earlier, if there is some sort of a question between things, it may be used as a check, but to the best of my knowledge, it's not ever used as the primary source of information for dose reconstruction.

DR. BUCHANAN: Okay. Thank you.

MR. ROLFES: Welcome.

DR. BUCHANAN: Okay. I think that
clarifies some points that weren't clear in
the past. I'll move on. If there are any
other questions, comments? I'll move on to
the next issue.

MEMBER LEMEN: This is Dr. Lemen.

MR. KATZ: Yes, go ahead, Dick.

MEMBER LEMEN: I had a couple of
questions on what percentage of the estimated
total workforce do you have records on?

MR. ROLFES: Dick, this is Mark
Rolfes, and I have to check back in the
Evaluation Report. I can pull it up here if
you'd like to wait a minute, but we do have
that detailed in our Evaluation Report. I
don't know, Monica, you might be able to get
it faster than I can. If you wouldn't mind
taking a look as well.

MEMBER LEMEN: Along with that
same question, of those percentages of the
ones that you have of the estimated, how many
of those do you have individual dose data on,
what percentage?

MS. HARRISON-MAPLES: May I ask a clarifying question? You're asking how many people do we have dose data on for the entire workforce?

MEMBER LEMEN: Yes.

MS. HARRISON-MAPLES: We don't collect dose data for the -- well, the CER database would have dose data for probably most of the entire workforce, but within the NIOSH project for dose reconstruction, we collect dose data for claimants, so --

MEMBER LEMEN: Yes. I understand that but of the claimants, how many actually have dose data and not estimated data?

MS. HARRISON-MAPLES: That I know -- that we do have in the ER report. Let me continue to look for my version of that.

MEMBER LEMEN: That's all I got. I'll wait for your answer.

MR. FITZGERALD: Yes. I guess,
Mark, you're looking for the data.

MR. ROLFES: Correct.

MR. FITZGERALD: While you're looking for the data, I'll go back to something Stu said earlier, which I think this is sort of a dilemma that we face with most of the SEC sites, knowing whether or not what DOE gives you is actually a complete set and how would you know if it weren't, which has pretty important implications for things like coworker dose. You want to make sure that you have a complete set to operate off of.

I'm hearing that you're using whatever documentation was captured, individual dose reconstructions, as you go through individual dose reconstructions. That's the answer you were referring to is the dose reconstruction answer.

For the SEC answer, you point to - I think you're pointing to things like the CER database as a check, you know, for
completeness. Now the pause I have on that, and I'm just trying to think about this, is that I suspect that the CEDR project which generate the CER database, the epi project at DOE is probably relying on the same set of data that it made available to NIOSH and that acquisition of data for the site.

So there's a -- I'm a little concerned that you're using the CER database, but they all may come from the same source of what exists for the site and what's been presumed to be a quote, unquote, complete set of data for the site, although, you know, I don't think DOE necessarily -- I don't know for sure, this is something maybe it would be worth looking at -- has performed a validation that this, for all intents and purposes, represents the dose data that was generated at the site, and there are no gaps or no questions about individuals that may or may not have been monitored.
From what I've heard, I don't yet get a sense that that loop has been closed, that you really know that what you got -- and I understand the frustration, you know, how do you know it's complete -- but I don't know whether DOE, before they generated the CER database, might have gone through some exercises. It's possible. I think some of the sites did do a V&V, a validation and verification of their data before they compiled it. I'm not sure about that though, and I'm not sure whether they might have done that before they sent the data to NIOSH. And so I think there is an inquiry that may or may not have been done.

To just figure out has anyone really gone through and tried to -- I think Dick Lemen was getting to the point I was thinking about too -- well, I'd like to know what the employee, you know, if you have an employee list by year, maybe even by work
categories, there may be a way to get some sense of whether there's a consistency in the amount of individuals included in the database versus what you should be seeing by virtue of the employee list. And we've done this at other sites, but so far, I haven't really heard the kind of check that Los Alamos -- their V&V was going back through logbooks and just trying to make sure that anything that was earmarked as a, in that case, a bioassay. You could crosswalk and find a record, a dose record. So, you know, there's a V&V process that most sites go through. I don't sense yet that we have that. We may. I just don't sense so far that we have covered that, whether DOE has done it or whether you all have done it.

I think what you've been using is the CER as a check, but I'm concerned that that may actually be using the same understood data as a basis, so you'd be checking against
the same data you're acquiring from the DOE.

MR. HINNEFELD: Okay. This is Stu and I'm not as familiar with the situation as most of the people, but I want to make sure I understand where we're going here. So when you say the completeness of the database, the database, I guess, is the CER database. Is that true? Is that --

MR. ROLFES: No, no --

MR. HINNEFELD: What database are we talking about?

MR. ROLFES: We're talking about the database that DOE, when you go to each site -- and you did this 6-7 years ago and said, you know, we need the dose record for the site, and they ship over what they've got. And you collect through data capture other documents which would be used to corroborate during dose reconstruction. I'm going to the SEC context. I like that distinction you made. You know, SEC context says, okay, how
do you know that you're dealing with a full
deck of cards. Well --

MR. HINNEFELD: Okay. Now so
there is another database, besides the ER, for
Weldon Spring?

MR. ROLFES: I'm not aware of that
and that's what I was going to say. Usually,
when DOE, at least in the earlier years of
this program, DOE would go back and pull hard
copy records. They may have changed things
now and put things into a database. I don't
know if that's been done or not for this
specific site. You know, for example, like
with Fernald, they've entered all of their
hard copy data into a database. As far as I
know with the Weldon Spring site, there is no
electronic database. It's all hard copy
original records still. So --

MS. HARRISON-MAPLES: Mark, that's
correct, there is no database.

MR. ROLFES: Okay. Thank you,
Monica.

MR. HINNEFELD: So in terms of is the database complete compared to an employee roster, the check that could be made there would be on the CER database? Does the CER database contain data for the employees or at least employees' job categories that you would expect to have monitoring data on? I mean that sort of completeness can be done. And that would be important because the CER data is used for the coworker approach?

MR. FITZGERALD: Well, no, no. My point was I would like to know that the CER database, if you're going to use it for that purpose, was validated when they put it together by DOE so you know you're not using the -- if the CER database was based on these hard copy files, then literally, what you got from DOE and the dose records and the CER database are one in the same, so of course, you would expect them to agree. You know,
they're using the same source of information. But I would like to know that when they put the CER database together, just somebody said, you know, I want to make sure that we did -- this is as complete as it needs to be -- were records lost; are there gaps, certain gaps that we're seeing -- that somebody asked those questions. Very well they may have when they put the CER database together.

MR. HINNEFELD: Okay. So the question here then is the CER database, did it faithfully capture all the records available and was there a sufficient QC done on that.

MR. FITZGERALD: If NIOSH proposes to use that as a means to validate that it's got what it's got and so that would be where I would look and say, you know, how was that actually compiled, and did somebody ask that question. Do we know we got what we need to have or not in terms of the actual dose
records at the site.

MR. HINNEFELD: For what purpose are we using the CER database? I guess that's what's puzzling me.

MR. FITZGERALD: We don't use it right now for dose reconstruction. We rely upon the hard copy records that we received for each individual's DOE response. Separate from that, we did take, as a secondary check, as Monica had explained, we used the CER data to double-check to make sure that we received as much data as is available.

MR. HINNEFELD: So now when we do that, what does that mean? We look, we see Joe Smith, and we've got a series of hard copy record for Joe Smith, which is what we got on his file. And we said, okay, we have this other source of data, whoever built the CER database a number of years ago also built a line. Let's see if they built a line for Joe Smith. Then look, they built a line for Joe
Smith. And look, his external adds up to higher than these individual hard copies we have. Is that what we do? I'm sorry, I just don't understand how it plays into the question at all.

MR. FITZGERALD: Well, what we're hearing is that it's used as a secondary check on completeness. I don't disagree with that.

I'm just saying that do we know that the CER database, which is an epi database, was constructed in a way which, in fact, examined the question of did we, in fact, collect all the necessary records or not.

At some point, somebody's got to ask the question how do we know we got the set of records which were generated at this site. And you said before, we'll never know. Well, I think that's part of the program that we need to ask those questions and to make that inquiry, because for something like a coworker approach where you're going to be relying on
the completeness to make some judgments.

So I'm just trying to go, step backwards to try to figure out, okay, I don't have any problems with certainly the CER database being that check on completeness, but I would want to know that somebody didn't just simply throw paper together and that was the CER database but really went through some process of validating the historic completeness of that, because a lot of sites, you know, and we've experienced this at different places, records were disposed and lost and discarded and you name it. And the question is how -- what gives you some confidence that you have a complete set or not.

MR. ROLFES: We can look into CEDR and see if we can possibly get some kind of information from them as to the quality assurances of the CER data. Monica, is this something that we should be able to get from
CEDR?

MS. HARRISON-MAPLES: I'm sorry, did you say me?

MR. ROLFES: Yes. I wondered if -

- 

MS. HARRISON-MAPLES: First word got lost. I wasn't sure you called my name.

I believe that we can go back to CER and to CEDR and try and find some sort of verification procedures from them.

MR. ROLFES: Okay.

DR. BUCHANAN: This is Ron. I don't -- I kind of agree with Stu on this that you can't really trace -- I mean I'm not saying that's a bad idea is that you could look at CEDR, but since we don't use that for primary dose reconstruction, I think it should be focused more on the data we do use. We're using the scanned copies of the originals and then the NIOSH creates a database from that to be used in dose reconstruction. And the dose
reconstructor has the originals to refer back to if he needs to. And checking the CER database verification would be okay and if that would be reasonably to do.

But I don't think that necessarily defines the root problem of do we have external data in the bioassays from the worker. And that almost goes back to the other sites we've looked at where you go in and do, you know, 20 or 30 claims and see if there are significant gaps in a worker's data that should have been monitored or think potentially should have been monitored. That's what we have been using in the past. So not that CER is a bad database, but I don't think it's the final answer to this question.

MR. ROLFES: So, Ron, what you're asking then -- this is Mark Rolfes -- would be a claim-specific dose reconstruction essentially, because that is what, in fact, we do during the dose reconstruction process is
try to identify any of those shortcomings in monitoring and apply claimant-favorable assumptions to ensure that we've overestimated the person's potential dose rather than underestimating it.

DR. BUCHANAN: On an individual dose reconstruction, I agree with you. Now from an SEC point of view on the completeness of the data being used generally, to answer that question, the only sense, like Stu says, you can't be sure you got every box of files and stuff. You know, what we resorted to in past sites in this question is to go back and randomly select 20 or 30 claims and look at their records and see if they're recently complete for the periods that they would have been exposed. And I don't think that's been done in any way, you know, like we've done for other sites.

DR. MAURO: This is John Mauro. I'd like to weigh-in just a little bit. The
concern that's being expressed here is one
that really gets to almost a ground floor of a
process, that is when you initiate a process,
whether it's to capture data to do dose
reconstructions, to write a Site Profile, or
to support an ER, you know, you rely on DOE.
You make -- I've seen the letters. You send
the letters out to the workers and material
comes back on worker-specific data. Then
there's a data capture effort where you try to
capture hard copy or electronic everything
that DOE has, and what shows up shows up, and
you have this array of information available
to you now to support the work that needs to
be done.

It's my understanding that once
that process begins for a Site Profile or an
ER, you have -- there appears to be an ongoing
data capture process which, I guess, now that
we're having this discussion is sort of
dawning on me that the idea that you have a
complete data set is always a troubling issue.

That is has DOE done everything they can to try to find relevant records that might pertain to either an individual worker or to the site in general when you're trying to do coworker development if that's necessary to fill in gaps? When you engage in this process for giving yourself a level of assurance that you think that you've done everything reasonable to capture all the data and that DOE has done everything reasonable to capture the data, is this something that's written down?

I have to say that I've always looked at it from the point of view, okay, here are the records that are available to us. We go into the site query database. We go into individual case files, and we use what we have to say something intelligent about whether we think the records are fairly complete and you can do a dose reconstruction
and/or build a coworker model or whether or
not there might be some sufficient
deficiencies in perhaps certain aspects of the
data. This is a deep question, and I have to
say I don't know if we've had this
conversation before. That is are there
specific steps that NIOSH typically goes
through to make sure that all parties
concerned are being as exhaustive as possible.

I remember visits to various record centers
that were off site in different locations to
capture records, whether it was air sampling
data or any other -- those kinds of records,
which became part of a data capture process
but usually that was well into, let's say, a
review cycle, like things that have been done
with Pantex and Mound, et cetera. And
Fernald, it happened with the thorium-232
DWEs.

I guess the question is really and
now we have before us Weldon, and the question
becomes, "Okay, as this issue applies to Weldon, were there any steps taken to provide, whether DOE or NIOSH, to say, okay, are we fairly confident that we have captured all the data?" In this case, it sounds like hard copy data as opposed to some kind of electronic data, that there are some records that might be missing. The first question is do you folks at NIOSH have a procedure -- I haven't run into it quite frankly -- we reviewed a lot of procedures -- where you actually talk about what are some of the things that need to be done to try to be as exhaustive as possible?

MR. ROLFES: I guess that question was for us, John Mauro. This is Mark Rolfes. We've gone on a number of data captures for the Weldon Spring site, and originally, when we developed the Site Profile, we identified records in Oak Ridge. Subsequently, during the SEC evaluation process, we also identified additional records in the Oak Ridge vault.
There have been records that have turned up from Fernald and other sites across the United States. Anytime we go on a data capture trip to one of several tens of different DOE repositories, for any DOE site that we find information, we always capture that whether or not that's our original intent. If we're going out to look for Fernald data but happen to find something for Weldon Spring, we'll also capture the Weldon Spring data.

So we've gone on many data captures since the inception of this program looking back to the earliest days of the Manhattan Engineer District to look for and identify anything relevant to our program. And it's not just a one-time effort. If we learn about new data, we pursue that data and make sure that we do our best to capture as much as possible that's relevant to the dose reconstruction process.

DR. MAURO: Is there something
that exists in any guideline or is it just not possible? In other words, is this -- the nature of the process is a form of research that unfolds before you as you dig? Or is there some set of -- there might be a procedure that says, okay, as our first cut, in addition to opening up the -- having your MOU with DOE and making your request for data -- protocol, are there other guidelines to help to search the one you just described? Or is it really something that is allowed to unfold as you learn more because, you know, depending on the site where there might be a repository, might be different?

I'm actually trying to get to something standardized. And if there is something that's standardized by way in which you folks at least give yourself a sense of assurance and therefore documentation that you've then exhausted and captured data as you can, that you did, in fact, follow that
procedure, that that procedure was reviewed
and approved and that, in fact, your staff in
this particular application, on Weldon, in
fact followed that procedure. Or is it really
something that's not written down and it's
really ad hoc and you document as you go
along?

MR. ROLFES: I'd say most of the
time, if we have a data deficiency, we would
identify that either during a peer review at
the Oak Ridge Associated Universities team or
during the final review and approval of the
technical basis document within DCAS. And,
you know, if we have identified, for example,
during the review of a TBD that there are some
shortcomings in the thorium data or the dose
reconstruction approach proposed in a TBD, we
would ask the Oak Ridge Associated
Universities team to go back and look for
additional data. Or, you know, DCAS itself
would go out and look for additional data to
make sure that we've got as much data as we possibly can to develop a technical basis to complete a dose reconstruction.

So there's not something that's written down, but if we identify deficiencies in a technical basis document, then we would go out and pursue additional data to look, to make sure that we've collected everything that there is. And once again, as Stu and I have said, we're never going to have every piece of data, but we do have a very comprehensive -- I think we've collected nearly 100,000 documents for this project only within our Site Research Database. That does not include the individual's dosimetry records that we have within our NIOSH OCAS Claims Tracking System.

So we're not dealing with a small volume of records. It's a rather comprehensive and large number.

MR. HINNEFELD: John, this is Stu.

To your question is there a procedure for
this completeness of search, I don't think that there is a procedure written like that and probably because different sites are sort of site specific.

DR. MAURO: You know, and I respect that and can understand that because I've seen the process at work. What I'm hearing though is that there is a degree of due diligence that you have brought to this particular case whereby, as Mark just described, the various things that were done to review the hard copy and perhaps the CER data, certain questions you posed to it, things you look for, certain data capture efforts that follow-up as a result of that process.

In other words, what I'm hearing is there may very well have been an aggressive effort to be as exhaustive as possible, the degree to which that can be recorded so that all folks concerned feel that there was a
degree of significant effort made to make sure you're as complete as you can be, what I'm hearing is that perhaps the Site Profile -- and you can answer this for me because I got to say I haven't read the Site Profile, not in quite some time -- whether or not that kind of descriptive material on the various steps that were taken to confirm to try to make sure there are no people or types of data, whether it's bioassay, air sampling, film badge data, whatever, radiation work permit data, you know, that what steps were taken to make -- to try to be as sure as possible, working with DOE and their various records processors, that you've captured everything that, I guess, is reasonable to be done. Is that written up somewhere? I'm hearing that that is not written.

MR. FITZGERALD: John, this is Joe. I just sense that we're kind of getting off the mainstream topic on this one. There
is no question that there was a high degree of
due diligence in data capture, and we see this
in most sites. I mean I think NIOSH has gone
through a lot of effort to pick up whatever
records are available.

Our point goes to something a
little different, though, saying that quite
apart from that due diligence and the process
by which you collect as much as you can, at
some point there's a question that has to be
answered, which is, well, how do you know you
have a complete set of the dose records
themselves. Clearly, you take what DOE gives
you, and I'm sympathetic to Stu's comment that
it's hard to know if you got it all. But
that's the charter that the Board has given
itself as far as data adequacy and
completeness because the implications that has
for things like coworker dose model
development and what have you is to answer the
question, do you believe or have confidence
that you have all the necessary records for
dose reconstruction from that particular site,
and how do you know that. And there are
different ways to answer that. And we
actually have answered that in different ways,
different forms at different sites.

And some sites, DOE, and sometimes
in conjunction with NIOSH, has gone through a
lot of trouble to do a V&V, verification and
validation, of that database before it's
actually employed in dose reconstruction.
Other sites NIOSH has done things, and
actually SC&A has done on occasion, the kind
of sampling that Ron's talked about, which is,
okay, let's query the database and do some
sampling to see if we feel confident we have
it all.

MR. HINNEFELD: This is Stu. Let
me just offer this. I've been -- to satisfy
my own curiosity, I've luckily found a Weldon
Spring claim that reported the exposure
history, that we have their exposure history. I don't know if this is -- if they're all like this or one. This is the first one I've looked at. What we did on exposure record, when we asked the DOE for the exposure record from Mallinckrodt, we got freaking everything. We got the personnel security questionnaires, and it just goes on and on and on.

And then for the dosimetry section, we also have a handwritten, you know, image of a handwritten dosimetry card that shows the year, 1957, the weeks, and then every other week, there's an entry for beta and gamma. So this apparently is an image of the record kept at the site and for most years. And I haven't done a study and I've only looked at one claim, but in this case, there seemed to be data every other week which would indicate to me they run a two-week batch. Exchanging that a little later on, there's data once a month or something like
that.

And so from that standpoint, having received this, we can make a judgment if there's a data entry every two weeks, we currently have the complete record for this --

MR. FITZGERALD: For the individual, yes.

MR. HINNEFELD: And so Ron's point a while ago was, you know, he suggested maybe that we take a random sampling of the 260 some odd claims and do that kind of check on those claims to see if, in fact, these tend to be complete, you know, there's not a year missing or a page missing or something like that. And then -- and so have some sort of report on that, and that would indicate that for at least this sampling of people that we have chosen, there seems to be some level of confidence that the exposure records that are retained by DOE and provided to us in response to requests are complete. Is that what is
suggested here?

MR. FITZGERALD: That answers one of two dimensions to the issue.

MR. HINNEFELD: Okay. That answers which one then?

MR. FITZGERALD: Well, you know, for example, at another site, Rocky Flats, we felt that the validation in terms of completeness, we had all the records, but then the question was did you have all the records for all the years that individual would have worked in a certain operation. So we, in fact, did the sampling that Ron brought up for that purpose, to answer that question.

But it doesn't answer the question whether or not you have all the individual records to begin with, that, you know, you're operating off this presumption that what you have is, in fact, 100 percent of the monitored workers at that site. I don't know if that question has been answered. Do you have --
MR. HINNEFELD: The question about do we have 100 percent of the monitored workers -- I'm trying to --

MR. FITZGERALD: Records for those workers.

MR. HINNEFELD: Okay. Do we have the records --

MR. FITZGERALD: For the records that you do have, they appear to be very comprehensive. You have everything from hard copy up to, you know, you have a whole file on every individual worker. So for the ones you do have, it looks like it's pretty comprehensive. The only question may be, similar to what Ron's raised, are there any gaps that may exist for those individual records.

My question is a little different. How do you know you have all the individual records to begin with and has that been validated by DOE before they made those
records available.

MR. HINNEFELD: All the individual records meaning that there are some people for whom you should have records that we didn't get.

MR. FITZGERALD: Of course, at some sites over the ensuing history, some records were discarded, some records were lost. I mean that's been the nature of the beast for every site. And the question is what we typically do is establish has anyone done comparisons, for example, against employee lists, or has anyone looked at the documentation you've collected, done some way of -- is there anyone that appears that they should have been monitored or were monitored, did have records, but we don't have a file necessarily in this group of files that DOE sent over.

MR. HINNEFELD: Okay, well, so that process would require then finding a
roster, maybe several rosters, annual rosters or whatever, preferably with job titles because I don't know what they're monitoring practices were and if there were any unmonitored people or anything, finding on that roster all the claimants because we would only have the individual exposure records for the claimants, finding on that roster the claimants. And then for that list of claimants, all the claimants on the roster, did we get an exposure record from them.

MR. FITZGERALD: But you have exposure records not just for claimants, you have exposure records -- you would presumably get exposure records for everybody that -- I mean for all the records they happen to have at --

MR. HINNEFELD: I don't --

MR. FITZGERALD: They only sent you --

MR. HINNEFELD: -- why we would
have gotten that.

MR. FITZGERALD: They would only send -- most of the DOE sites have sent whatever they had in terms of records, and then you would cull them out for dose reconstruction --

MR. HINNEFELD: No, no. Most sites send us a response to an individual claim request. For the individual exposure records, we get -- we ask what are the exposure -- what exposure records do you have for Joe Smith, and they send us Joe Smith.

MR. FITZGERALD: Right.

MR. HINNEFELD: Okay. That's how we get individual exposure records. On data captures, on occasion, particularly when we're building a coworker model, we may ask for the complete database, like this 20 at Fernald, for purposes like building a coworker database, or maybe if we're getting air sample data which aren't going to show up in the
bioassay record. So we may on occasion, at some sites, ask for the complete database. But that's not the routine, and not every place had an electronic database of all their records. So we don't, as a routine -- as a routine matter, we ask for Joe Smith. We get Joe Smith's record, and that's what's in that guy's file, and that's what I'm looking at when I see these data every other week.

MR. FITZGERALD: And there hasn't been an instance when you've had a claim that you haven't got a record back from DOE?

MR. HINNEFELD: Well, now Ron suggested that we do that.

MR. FITZGERALD: No, no. I'm just saying that there hasn't been an instance where you requested a file that you didn't have dose data provided by --

MR. HINNEFELD: Oh, sure. I mean I don't know about Weldon Spring, but, yes, there --
MR. FITZGERALD: Well, I'm just saying for Weldon Spring. What I'm sort of getting at is, you know, we're looking at the completeness of dose records at Weldon Spring, and it's almost -- this is almost an empirical process where you sort of know if you -- you know, how complete it is by virtue of whether you get a positive response from the site every time you have a claimant come in.

MR. HINNEFELD: No. I think what we're saying is that if we don't get exposure record for a person, and I don't know if it happens at Weldon Spring, but I know a lot of sites it happens that people either weren't monitored, or we don't get a record, or the DOE can't find a record of the monitoring, in that sense, then we would have to make a judgment about this person's exposure potential. And usually, in that situation, we go to a coworker approach, and, you know, there are some levels then there which, I
guess, is a -- if that's going to be debated, it's probably a debate for a different group because it's used everywhere as opposed to just at Weldon Spring. But -- so that's what would be done in that circumstance for a person who fits into what looks like a monitored position, should have been monitored and for some reason, DOE doesn't have the exposure record. Then we would have to use some alternative for a dose reconstruction. Or if we feel like we can't build a sufficient coworker model that -- that's led to a bunch of SECs.

MR. FITZGERALD: Well, yes, that's kind of where I'm headed to some extent because at some point, in order to fill in gaps where you don't get a response and you have to assign a coworker dose, perhaps by worker category, you do need to know what the dose distribution is across the monitored employees for the site. So that gets you
passed the empirical just asking and getting to looking at the set of records, the monitoring dose records for the site and deciding whether or not you can do a distribution to support a coworker -- and that entails that you know you got them all or that you can at least --

MR. HINNEFELD: It entails that the site records that you received do not inordinately discriminate against more highly exposed people, that more highly exposed people were not in some way systematically excluded from the record you got. It does not necessarily require that 100 percent of the records collected are there because --

MR. FITZGERALD: But --

MR. HINNEFELD: -- you would expect them not --

MR. FITZGERALD: -- you're switching from individual records one at a time to looking at the body of dose records
This transcript of the Advisory Board on Radiation and Worker Health, Weldon Spring Work Group, has been reviewed for concerns under the Privacy Act (5 U.S.C. § 552a) and personally identifiable information has been redacted as necessary. The transcript, however, has not been reviewed and certified by the Chair of the Weldon Spring Work Group for accuracy at this time. The reader should be cautioned that this transcript is for information only and is subject to change.

1 for the site to come up with that distribution. I agree with what you're saying, but at some point, you do the macro of what records you got.

   MR. HINNEFELD: If needed for a coworker.

   MR. FITZGERALD: Coworker dose. And it's conceivable, and this is another issue, but at some point, you're not going to get a response that you have a dose of record and it's somebody in a worker category who obviously looks like they should have been monitored but you don't have a record for them. You have to make an assignment and that will compel, I think, you to have to do that review or analysis to come up with the coworker estimates.

   And I don't see how you get there unless you do what we were talking about, which is to verify that the complete deck of cards as far as the dose records for the site
are available, we can look at it, and by worker category feel like we can come up with a distribution for certain worker categories and assign it as a coworker dose. See, at some point, you get to the point of having to make an assessment of the completeness of the data at the site.

MR. ROLFES: And to answer that, also, Dick had brought this up earlier, he had asked about the number of people that were monitored at Weldon Spring site, and this is presented in the Evaluation Report on page 14 in Table 4-1. I just wanted to answer this really fast and also another thing that John Mauro had previously asked. Anyway, here we've got a description, the total number of claims submitted for dose reconstruction from the Weldon Spring site was 258 at the time of March 12, 2010. The total number of claims that were submitted which met the Class Definition for the evaluation of January 1,
1957 through December 31, 1967 was 244. The number of dose reconstructions completed at that time was 180, and the number of claims for which internal dosimetry records were obtained for the years in that evaluated class was 207. The number of claims for which external dosimetry records were obtained was 192. So 192 and 207 out of the 244 cases, if that helps.

MR. FITZGERALD: Well, how many would -- are being deferred because there isn't a dose record and one would have to come up with maybe a coworker assignment? Do you have any that fall in that category?

MR. ROLFES: That's not presented in the Evaluation Report. That's something on an individual basis, as we had mentioned, you know, for example, if you expect someone such as a chemical operator, you would expect that they would have lots of monitoring data because that's a higher exposure category, we
haven't gone through to look, you know, on an entire basis of how many chemical operators weren't monitored. However, that would certainly raise some suspicions. You know, if we had a chemical operator that never had any monitoring data, we'd say probably that individual was probably monitored but we don't have his data or -- so we'd need to focus on that individual's lack of data.

MR. FITZGERALD: And that's where this goes to. You, at some point, go from dose reconstruction to dose reconstruction where you're getting the records from DOE to a point where you have to do a coworker assignment or do something like that by worker category for whatever reason, you know, the record's not there, that DOE comes back, says no record. And when it's a chemical operator or something, you're going to have to make an assignment, and that assignment is going to be based on a dose distribution for chemical
operators at Weldon Spring. And you're going to be looking at, okay, do we have essentially all the data that we need for chemical operators and how do we know that's all the data, because this one person's missing data, you have to wonder, well, do we have half the data or three-quarters of the data, or is this the exception to the rule and we have most of the data. And that's what you're going to have to answer to come up with that distribution and to make that assignment.

And this is really conventional. I think we've been up against the same issue at every site, but in this case, you know, a judgment has to be made if, in fact, the dose records are complete enough to do that distribution. And what I said earlier was, well, you know, the CER database is an epi database, but my question is whether DOE, at the time, had gone back -- or I guess NIOSH did CEDR, right -- whoever did it --
MR. HINNEFELD: I believe ORAU did CER separate from --

MR. FITZGERALD: -- whoever constructed the CER database, did they, in fact go back and answer that question, do we have everything, you know. And I'd be interested in knowing what the regime was, because certainly if it looks like a pretty systematic approach and they turned over the rocks and this is best as they can tell and lay out, that they've gotten all the data, I think that goes a long way to provide some confidence.

It may not answer Ron's question which is, okay, if you have all the data for an individual case, do you -- is there gaps. And, you know, of course, there may be gaps.

MR. HINNEFELD: I think you can probably look at one of these files, and you can see whether or not there are weeks missing or exchanges missing or if there were maybe
years with no bioassay data. I haven't looked through this whole record. There may be years with no bioassay, but then the guy's a chemical operator. That might be something we would hope to see.

MR. FITZGERALD: That's another question. So really, the central question of how you're going to assign a coworker dose.

MR. HINNEFELD: How is that -- I thought that was the question we were just asking. Now you've got this exposure from this guy. How do you know it's complete? I think you would know it was complete based on what it tells you, how many numbers you have in this record he told you, and does that fit what you would expect --

MR. FITZGERALD: Well, within an individual dose record, you would answer the question as to whether or not the file is complete.

MR. HINNEFELD: Right.
MR. FITZGERALD: I'm going to a larger question which is how do you know you have a, in a broader sense, a complete set of records that would enable you to do a coworker dose model.

MR. HINNEFELD: So in order to do something for someone that we don't get an exposure record for?

MR. FITZGERALD: That's right.

MR. HINNEFELD: Okay. I got that note.

MR. FITZGERALD: There's two facets to this, but the first one is pretty fundamental because, as you noted earlier, there has been a number of SECs awarded just basically because, you know, the database couldn't be shown to be complete enough to support coworker dose developments. You could not make that assignment with confidence, so that was an SEC.

So in this case, all I'm saying is
how do we know that we do have a complete set
sufficient that you can develop that coworker
approach. That's all.

MR. HINNEFELD: Okay.

MR. ROLFES: We've done a pretty
good job at trying --

MR. HINNEFELD: I don't think
we're going to settle it today, so I don't
know if we need to keep arguing about it
today. I'm just trying to get down exactly
what that --

MR. FITZGERALD: Clarifying --

MR. HINNEFELD: Yes, because when
you start talking about the completeness and
quality of data, and I'm staring at the
handwritten record that they kept, apparently
contemporaneously, with the guy's work, I'm
thinking I don't know what I have to do for
this. And that's what we use in this guy's
dose reconstruction, but now we've kind of
gone into a different approach of the unmarked
-- not a different -- help my understanding --
to understand that we are talking about people
where we don't get the exposure record, and do
we know we have a complete enough data set to
deal with that.

MR. FITZGERALD: That's right.

MR. HINNEFELD: Okay. If that's
the issue, I've got that in my --

MR. FITZGERALD: That's right, for
coworker --

DR. BUCHANAN: And tacked onto
that -- this is Ron -- is if you go in there
and you see that the individual had gaps that
are more than just he didn't turn in his badge
or missed a bioassay and stuff, you know,
large gaps in, say, 20 or 30 cases, you see a
lot of them have gaps that are chemical
operators or whatever who should have been
monitored, then that's going to tell you that
probably there's some data missing someplace,
that there are some handwritten files that
didn't get transferred over and stuff. Yes, their monitoring was right. Either that or the monitoring wasn't done the way it should have been.

So, you know, you have two things, two aspects. Was each individual that should have been monitored, are the bioassay records available? And secondly, is the overall population monitored enough to get a coworker base out of it? So those are the two questions that we're asking.

DR. MAURO: This is John again. By way of process, I thought I -- hear a path forward that might help to achieve closure. And it may really go to a process that whether you're implementing it or not is the question. You make your request for data for individual cases. The data shows up, and you have an ongoing process of data acquisition from DOE which probably is protracted for individual workers and also for different time periods,
1 different types of activities, different types
2 of data. So this goes on for some time.
3 While that's going on, you're doing dose
4 reconstructions for people where you can, and
5 you're trying to move out to dose
6 reconstruction. So there's a process at work.
7 What I'm hearing is there could be
8 a useful linkage between the folks that are
9 looking at the actual records for individual
10 workers, and let's say they're doing some
11 internal dose, gathering up the bioassay data,
12 and as we've all seen, there are always
13 periods of time where we don't have neutron
14 data, we don't seem to have bioassay data, or
15 we don't seem to have certain type of bioassay
16 data that might be useful or helpful. At that
17 point, typically, what happens is a coworker
18 model is either developed or applied.
19 However, there could also be a
20 trigger that says, you know something, I'm
21 noticing that we're -- for this particular
worker, we would have expected to see quarterly urine samples collected and analyzed for uranium or thorium, but we're not seeing that. And it's almost as if there's a loop here by way of process that says, you know, there probably are some records out there that we're missing.

And I'm just sort of thinking out loud now that if that's, in fact, in place, that link between your DR people who are looking at the data and trying to do a good dose reconstruction and your data capture people who are always out there trying to scour for more data, if there's a link that one helps to steer the other, that would be a process that would go a long way to providing the step that gives everyone assurance that you're really doing everything reasonable to capture data, to have a complete record. Because in the end, everyone has to feel confident that you did everything reasonable...
to capture all the data that might be useful.

And then at that point, you say, okay, really, this is all we've got, more might show up, but right now it looks like we've done the best we can.

And then you move forward from there and you build your coworker model once you find out where the holes are, and we're off and running into whether or not we've got sufficient data to reconstruct doses from this building or from this isotope whether it's neutron, beta, whatever it is.

But I think that whether you do this or not, I don't know, but it might be a good idea to use the dose reconstruction data for individual people, and when gaps show up that sort of say, look at this gap. I could see that feeding back to the data capture effort. Do you know whether or not that's done?

MR. ROLFES: John, this is Mark
Rolfes. And we have a partial answer to that, I guess. If you take a look at the Evaluation Report that NIOSH has produced, I point you to page 79, and it has Attachment 1, Data Capture Synopsis, which identifies the information that we've gone out to look for in data that we've collected, when it was completed, and how many of those documents we've uploaded into the Site Research Database.

Now something prompted those data captures, and that piece isn't necessarily there. However, we've got 13 pages of information which explain all of our previous data captures and where those data captures occurred for the Weldon Spring plant.

MR. HINNEFELD: John, this is Stu. I would offer that I know what you're describing occurs. I don't know if it occurs religiously or not. I know that there have been many times over the course of the almost 8 years since I've been working on this -- it
only seems like 18 -- that there were technical holds put on dose reconstructions from a particular site because the dose reconstructors, when trying to do the dose reconstruction, says, "Holy cow, we don't have enough information to deal with this particular kind of dose, and therefore, we need to do some site research to see if there is a way to do it." And that was called a technical hold. Claims from that site were pended, and then site research had to go see if there was a way to find information to allow that to proceed.

So I know that has happened over time. I don't know for sure how much history I can reconstruct if you're interested in seeing that. I mean that's more of a general question. It's not a specific Weldon Spring question. But I might be able to get you some stuff that kind of shows some of that.

But I don't know that -- has that
-- I mean have there been occasions when a dose reconstructor was doing a dose reconstruction, particularly at a place with not a lot of claims, and he said, "Well, I don't have this data. I will do something. I will do a model." Usually, when they do that, they try -- they get with a team leader or something if they would have to do that, if it is done. I won't ignore that it's done. If it would be done, it wouldn't be one dose reconstructor doing it. There would have to be an approach generated that would have been -- be generally useful because we try to do these things consistently.

MR. MORRIS: Ted, this is Bob Morris.

MR. KATZ: Yes, Bob.

MR. MORRIS: Yes. I wanted to add one more thing and answer a question from previous. Each site has a lead dose reconstructor, and that person has the purview

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to see the issues popping up in all of the
dose reconstructions from the sites. And I am
confident that those people would be spotting
gaps that were systematic.

But then specific to a question
that was raised earlier about the procedures
for data capture that ORAU Team worked
against, there is ORAU Team Procedure 0025.
It's called Data Reconnaissance and Data
Capture. It was first issued in July of 2004,
and it talks to the process of identifying the
available records, making site contacts with
people, and using the finding aids that are
available for the sites, and it's an iterative
process. Refer you to that for the answer to
that question about systematic approach to
data capture.

MR. FITZGERALD: I think we've
been on this quite long enough. Can we just
get back to, I think, your thought that you
would look at this issue of completeness in
the context of coworker models and all that.

MR. HINNEFELD: The notes I've taken that I think addresses what's been discussed here is one is to address the issue of for individual claims, are there holes in individual claims, you know, remarkable holes in individual claims.

We discussed doing a sampling of the Weldon Spring claims, and in going through these samples and seeing for these people and these job titles what does their exposure record actually look like. Were they monitored for external and, if so, was it complete for the years of their work. Were they monitored for internal, and if so, during what frequency during the course of their work and for what radionuclides. So we can do that and see if there is some sort of systematic omission in terms -- or even very commonly if things -- if there seem to be gaps in what you would expect to see. Okay, so we can do that.
We can also develop for -- what is done for coworkers in terms of for people in the instance where we don't get an exposure record for a person, what do we do and how do we know that's okay. So in terms --

MR. FITZGERALD: Stu, could I --

MR. FITZGERALD: But I'm not -- the process is less of -- you know, I think the process is laid out. I'm just -- my question is how do you know you have sufficient records to support a coworker assignment, in other words that you're -- you have to come up with a dose distribution that is based on a complete enough set of records that dose distribution --

MR. HINNEFELD: Okay. I'm just not familiar enough with the criteria. I think they're out there.

MR. FITZGERALD: It's a question of representativeness. Can that dose distribution that you're going to assign 95th
percentile to a coworker that doesn't have any
records, is that reliable enough and
representative enough? And the only way it's
representative is you have a complete set of
information so that distribution would be a
sound representation for that particular site,
for that particular worker category perhaps.

MR. HINNEFELD: Well, I mean this
has been discussed a number of other places as
well.

DR. MAURO: This is John. I think
that it's important that we make a separation
between data completeness in its essence, that
is has everything been done and tests been
placed on the data that we feel confident that
we've captured everything that we humanly can
capture. The second question is once you've
done that, you know, are the data good enough
to do dose reconstruction, to build coworkers,
do we have SEC issues.

So I'd like to stick just for one
more moment to the first step. I heard three lines of attack that could be used to document that you were, in fact, thorough in making sure you've got all the data. The first is the one that you currently already do very well. You make a major assault on all the record centers, and you go out there and just scour, but it's really like just going, making sure if there are records on Weldon Spring someplace, at the Hanford's record center, we're going to go look for them.

The second piece has to do with Dick Lemen's point, roster information. I don't know how productive that could be, but that's another line of attack. Say, listen, we have information on the rosters of all the people that have worked there over this 10-year period, and is there any way knowing that roster that we could pose questions to the data that we did gather that seems to be -- seems to indicate it. It's never proof but
it's weight of evidence that we really did get most of the people that probably should have been -- that were on the roster and perhaps should have been monitored for something that is important to them. That would be another weight of evidence. So that's a roster concept.

One is the assault. The second is a roster. The third is holes in individual workers' records themselves. That would be the third leg of this stool that we're trying to build to stand on. The third leg would be, okay, when we look at the actual records for the people that we do have records for that have been provided by DOE, and our dose reconstructors are looking at it, and as you said, your lead dose reconstructor would be the person that would start to see something emerge, my goodness, it seems that we're missing a lot of data on this particular time period, this particular category of worker,
this particular process, et cetera. Probably should have seen some more bioassay data here. Maybe it's just lacking and that's that, but maybe it exists and we haven't found it.

So what I'm getting at is that I almost -- form in my mind while we've talked is a three-step element that makes up a process that when documented in your Site Profile or your ER report, will communicate to the world the things that you have done to be due diligent in making sure that you've captured the records that were out there and that you did the best you could.

Then you leave that subject and then you move on to the subject that Joe just mentioned. Okay, now that we feel pretty confident we got everything that's out there, now we have to ask ourselves the question is that data good enough to do the things that need to be done. And, of course, that's another subject altogether.
MR. FITZGERALD: Well, you know, listen, the SEC is a very specific set of inquiries, and the question is whether or not the data is complete enough to support dose reconstruction in the sense of a coworker model development. I mean I think we're conflating this by including things like due diligence and, you know, whether a good faith effort was made to turn over as many rocks as possible. I mean those are all worthy objectives, and certainly we take that at face value that, of course, NIOSH is going to be aggressive and look for paper. I don't think that's the central question.

Central question is whether you can demonstrate that your set of records is sufficiently complete to support dose reconstruction. That's the central question for the SEC, and there are two questions that are embedded in that. I think, Stu, you've written them down. One is for any individual
record, how confident are you that there is not gaps that can't be filled. You know, that's one question.

The second question is at some point, you're not going to necessarily get a dose record back from NIOSH in a claim. You're going to have to turn, if it's a worker category that clearly should have been monitored, you're going to have to turn to a coworker assignment. How are you going to do that? That's a very specific question. How are you going to do that and on what basis?

And that basis should include an assessment of the completeness of the records that would enable you to construct a dose distribution for those worker categories, maybe time periods, too, to be able to then take that value, maybe 95th percentile, and assign it to that worker that doesn't have a dose record, which is, of course, SOP for all the sites that we've been up against.
If you can't do that, the records aren't complete enough, the data is not there, that has been a basis for an SEC award in the past. So very specific to those questions, you know, I think there needs to be some treatment by NIOSH on that to enable the Work Group to feel confident that, okay, that issue, which is central to the SEC, we can certainly answer that from a completeness and adequacy standpoint. You know, the data completeness and adequacy, I think, is a foundational question. Before you go any further, is the data there that would enable you to do that? That's pretty much it.

MR. HINNEFELD: Those are things at least I can understand.

MEMBER LEMEN: Hello, this is Dick Lemen again.

MR. KATZ: We can hear you, Dick.

MEMBER LEMEN: To follow up on my previous questions, I think this is relevant...
to the discussion right now, you said on the table that you have 244 people that meet the Class Definition.

MR. ROLFES: I'm pulling the table back up, if you could give me just one second, please. That's correct.

MR. KATZ: Dick, are you still there? Dick, we can't hear you anymore. You cut off sort of suddenly. I don't know if your line broke or -- we've lost Dick. It sounded like it cut off, and he's not responding.

MR. ROLFES: I guess I've answered his question.

MR. FITZGERALD: Moving on.

MR. HINNEFELD: Well -- recollection we were around 200 out of 244 was the number, so five sixths of the people in the covered period have monitoring data. Now that does not speak to the question, Ron's question, "Well, is it -- are there big holes
in that? Is there any pervasive holes in
that?" I mean so there is --
MR. KATZ: It doesn't answer
whether they all needed to be monitored
either.

MR. HINNEFELD: Well, in fact,
that's true. I mean there could be 40 people
who had administrative jobs -- I don't know
what Weldon Spring's monitoring regiment was.
I don't know when they chose to monitor.

DR. BUCHANAN: This is Ron with
SC&A and, yes, they -- none of -- most of --
MEMBER LEMEN: Hi, this is Dick
Lemen again. I got cut off.

DR. BUCHANAN: Okay.

MR. KATZ: Welcome back, Dick.

MEMBER LEMEN: I understand you
didn't want to hear my question.

(Laughter.)

MR. KATZ: We actually didn't -- I
think you cut yourself off, Dick, because we
MEMBER LEMEN: No. I know I cut myself off. I don't know how I did it, but I did it. But anyhow, back to my question which I think is relevant to this discussion, there are 244 people that meet the Class Definition according to the table.

MR. ROLFES: Correct.

MEMBER LEMEN: And if I read the report right, that table came from, there are nine buildings. Are those nine buildings all included in the Class Definition?

MR. ROLFES: It's the entire site, that's correct.

MEMBER LEMEN: And throughout the nine buildings, you have further in that broken down to ten job categories, correct?

MR. ROLFES: Could you point me what page you were referring to in the Evaluation Report?
MEMBER LEMEN: Table 6-7. I don't know exactly which page that's on, but that's the table I'm looking at.

MR. ROLFES: Okay, I'm there.

Thank you.

MEMBER LEMEN: And my question is of the 244, have you broken it down -- I didn't see it in the report, maybe you did and I missed it -- have you broken down how many of those 244 fit into the nine buildings and was there a lot of interaction between moving from one building to another during the work process? And the next question is in the ten job categories, how did the 244 fit into those ten job categories? Is there a sort of a preponderance, say, in -- do you know how many worked in each job category to start with? And then what percentage of the 244 represent each job category? Do you follow what I'm saying?

MR. ROLFES: I understand what
you're asking, and that's not something that we've done. That's something that is sort of done on an individual basis. We look at the individual's exposure history and work locations in order to assign a claimant-favorable distribution for the energies to which the individual was exposed to, for example, whether it's 250 and above keV photons or 30 to 250 keV photons. We usually try to look at the buildings that the individual is working in and make a good judgment as to the radiation energies that he was exposed to.

MEMBER LEMEN: The question I'm really getting at is is there any -- in the ability to do reconstruction, are there any buildings that are really under represented? And secondly, are there any job categories that are really under represented?

MR. ROLFES: We haven't broken down a stratification of the monitoring data
by building, by job category if that's what you're referring to.

MEMBER LEMEN: Those two questions seem to me to be key as to completeness of data sets. That's all I got to say. I'd like to see that breakdown --

MR. KATZ: That garbled --

MR. HINNEFELD: He's saying he'd like to see that --

MR. KATZ: -- if possible.

MR. HINNEFELD: I don't know.

We'll have to go find out. I don't know if we have enough information to do that or not.

MR. ROLFES: Don't know if we'd be able to from an individual's exposure record. In order to do that, we'd have to have that building reported with each individual exposure history. And when we complete a dose reconstruction, we don't need to know what building an individual is in if we have the badge data and their bioassay data.
MEMBER LEMEN: But doesn't the dose -- doesn't the job category have an important role as well as the building?

MR. ROLFES: Well, in establishing monitoring criteria for individuals, it does. However, in our program, it doesn't necessarily. If we have monitoring data, for example, for -- well, I guess it depends. For example, if we would see a chemical operator that had no monitoring data, that would certainly be important. However, if we have a chemical operator that has, you know, plenty of external and internal bioassay data, knowing what job category or building they were in and when they worked in this building or that building is not going to be important in the dose reconstruction process. We usually apply claimant-favorable assumptions based upon our Site Profile in order to interpret that individual's records.

MR. HINNEFELD: This is Stu. I
think, Dick, where you're going, and I'm not sure that the program follows, but I think I want to understand the question and see what's possible and how we go with this. Where you're going is that you're looking for just the data that we have sufficiently representative of not only building location but also of job title --

MEMBER LEMEN: Absolutely. You said it better than I did.

MR. HINNEFELD: Okay. And so I'm not 100 percent sure what we can do at Weldon. I'm not 100 percent sure, you know, what we can do at other sites as well on that. It has to do with how well we can reconstruct an individual's work history essentially because the data are going to be linked to an individual.

And so we would have to, for each individual, track their job assignments and sort of put them in a category by year.
depending on what job they held that year, and then put them in a building by -- based on my experience, I suspect there will be job titles that will never be specific to one building but rather will be working throughout the plant, and maintenance is the obvious answer. Very few places that I am aware of would have kept a maintenance staff that worked in Plant 4 and no one else ever went into Plant 4. You know, millwrights would work where a millwright was needed and whatever building that was in, by and large. So that would be my expectation at least.

So I think there would be some job titles that would be distributed. You know, their work experience would be distributed among the site, and there are some job titles, I would suspect, for some period of time would be restricted to one building. I would think a chemical operator probably was assigned to a specific chemical process and worked on that.
until the workload required that he move and
do something else or until a more desirable job opened up that he could bid out to. This is my experience from a very similar plant is that's how things worked.

So that's -- it's a fairly complicated answer and even if it -- even to simplify it, I'm not so sure we have the information that would allow us to do it, but I'll see what we can do.

CHAIRMAN GIBSON: This is Mike. It seems to me that Dick's question has everything to do with you being able to verify that you have sufficient data to do coworker modeling.

MR. HINNEFELD: Well, I mean this is going to be a broader question in terms of coworker, and I don't know if the Board's getting ready to take that up or not. I see coworker is on the Board's agenda for the February meeting, a coworker presentation.
Coworker approaches, as we have generally done them up to now, provide essentially -- treat the population of the work site as the coworker, and for those categories of workers who are heavily exposed, they receive an exposure typically of the most -- that we would judge be heavily exposed. They would get a percentile of the population distribution, of that exposure distribution that equates to among the most highly exposed in the monitored population.

For people who are intermittently exposed, for instance, I don't know what the examples we would use, rad tech maybe, maybe a transportation worker, who are in the work areas but not dealing with radioactive material all the time would probably receive a somewhat less level on that percentile.

And administrative workers would receive probably receive an environmental dose or a lower percentile of the monitored
population.

Now I'm only speaking here about people who are not monitored who fit into those categories. That heretofore has been the standard coworker approach, and when you start -- and the reason for that is that when you start subdividing your worker population the various ways you can, I mean you can slice and dice this worker population on more ways than just this, on job title and building, you end up with vanishingly small populations to try to draw a coworker distribution from.

And so you are essentially starting out trying to achieve something that on the face of it, you're not going to be able to achieve because you won't have the data in sufficient quantity to fill all these niches.

So that argument has occurred. That discussion has occurred. I don't know that there's been any resolution to it.

MR. FITZGERALD: Going back to
Dick's comment, I mean, and what Mark was saying earlier, one approach would be simply chemical operators, a pretty central -- you know, there's enough population in there --

MR. HINNEFELD: I would think there would be.

MR. FITZGERALD: -- think there would be. I would say, okay, for chemical operators, how many rostered chemical operators did you have at Weldon --

MR. HINNEFELD: -- your question of --

MR. FITZGERALD: -- versus how many files, how many dose files did DOE --

MR. HINNEFELD: That depends on finding roster information.

MR. FITZGERALD: Well, as I'm saying, you know, then you compare it against how many individual dose files do you have against that, and if you had 98 percent of the rostered chemical operators who you had dose
files for, I think your distribution's going
to be pretty sound. You could use it to
assign that one or two that are missing a dose
record, just, you know, a coworker dose
without too much qualification. But if it
turns out there's 85 chemical operators
rostered, you have dose files on 40, then I
would say, yes, problem, because you don't --
you know, if you're looking for the 95th
percentile, something up there, you don't know
if you've captured it because you're missing
half your records.

MR. HINNEFELD: That I certainly
understand where you're coming from, and I
don't object to it. You know, it's one of the
things that I've noted here that we're going
to try to do. I'm just feeling that -- and if
we went with chemical operators and maybe a
couple of other heavily exposed populations
where you would expect they should have
monitored these people, and you should have a
fairly complete set, I would think that we could do that.

Now when you start going down -- especially when you start bringing out maintenance crafts --

MR. FITZGERALD: I agree with --

MR. HINNEFELD: -- you're going to break down a millwright from an electrician from a pipe fitter from whatever else, you're going to have vanishingly small populations.

MR. FITZGERALD: It's population driven. Otherwise, the statistics get a little funky, so I don't disagree with that either.

MR. KATZ: So are you saying, Stu -- I just want to be clear about something. So are you saying, Stu, you can -- since you don't hold all these records, you only get the records as you get claims --

MR. HINNEFELD: Yes.

MR. KATZ: -- but -- so are you
saying that if you can get a roster, you can also go to DOE and ask them for all of their information on all chemical operators for Weldon Spring, or what have you, whatever the bin might be?

MR. HINNEFELD: Well, whatever we're going to use for a coworker, you know, if we're going to have a coworker approach, whatever we are going to use for coworker, we would have to demonstrate is sufficiently broad. And so as a general rule, if we have 250 or 240 claimants and there were how many people worked at Weldon Spring over the 15 or 20 years it was open -- I guess a little less than that -- that 250 claimants we have may not be a very complete set. So the actual exposure -- building a database out of the exposure responses we got may not be appropriate. I don't know. We'd have to take a look at it.

But on the other hand, if, for
instance, a CER database -- should be relatively complete in terms of the workers there, I would think. If you were going to use something like that in a coworker, and I don't know, I'm not saying we're doing that, but if you're going to do something like that, that you would compare that to some sort of rostering for completeness on that.

Whatever you're going to use for this coworker is what you have to demonstrate is sufficiently complete and sufficiently representative. That's what I'm saying.

MR. KATZ: My only question was whether you have access to the denominator -- whether the DOE can pull all that up.

MR. HINNEFELD: I don't know.

MR. KATZ: It sounds like it's hard copy. I mean it seems like --

MR. HINNEFELD: I don't know --

MR. KATZ: -- that would be an enormous effort for them to respond --
MR. FITZGERALD: Yes, and that's where I was throwing out the possibility that they did do that for CER. I don't know but --

MR. HINNEFELD: I don't know and --

MR. FITZGERALD: -- and it is a lot of work.

MR. HINNEFELD: It's generally not universally true that we know the roster of the workers or even the total number of workers.

CHAIRMAN GIBSON: So it sounds like to me then for issue one, what we need to have at the next meeting and hopefully maybe satisfy SC&A and maybe close this, is DCAS is going to find out if there was any V&V done on the CEDR data, and also DCAS will present what information they have to show that they have sufficient data to generate coworker dose models. Is that --

MR. HINNEFELD: Yes. And then the
other thing we said was that we would take a sampling of the responses that we got and do some sort of evaluation of whether there are pervasive holes in what should be there or just, you know, maybe on occasion, you know, somebody failed to turn in a badge --

MR. FITZGERALD: And you'd have to design that to some extent so it's a random over maybe several years, you know, just different years.

MR. HINNEFELD: Yes. We would want to sample -- I'm sure there are sampling strategies that people who are smarter than me can think up and the size of the sample and everything be dictated by the number of claims.

MR. FITZGERALD: But going back to what Ted was saying, yes, I think maybe the biggest challenge will be whether or not, you know, if it's all hard copy, whether you can get that denominator --
MR. HINNEFELD: Yes, whether the denominator is knowable is an open question. I don't know if we --

MR. FITZGERALD: But that sort of opens the door to well, at some point, you may have to open that door and how would you do it in this case. And I don't think there's an easy answer. Maybe one possibility, as Mike was pointing out, that they, keep your fingers crossed, did something similar on CEDR, and that might be a big step forward. If they didn't do it, then nobody has actually done it at Weldon Spring, which is a real question mark.

MR. HINNEFELD: Yes, if CER -- they may have made some statements about that. When they built that database, they may have made some --

MR. FITZGERALD: They may have gone back and done exactly this, said, how do we know we have all the chemical operators.
MR. HINNEFELD: Since that was done for epidemiology, I would think that they would be looking for essentially the entire population. They would want to try to find out.

MR. FITZGERALD: They would want to make sure they had everybody.

MR. HINNEFELD: Yes, who do we -- you know, who's in this study.

MR. FITZGERALD: How do they find out if they had everybody.

MR. HINNEFELD: Or if they can't get everybody, I guess, they would -- they could do their study on the monitored population. I don't know.

DR. BUCHANAN: Okay. This is Ron. I'd like to move on. I did have a couple of clarification questions.

MR. ROLFES: Can we take a quick break before we --

DR. BUCHANAN: This is just to
finish this off.

MR. ROLFES: Can we take a quick break before we carry on, please?

DR. BUCHANAN: Okay.

MR. KATZ: Okay, wait. So, yes, we've been going on for almost two hours straight, so Mike is right, a 10 minute break. I don't have a watch on to tell what time it is right now.

DR. BUCHANAN: 10:51.

MR. KATZ: So about a little bit past 11, we'll get started again. I'm just putting the phone on mute, folks on the phone.

(Whereupon, the above-entitled matter went off the record at 10:50 a.m. and resumed at 11:01 a.m.)

MR. KATZ: Let me just check and see that we have our Board Members on the line. Dr. Lemen and Mr. Presley?

MEMBER LEMEN: Yes, I'm here.

Ted?
MR. KATZ: Yes, hi. Thanks, Dick.
And, Bob, we have you, too?
(No response.)
MR. KATZ: Okay, no Mr. Presley right now. Anyway, carry on.

DR. BUCHANAN: Okay. This is Ron from SC&A. I just had two clarifying questions, and then I think we need to move on. Mark, when you said that there were 244 claims that met SEC at Weldon Spring and 207 had internal and 192 had external monitoring, now this, are you saying they were complete records, or if they had one point, one badge or one bioassay, it was counted as having -- do you know the details just briefly on that?

MR. ROLFES: Well, if they have external monitoring data, that would have counted as one. We don't look to see how comprehensive that data set is. Some employees, you know, there were some people that only had a few weeks of employment. You
would only expect to have one point. Other people might not have had any because they might not have been a radiation worker. But within each individual case, that's not something that we've done for the SEC evaluation. We've just generalized or summarized the information.

However, on the dose reconstruction process, we do go through each claim to make sure that the data is complete and look to -- check to make sure that there is enough information to do a dose reconstruction there.

DR. BUCHANAN: Okay. Thank you. The other point I'd like to make is this is -- matrix issues number 1A, C, and D. A and C was the internal and external data verification. C was the coworker model, and I think that we have spent enough time on that. I would like to emphasize that the coworker model is necessary.
From what I understand, the ER, when we get into the environmental section, there was a lot -- in the Site Profile review, there was a lot of environmental monitoring issues, and according to the ER, that they planned on using the workers' exposure to limit exposure to people that might not have been monitored from environmental exposure, and that that would cap -- limit -- would bound their exposure. And so the coworker model would be important if that's going to be used to bound the unmonitored person either in the workplace or in the environmental.

So with that, I'd like to move on to issue number 1B, which is the daily weighted average alpha concentration. Now I'd like to get a little bit of history on this.

The issue was that in the ER, they presented some hair sampling data for uranium and thorium, and if I remember correctly, said that that could be used for limiting exposure
for SEC purposes. And so there wasn't a whole
lot of detail, but I believe that was the gist
of it.

And now the daily weighted average
of alpha exposure measurements has been an
ongoing issue at Fernald. And so we didn't
want to waste resources on recovering it at
Weldon Spring just yet. And so what SC&A has
done was since Weldon Spring received this
material from Fernald, we wanted to work with
the Fernald and see its outcome before we
apply that directly to Weldon Spring or NIOSH
applies it to their details at Weldon Spring.

I want to get a little bit of
background on that so that you know where SC&A
is coming from on that. At Fernald, in
February of 2002, NIOSH issued a Fernald DWE.
That was Morris reference 2009. We discussed
this a little bit at the last Weldon Springs
meeting. I need to go down through this list
of documents at issue so you see where we
stand today.  

In July of 2009, SC&A issued a White Paper concerning the use of DWEs for the Fernald site. And then we had our meeting here on the 19th of October 2010, and that was discussed at that meeting, and SC&A was tasked to look at that for Fernald and extrapolate it to Weldon Spring.

November 2010, NIOSH issued Revision 3 of their White Paper for Fernald, and that was too late for SC&A to include that in their response to NIOSH's Revision 2 that came out earlier. It came out about the same time. And so SC&A, what they did, they reviewed NIOSH's Revision 2 and 3 in light of Davis and Strom's 2008 Health Physics article. And in December of 2010, they issued a report using Revision 2 of NIOSH's paper. And I talked to the head of that task, and they plan on taking NIOSH's Revision 3 into consideration and reissuing that now that they
have that in hand. That was planned on being
done in February. I contacted them recently,
and they said they weren't sure when it was
going to be issued, but in the near future.

So for Weldon Spring, what SC&A is
doing is waiting on that revision from SC&A's
paper evaluation of NIOSH's Revision 3 and
then look at that in terms of Weldon Spring.
And so, of course, NIOSH will want to look at
that Revision 3 reply from NIOSH and see how
that affects their plans for their ER at
Weldon Springs. And so that is pending really
at this point.

MR. FITZGERALD: Maybe I missed
it, but putting in perspective the White Paper
that we did present, the Stiver-Chmelynski
paper that was dated November, how does that
bear -- I mean it's not up to date, or is that
two different things?

DR. BUCHANAN: No. And, in fact,
I think we're coming to some sort of an
agreement as NIOSH has went back and re-
evaluated their position in light of the Strom
& Davis article of 2008. And I think SC&A is
in agreement except for two points or so. I
don't want to speak for the author of it, but
I think we're coming to an agreement.

MR. FITZGERALD: So the paper that
was provided in November that NIOSH now has
from us is going to be tweaked based on
Revision 3 --

DR. BUCHANAN: Right.

MR. FITZGERALD: -- but it still
embodies a lot of the issues that we're
concerned about relative to the Strom paper?

DR. BUCHANAN: Right.

MR. FITZGERALD: Okay.

DR. BUCHANAN: And so it appears
that SC&A's first read of NIOSH's Revision 3
looks like we're coming to very much of
agreement except for a couple points they're
going to point out.
DR. MAURO: Ron, this is John. I spoke to John Stiver this morning about the status of that report since we are also getting ready for the Fernald meeting. And we expect to have our new White Paper on this issue coming out, ready to go out toward the end of this week, early next week, along with some other White Papers, and that will address this issue certainly as it applies to Fernald, but, as you've mentioned, it has direct applicability, the technique that was developed. And in talking to John, we've come a long way to achieving closure on most of the important issues, but that's -- there are still a couple of things we do need to talk about. But we will have our draft Fernald report out real soon, and I think that should help out here.

DR. BUCHANAN: Okay, thanks, John. And, John, make sure that Mark and Stu get copied on that when it's appropriate if you
would.

DR. MAURO: Very good.


MR. KATZ: Yes, Bob.

MR. MORRIS: I have a question.

John just referred to the draft report. Do these reports ever get marked as non-drafts?

DR. MAURO: I guess the answer is -- all our reports -- maybe I can help a little bit with SC&A's reports.

MR. MORRIS: Okay, please.

MR. KATZ: Yes. SC&A reports go out for use in these types of deliberations that we're having right now, and there was a question that came up many years ago on do we try to then, as we move through this protracted process, like we're having now and that we will have in the future, try to somehow in the end finalize one of our reports and say it's a final report. And it was determined that it was impractical because of
the protracted nature.

The record that we are forming right now on the transcript and the matrix that we issue represent the documentation of the status of issues resolution regarding all of our reports. So our written reports, as they are put up on the web and as they're distributed to all interested parties, remain in draft form in perpetuity. And it is only the record that we are forming right now that will allow a person to see how -- and the matrix, which makes that a little easier -- how, in fact, the status of issues resolution and how, in fact, they ultimately were finally resolved.

I believe eventually, of course, some decision is made and judgment is made by the Board on, let's say, an SEC-related matter. And, of course, therein lies the end of the process when that recommended -- recommendation is made. But unfortunately,
no, we do not try at that point to say, okay, let's revise our report. It's just not practical. And I believe, Ted, you were part of that conversation we had some time ago. Now do you feel that I characterized that properly?

MR. KATZ: This is correct, and I guess it's unfortunate. Up front and when this all got started, they probably should have just been called working papers. That's really what they are in a sense, working papers for the Board, and that's why, you know, in this other construction, they're called drafts, but they're working papers. But they move things along, but the Board's the one that's the actor in this process at the end of the day.

MR. MORRIS: Okay, thanks very much.

MR. HINNEFELD: Yes. Bob, this is Stu Hinnefeld. If it relates to knowing what
to prepare -- what to use in preparation for these meetings, any product that SC&A delivers to the Advisory Board or a Working Group or a Subcommittee of the Advisory Board, they also copy us on those deliveries. And that is their contribution to the discussion. Whether it says draft or what it says, you don't worry about that. That's their contribution to the discussion, and that's the issues that we are to respond to or deal with. Okay?

MR. MORRIS: Excellent. Thank you.

DR. BUCHANAN: So let's move on to issue number two in the matrix --

CHAIRMAN GIBSON: So just a minute. What was -- so what did we decide here about the use of the daily weighted average? Was --

DR. BUCHANAN: Okay. In SC&A's response that will be issued next month to NIOSH's Revision 3, that will be sent to Stu
and Mark to evaluate, and I will receive a
copy and evaluate it and see if there are
issues left at Weldon Spring or if we have
reached agreement on it.

CHAIRMAN GIBSON: Okay. So we'll
have an answer to that at the next meeting
then?

DR. BUCHANAN: Right, we should
come to the next meeting either in agreement
or hash out --

MR. ROLFES: That's assuming that
we resolve it at Fernald.

MR. KATZ: So, Mike, there will be
the SC&A contribution that's coming out that
John mentioned, and there will be ultimately a
NIOSH response to that out of the Fernald.

MR. FITZGERALD: And it's being
done for Fernald, and we're taking advantage
of that discussion for Weldon Spring, so to
some extent, what Mark was saying is it's
going to be debated at Fernald, and then we'll
have to figure out whether there are issues that are specific to Weldon.

DR. BUCHANAN: Hopefully, it's a little simpler at Weldon, so it should trickle down. That's probably wishful thinking.

MR. KATZ: It's good thinking I think.

MR. FITZGERALD: Is that sequence going to work out? Is there a Fernald Work Group meeting before --

MR. KATZ: Yes.

MR. FITZGERALD: -- coming up.

MR. KATZ: -- one coming up.

MR. FITZGERALD: Okay. So that should work out then.

MR. ROLFES: About two weeks away?

MR. KATZ: Two or three weeks away, yes.

MR. FITZGERALD: All right. So that'll be on the table --

MR. KATZ: Yes, so the quicker we
can get that Fernald paper, the better, John, for DCAS having time to consider it for this Work Group.

DR. MAURO: Yes. I think it's going to go out -- this, that and others are going out this week.

MR. KATZ: That's great.

DR. MAURO: So we're in good shape.

MR. KATZ: Thanks.

DR. BUCHANAN: Okay. Are we ready to move on to Issue 2?

CHAIRMAN GIBSON: Yes.

DR. BUCHANAN: Okay. Issue 2 in the matrix was the lack of personnel contamination and egress monitoring. And this consists of -- at Weldon Spring, they did some bioassay and they did some external monitoring as we briefly discussed. However, there was some contamination monitoring within the immediate work area where they handled the
uranium. However, back in the 50's, uranium was considered a chemical hazard and not too much of a radiation hazard, more of a chemical hazard. And so it wasn't controlled like you would see it in later years and today.

And so they did not have any portal monitors or hand monitors or anything like that as the workers left. And so of concern, especially in interviewing the workers, was that there was material that was in unwanted places outside the operating area, in the cafeteria, in the parking lots, on cars and stuff, and the workers left without monitoring themselves to much extent at all. They were required to wear some sort of protective clothing, and showers were available if they wanted them.

It wasn't a set rule that they had to shower before they left. And so workers could have left with the uranium in the creases and on their hands and stuff and
transported it to the other places not considered contaminated at the work site and also in their automobiles, in the home and stuff. And so even if they showered, a lot of this material could have stayed in the creases around the neck in the folds and stuff.

And so we are concerned that there wasn't any egress monitoring, and the last time we discussed this at the meeting, there was indication that this was a general problem at some of the other sites, too, and that NIOSH is going to look into how it was addressed at other sites.

MR. ROLFES: Yes, that's correct. I think Jim and Stu had agreed to take a look at that as a general across the complex type issue. To give you an answer specific to what we would -- you know, try to bring it to Weldon Spring plant. For example, I just drafted this and had these thoughts in my mind, so I just wanted to relay those as some
working ideas, I guess.

You'd have to take a look to see what the probability that only the individual's skin was contaminated because if an individual was heavily contaminated, it wouldn't just be his skin that was contaminated. His badge would also be contaminated as well. So if an individual showered at the end of shift or when they got home, they'd wash the majority of that contamination off if any was present. However, the badge, if the badge was contaminated as well, wouldn't be washed. So the badge would continue to be irradiated by the uranium deposited on it. And that would have triggered something when the badge was developed, and you can usually identify a contaminated badge. So you'd have to take a look at some specifics.

The other thing to consider would be what is the chance that that individual had
contamination on their skin and then was subsequently diagnosed with a cancer in that exact location where they had that skin contamination. So those are some of the things that you have to take a look at, the records that we have for individuals, individual statements. Those are some of the things that we do, in fact, look at in the dose reconstruction process.

It's usually also the direct radiation from working with hands-on radioactive material that would contribute the greatest majority of the individual's exposure that they received on their film badge or to their body rather than contamination. A contamination dose is not very significant from uranium just because of it's low specific activity.

MR. HINNEFELD: I guess the bottom line though is we owe a written response.

DR. BUCHANAN: Okay. And will
provide it. Okay, issue number 3. If there are no questions on 2, we will pursue further information how NIOSH wants to handle that on issue number 2.

Issue number 3 is the lack of information for workers during 1967, and that's the reason I set the stage a little earlier on what happened at the site is that it closed down December 1966. It was pretty much idle for a number of years, 1967, perhaps '68, but the SEC goes through '67, so we'll just talk about that.

There was no -- I could not find any internal or external monitoring data for '67 for people that worked. According to their documents, they worked through '67. I think I found five individuals and could not find any data for '67 that they were monitored.

This was kind of a different situation in that it wasn't production and it
wasn't D&D. The Army had a contractor tear up
some of the bricks. And the facilities where
a worker could have been exposed, we have
several interview reports on that and that
there just wasn't any records. And so what
they were going to see -- I think last time
the action item was to check with DOL to see
who was legally responsible for the site in
1967.

MR. ROLFES: We said that we would
provide documentation showing the transfer
dates. We believe we had found a document
that showed it was officially transferred in
August of 1967, so we still owe SC&A that
document.

Also, looking at the number of
claims that we've received, I went back
yesterday and looked at the number of claims
in the NIOSH OCAS Claims Tracking System that
had employment during 1967 at the Weldon
Spring plant, and there were 17 cases that had

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employment. Of those 17, some might have had just a couple of days of employment in 1967; others worked the entire year. So, yes, we do need to check with the Department of Labor to determine whether it's a covered facility and when the exact cutoff date is.

But taking a look at those 17 cases that I had identified, 15 of those were compensable already. So it comes down essentially to the employment for two cases, and that's where we stand at the moment.

DR. BUCHANAN: Okay, thank you. Issue number 4 in the matrix is the radon and thoron determination for both monitored and unmonitored workers. And a little background on that is that most of the material, if not all the material used at Weldon Spring was ore concentrate, which means it did not have a lot of radium in it like the material at, say, the downtown St. Louis facility had. And so there was no -- thought that there was no need to
monitor for radon, and when thorium was used, they did not monitor for thoron gas.

And so the proposed method in the Site Profile and, I think, in the ER, too, is to do a calculation using the throughput and the probability of emission of radon from what radium might be present, and then do a calculation assuming that the indoor intake to the workers in the building did not come directly from the material, but it was exhausted outside, and then use a simple dispersion model outside to calculate the amount of curies released and the concentration, and then the inside concentration was equal to the outside concentration with a slightly larger equilibrium factor of .5 instead of .3.

For the thorium, when it was used in `63 forward, there was a similar type of model set up, but the calculations weren't actually done. It gave the parameters that
And so SC&A found that there was no measured values. We did look at the downtown facility. There was a measured value down there showing that the indoor concentration was about four times higher than the outdoor concentration, and these aren't identical facilities, but it is the indication that perhaps this isn't a good assumption. And so we have an issue over the radon and thoron method used in the ER.

MR. ROLFES: The important thing in your comparison is you're comparing apples and oranges, and you've got to take a look at the Destrehan facility, the indoor measurement where they were handling a large radium source term is completely different than the Weldon Spring plant where they're only handling ore concentrates where the radium was stripped down. So you wouldn't expect to have elevated air concentrations at the Weldon Spring...
facility as you would at the Mallinckrodt facility. There's a different source term at the Mallinckrodt facility than there is at the Weldon Spring facility.

DR. BUCHANAN: I agree, but when you got radon, regardless of where it comes from, it all comes from the radium. And the intensity may be much greater at the Mallinckrodt facility I realize. I agree with that. But I'm just looking at whether the equilibrium would be similar just to say is it a good assumption to assume that the indoor concentration is equal to the outdoor concentration and that very little escapes from the process to the worker inside. That's the assumption made is that the workers working at the vat or whatever, they got a hood over it, it sucks it out, and that none of that comes back to the worker -- or noticeable amount comes to the worker. All that comes back is what is sucked into the
building from the outside. And the main
problem is there were no measurements to
benchmark it with. And so we feel that the
radon and thorn method used in the ER and the
TBD just is not sufficient to be showing that
it's technically reasonable.

MR. ROLFES: Okay, technical
reasonability versus claimant-favorable and
bounding, we presented the bounding analysis
in our Evaluation Report, and we feel that it
is defensible based upon the source term data
that we have. It would certainly be nice to
have additional data to validate it, but this
isn't something, you know, outside of what we
would normally do. I don't know if there is
anything else that maybe Monica or Bob might
have to offer on the discussion.

MS. HARRISON-MAPLES: No. I don't
have any further thoughts.

MR. MORRIS: No. I don't have any
other significant comments. It's a model
distribution, and I agree, though, with Mark that using the Destrehan facility as a reference point is sort of arbitrary. It had a different process going on. Other industrial buildings might be better candidates for a comparison, some that didn't have significant radon source terms in them if that's necessary to come up with another comparison.

MR. HINNEFELD: This is Stu. I guess I'm still at the same place I was at the last Weldon Spring meeting. I don't understand yet why radon is an issue if they didn't ever get ore, if all they got was uranium concentrates. I mean is there any data out there on radium concentration in uranium concentrates?

MR. ROLFES: I'm sure we can pull some out of a mill, you know, from the Western United States, but --

DR. BUCHANAN: This is Ron, and I
agree, and I wasn't trying to equate this to the downtown facility. I was just trying to use that as an example because there wasn't any measurements made. But perhaps a better way to approach it would be is there a facility that handled ore concentrate that did any radon measurements within the DOE complex at any time. I don't know.

You know, this model is a paper model that describes something, but we have no way to check it. Usually, you want some sort of benchmark to show this is true, and if we could find another facility that did at least a few radon measurements and say, yes, this is an overkill or it's reasonable, it would be a better deal. But the way it is -- and the dispersion model, I'm not a dispersion model expert, but according to those I've talked to is that using a simple dispersion model around buildings is not a viable technique.

And so I would just like to see
some sort of stake in the ground saying that
this is a reasonable method to use by
comparing it to something else that's similar.

MR. MORRIS: Excuse me. Robert
Morris. With regard to the atmospheric
dispersion modeling, we took some very
conservative factors to make the assumptions
that went into the model, which I think would
certainly overwhelm any wake effect from
buildings. So, you know, I think the model
stands as written, and let's just see if you
can find a reason to think the building wake
effects that you're suggesting would be
overwhelming of the conservative assumptions
that we put in.

MR. HINNEFELD: This is Stu. Help
me out here. What did we do? What were those
conservative assumptions that we used to --

MR. MORRIS: Well, we assumed
pessimistic dispersion factors in terms of,
say, the offsite -- or the fence line doses
coning back into the center of the plant, and we used factors that are modeled out of recent NRC documents in terms of the dispersion factors themselves, the tabular look-up data. So we went back to nearby -- data from St. Louis and came up with relatively pessimistic assumptions about the atmospheric dispersion.

DR. BUCHANAN: This is Ron. We're talking about the radon coming from the process building, the stack at the process building and determining what the concentration was by throughput and the amount of radium that might have been present in the decay of radium into radon and its equilibrium and how much would have went out the stack and then -- but the dispersion would have been around that building and then drawn back into the facilities where they worked. Now this didn't go out to -- unless I'm wrong -- I don't recall this being a parameter of the site --
MR. MORRIS: So you're saying about the intake back into the building? You're not talking about the fence line calculations we made otherwise?

DR. BUCHANAN: Correct. I'm talking about what's taken back in to the workers.

MR. MORRIS: I'm sorry. I moved on to a different topic that was closely related, but --

DR. BUCHANAN: Right, in the environmental.

MR. MORRIS: Right.

DR. BUCHANAN: No. I'm talking about the workers that were exposed inside working close to the material where there wasn't any radon measurements, and so they used this model instead.

DR. MAURO: This is John. I've looked at lots of radon issues, as you all know, for various facilities here and this
issue of releasing radon in the stack. Let's call it a stack at the top of a vent on a building. And, of course, on many occasions, we looked at, on this program and many, many other programs, this downwind dispersion. Just like Bob explained it, very conventional stuff.

But what was just brought up is something new, I believe, whereby, and new for this program in terms of discussing an issue, that is the re-circulation of effluent back into an air intake. Is that what I'm hearing? The question is is it possible that something that was coming out of the stack going to the atmosphere may very well have been caught up in the downdraft of the building wake effect and brought in close to the air intake on the building, and then that stuff comes back into the building again? Is that the issue we're talking about?

DR. BUCHANAN: Essentially, that's
the way the model was set up.

DR. MAURO: Okay. This particular question, which is something I do not believe that we've looked at -- I mean I haven't looked at on this program -- I have looked at it in other capacities at commercial nuclear power plants for example -- this is an issue that people have dealt with. And I'm just offering this up to let you know that there are concerns related to how you design buildings to avoid this. As you can imagine, you don't want to do this.

However, in some of the older designs, it's been my experience that this has happened in the past in some locations and that there are probably ways in which you could try to figure out what the consequences could be in terms of how much you might take back in again. Of course, now we're getting into the realm of assumptions models, and I know that's always a little troubling. But
just to let everyone know that this issue that
is being raised here is a real issue that has
been raised in other venues and has been
addressed in other venues. I do not believe
we've yet addressed this re-circulation issue
on any site under this program that I can
remember.

DR. BUCHANAN: This is Ron again.

I think that one of the other issues is not
only how much is drawn back in is that you
don't account for any that's released into the
room, that it's assumed that it's all sucked
out the stack, negligible amount is in the
room, and this may be true. I just don't see
-- I'd like to see some verification of a
measurement made in a similar situation or
something that would support these
assumptions. The assumptions may be
conservative, they may be correct, but I just
don't see anything that verifies them.

DR. MAURO: As far as the uranium
concentrates go, it's not unusual for the concentrates to have a little bit of radium-226 and thorium-230 even though the concentrates, yellowcake, when they're shipped, have been, you know, long since been separated.

But there is, to varying degrees, I think there are data on the levels of 226 in thorium-230 that might be present in the concentrates. I'm not sure whether that gets up there, in other words, in terms of picocuries per gram, you know, how much might be in there if it's substantially elevated above, let's say, soil. I don't know. But I know that there is a little bit in there, so, yes, in theory, there could be some radon being emanated from the concentrates and either be released directly into the air in the room or going out a stack from the building.

But, yes -- but, of course, it is
nowhere near what you're dealing with when you're dealing with ore or even phosphate, whether it's ore, you know, with the uranium ore, crushed ore or even phosphate which itself has much lower concentrations of uranium and, of course, much lower concentrates of radium.

So this is a question that, you know, I don't recall us looking at before. But in theory, yes, there might be a little bit of radium in the concentrates.

MR. ROLFES: It may turn out that the background levels of radon in the area are actually higher than that which would be introduced to the plant from an ore concentrate as well. And we can take a look to see if we can find any information on ore concentrate radium concentrations and move on from there, I guess.

MR. POTTER: This is Gene Potter. If I might try and answer one of Stu's
earlier questions?

MR. KATZ: Sure, go ahead.

MR. POTTER: The model that Ron is talking about came from NCRP Report 123, and what was used in there are the suggested defaults in the model along with some Weldon Spring specific data like average wind velocity. And this model does take into account building wake effects for close in receptors. So the screening model, undoubtedly, it is conservative, but, as Ron says, there's no benchmark for that. We have to rely on the NCRP's good judgment. I don't think that we can say that this is a complete fabrication on the part of the ER team.

DR. MAURO: And I would add to that. In addition to NCRP 123, if you really want to get conservative, you go with COMPLY. This is the EPA's screening tool for demonstrating compliance with the radionuclide NESHAPs for radionuclide emissions from
facilities. And there's a graded approach.
The very first step in the process is simply, get ready for this, you simply say, okay, if you know the number of curies per second that are being produced by the inventory that you might have in your room of radium and, therefore, the decay rate of the radium, then, therefore, the production rate of the radon and that the discharge is going out a fanned exhaust that has a certain number of cubic feet per second. You dilute that radon, you know, curies per second into the cubic feet per second that's going out the stack, and that's the concentration in the stack. It can't be any worse than that outdoors.

So I mean that's a screening tool, by no means represented as being, for the purpose of COMPLY, and this is a compliance issue, there is no way that it could ever be higher than that outdoors. And, in fact, it really can't ever really be that high.
But you're correct. There are many, many ways of dealing with the downwind outdoor concentration of radionuclides that are released to the atmosphere, and any number of assumptions could be used that could place, certainly, an upper bound or a plausible upper bound. In my opinion, once you have a source term from a facility and you're interested in figuring out what the downwind concentration might be at the worst locations at any given distance or any given direction, this is a standard, very well accepted, widely used tool for doing dose calculations. And you can use any one of a number of assumptions to make it as conservative as you feel is appropriate.

This other issue that is mentioned about it coming back in the window or being actually generated within the building, that is a little bit more challenging. So I wouldn't say that there's not an answer to that, but it's certainly, the other part, you
know, the outdoor concentration is very conventional.

MR. POTTER: But John, you'd agree that it couldn't be worse than 100 percent recirculation.

DR. MAURO: Could not be worse than 100 percent recirculation, exactly right.

MR. POTTER: Which I think is what we modeled.

DR. MAURO: Oh, is that right? Oh, okay. And you got the numbers then? You know the radium concentration in your concentrates?

MR. POTTER: For this modeling, yes.

DR. MAURO: Oh, okay.

MR. RICH: John, this is Bryce Rich.

DR. MAURO: That would be from recirculation though, okay. In other words, it could be worse than that from
recirculation.

MR. KATZ: Bryce, did you want to

--

MR. RICH: Yes. This is Bryce

Rich. Just as a data point, the radium in

yellowcake typically is -- they were worked at

Fernald and Weldon Spring of about a factor of

hundred less than that in pitchblende ore.

There was some but it was in the nanocurie per

gram range of raffinate.

DR. MAURO: Okay, nanocurie.

MR. RICH: Right.

DR. MAURO: So it's well above

what you would see in soil, but it's well

below what you would see in ore?

MR. RICH: Yes. It's a couple of

steps down from what you'd find in ore.

DR. BUCHANAN: So do we have an

action item on issue number 4, on radon and so

on? Does NIOSH feel they can find any

benchmark at other facilities, or do you agree
to do that or don't agree?

MR. HINNEFELD: We'll consider what we're going to do. We may send a written position and we may decide based on what we've written, what we're going to stand on, so but we'll decide not in this room what we're going to do.

DR. BUCHANAN: Okay. That brings us to issue number 5 which is recycled uranium. Two issues here. I think one can be cleared up very easy, and the other one we'll want to discuss is that in the different documents, the use of recycled uranium coming from Fernald, assumably, started in anywhere from 1960 to 1962. And so there are some inconsistencies in how that was worded. And so I don't know if you've looked into that or not, but SC&A would just suggest that you document when that date was and have it consistent in the TBDs and ERs and stuff so if a dose reconstructor is assigning it at the
correct the time.

MR. ROLFES: We can certainly double-check on the date when the recycled uranium would have arrived at the Weldon Spring plant. And I believe what we have in the TBD is 1961. There was some wording about pre 1962 or post 1962 in the Evaluation Report. We'll double-check on that for you though.

DR. BUCHANAN: Yes. Several different documents, I quote them in the report, use different dates. Okay, that was a minor thing that just needs to be corrected for proper dose reconstruction.

The main issue with recycled uranium was that the way I understand it is that according to the TBD and according to Fernald's TBD which it took from, Weldon Spring took from Fernald was that the decision was to use 100 parts per billion of plutonium per uranium, and if a person had a uranium
bioassay, then take that amount and add it to his -- because they were not bioassayed for plutonium at Weldon Spring -- and so to compensate for that, and the worker at Weldon Spring had had a bioassay for uranium, then take 100 parts per billion plutonium for uranium.

And there's an equation there that you can decipher and figure out how you actually assign that in the Fernald TBD and have that listed in the report and it is correct.

But what I have an issue with is that then in the ER, we come down to a table which lists like 2.9 parts per billion plutonium for uranium. In addition, I went back and looked at some of the dose reconstruction where the person it'll say was less than 50 percent, and he was not assigned any plutonium dose with the measure of uranium dose there in `63 to `66.
And so I don't know where the number 2.9 came from in the ER and why it was less when -- for SEC to try and bound the dose, why that was less than what the TBD was.

MR. ROLFES: Okay. I'd be happy to explain that. If you took a look at the Fernald Site Profile and take a look at historical documentation on recycled uranium, the reactor sites, when they would reprocess uranium and send it back to a place like Fernald or Weldon Spring, tried to control the plutonium concentrations under 10 parts per billion on uranium S basis. And NIOSH had reviewed the recycled uranium data in preparation of the Fernald Site Profile and then subsequently for the Weldon Spring Site Profile.

And if you take a look, NIOSH found that some of the highest concentrations of transuranics in the recycled uranium being sent back to the Fernald site occurred in the
more recent era of late 70's, early 80's. And those were not direct shipments back from the reactor sites but instead came from the gaseous diffusion sites. And it's a separate source term, a separate type of recycled uranium which really wasn't the recycled uranium that we refer to in the normal context of things. These were exceptions to recycled uranium. These are essentially waste left over, junk that came out of a fluoridation tower from Paducah that were sent back to the Fernald site. These were some shipments that had greater quantities of transuranics in them, because they concentrated them in this waste product from which they decided they wanted to try to recover the uranium from at Fernald.

We used that single shipment essentially or those couple of small shipments from the Paducah site to increase our defaults from the 10 parts per billion control level up
to 100 parts per billion. And by default, we
used that at the Weldon Spring plant. Now the
Weldon Spring plant never received any Paducah
tower ash like Fernald did, and so we provided
a good basis for that in our Evaluation Report
and put together a 95th percentile plutonium
concentration in recycled uranium, and that
was 6.9 parts per billion plutonium on a
uranium S basis. We feel that the 100 parts
per billion that we defaulted to is very
conservative for the Weldon Spring site.

DR. MAURO: This is John. I might
be able to help out a little, too, here.
Certainly, RU is a very important issue. I
would say the most important issue that we're
dealing with right now at Fernald, and it's an
important issue at Fernald because of just the
reasons that Mark explained, that Fernald was
the recipient of recycled uranium coming from
a variety of sources, including the tower ash
from Paducah and many other places. And so it
was sort of the starting point of okay, now we're going to be processing uranium that is recycled and what is the plutonium, neptunium and others, technetium, radionuclides that might be present there. And there's a long story that we need not go into.

However, once processed through Fernald, then of course, there were other subsidiary operations where they went off to other facilities after Fernald had to deal with it. I think what Mark just said, namely the output that might come out of Fernald that might -- now this is something that I think is -- I don't have the answer to, but in principle, if Fernald received its material, did what it did with its material and then moved it on to, let's say, Weldon or any other materials facility that would do some further handling -- now we know a lot about recycled uranium at Fernald, and we also know that, you know, once it has been diluted down and
handled and then moved on for other management purposes, whether it goes through an AWE facility, for example -- whether it's true also for Weldon, I can't speak to that -- but the 100 parts per billion number is probably a very bounding number for facilities other than Fernald that were not receiving.

However, Mark, as we will see soon, we still have a lot to talk about regarding Fernald. I guess my question to the group here is did Weldon receive material, recycled uranium directly from Hanford, Savannah River, Paducah, or any material, RU, that went to Weldon, was that after it went through the Fernald dilution down and processing?

MR. ROLFES: It was after it went to Fernald that it was shipped to Weldon. It wasn't received by Weldon Spring directly from the reactor sites.

DR. MAURO: Okay. Well, I have to
say, you know, my first reaction to that is favorable, that is not the 2.9 percent. I think the 2.9 percent probably is a very good overall average for what the plutonium might be. The 100 parts per billion plutonium as being an upper bound for a place that received material from Fernald after it was diluted down is a very good number.

DR. BUCHANAN: This is Ron. Yes, but John, the ER states 10.9 for average concentration and 6.3 as bounding for Weldon Spring. The 100 was removed.

DR. MAURO: Oh, okay. I thought I just heard Mark saying you were using 100 for Weldon.

MR. ROLFES: That's what's in the current Site Profile which we've been using for dose reconstructions for the past 8 years I believe. The Evaluation Report we actually went back and did a site specific evaluation for the Weldon Spring plant and found that the
actual data for the Weldon Spring plant was much lower than what we had defaulted to in our claimant-favorable TBD.

DR. MAURO: You know, I would have no doubt, on average, the material, the RU that was received by Weldon or anywhere else was well below 100. However, there could have been -- well, when you look at the -- one of the problems we always run into in this situation is when you look at things in the aggregate over time and you look at the quantity that was handled and diluted and then produced, it averages out to some number, 6 percent certainly a good number, perhaps even 2 percent.

But on a case-by-case basis, shipment-by-shipment basis where a given worker might -- is it possible that there might have been some workers over some time periods that might have received 100. You know, right now I can't say -- I recall that
you used 10 at some of the AWE facilities, not
--

MR. RICH: This is Bryce, John. May I just make a comment quickly?

DR. MAURO: Yes.

MR. RICH: The tower ash that came from the gaseous diffusion plants was enriched as a result of the fact that plutonium was not volatile in the 6 form, and so it fell out in the tower ash and so it was elevated. It was -- they resisted taking that material in.

However -- and they were quite aware that it was coming in. The intent was to blend that tower ash in with virgin material like a processing material from yellowcake and others that they were processing at the time and blend it down so that the plant-wide transfer rate between plants of 10 parts per billion was always maintained so that, you know, they didn't ship anything from Fernald, and their sensitivity
following that receipt from the tails from the gaseous diffusion plants was very high.

DR. MAURO: I'd say I agree because I've looked at AWE sites, many of them and the end part per billion was 10.

MR. RICH: The stuff that they sent out of Fernald would have had to have meant the 10 parts per billion, not 100.

DR. MAURO: I agree. And I'm saying that I agree with you for the AWE facilities I looked at. I just can't speak to whether or not that also applies to Weldon. I certainly could speak to that 100 if that's what you were originally using for Weldon would certainly have been bounding. Backing off from 100 down to a lower number and if basically Weldon was receiving material just like other AWE facilities were receiving it after dilution down, 10 is probably a good number, too. But I can't speak to that specifically for Weldon, because I know there
was a special relationship between Weldon and Fernald and Malinckrodt, and I don't -- and when I talk about AWEs, I'm not talking about those facilities. Those were DOE facilities I believe. I'm talking about many of the AWE facilities that when we looked at that closely, we found the 10 number to be certainly a good number, 10 parts per billion number.

MR. ROLFES: I had a question also for you, Ron. This is Mark Rolfes. You had mentioned that there were some dose reconstructions that had been completed without the recycled uranium constituents added in on top of the uranium intakes?

DR. BUCHANAN: Yes.

MR. ROLFES: Do you remember the specifics of those dose reconstructions or was, for example, like the uranium bioassay data used to estimate the uranium intake --

DR. BUCHANAN: Yes.
MR. ROLFES: And -- okay. So were there any other things that might help us to understand why that might not have been done? I was wondering for some additional details. You know, could it have been that it was a dose reconstruction completed during the 50's rather than the 60's that might have been the reason recycled uranium wasn't added in, or was the dose reconstruction compensable? I'm just trying to get a better understanding of why that constituent might not have appeared in there.

DR. BUCHANAN: Okay, this is Ron. I would have to go back and look at those. I have my notes here that we had -- SC&A reviewed the claims indicating this method was correctly applied in one of the full dose reconstruction best estimate cases. However, in several of the DR cases where the Probability of Causation is less than 50 percent and a full DR should have been
performed and the EE worked during the 1961 to 1966 period, no internal intake from RU was assigned. I'd have to go back and get those case forms.

MR. ROLFES: Let me ask. Is it possible that we used OTIB-2, for example, in the completion of those dose reconstructions?

DR. BUCHANAN: Used what?

MR. ROLFES: OTIB-2 which would have been the application of the 28 radionuclide worse case scenario intakes.

DR. BUCHANAN: I don't know.

MR. HINNEFELD: This is Stu. I'd like to suggest if Ron can find those case numbers and refer those case numbers to us, that's the best way to proceed here, because if that happened, we'd need to figure out what happened.

DR. BUCHANAN: Okay. I'll look for those and send you that information.

MR. HINNEFELD: Thanks.
MR. ROLFES: Thank you.

DR. BUCHANAN: But that still does not answer our main question. Is this 6.9 bounding on Weldon Spring?

MR. ROLFES: Well, John Mauro did say that he agrees that the 100 parts per billion is currently bounding, and that's what we're currently using for dose reconstruction. We've just proposed the actual result site specific to Weldon. Because of the concerns from the petitioner about using surrogate data, we went back and looked at site specific data for the Weldon Spring plant, and it indicated much lower concentrations of plutonium in the uranium being sent to the Weldon Spring plant.

DR. BUCHANAN: Yes. And the case that I did review that did use it used 100.

MR. ROLFES: Okay.

DR. BUCHANAN: But that was before the ER. You know, that was -- they used
appropriate according to the TBD.

MR. ROLFES: So further, you know, make a statement across the board, recycled uranium doesn't contribute too much dose to the entire body as a whole but certain organs do have higher, not necessarily higher than the uranium doses, but can be significant to certain organs, certain metabolic organs. So for a systemic organ, for example, like the prostate or the skin or something like that, when you're calculating internal dose, the recycled uranium constituents are not significant in comparison to the uranium.

MR. KATZ: Can I ask clarification?

DR. BUCHANAN: Yes.

MR. KATZ: This is an SEC issue at this point? I mean given that -- it doesn't sound like one since even, I mean, John just said 10 parts per billion is the most that would ever go out, so you're already 10 versus
6 and whatever is correct --

DR. MAURO: Let me clarify that a little bit, Ted. The 10 is for the sites that I did review which was not Weldon but for other facilities that received --

MR. KATZ: That's right, John. It was Bryce who said that they never -- they wouldn't ship above 10 period off the site.

DR. MAURO: Right, and that's true. That's a spec that they worked from that other -- and we saw that at other AWEs, but what I'm hearing is there's a little ambiguity whether or not the -- whether 10 or 100 is being used at Weldon. I could say right now if 100 is being used at Weldon, that is going to be bounding without a doubt. I can't really speak to whether, for Weldon, 10 would be bounding.

MR. FITZGERALD: You're saying the TBD in place, the one that's actually being applied does use 100 as a default. Until that
TBD is revised, then I would assume that you'll continue to use 100. And in what Ted was saying, it sort of sounds like we're in Site Profile space.

DR. MAURO: I mean we're sort of just --

DR. BUCHANAN: I think we are if we use it as stated in the TBD. If we go down to using an average of 2.6 or bounding a 95 percent of 6.9 at Weldon, then we are in questionable --

MR. KATZ: It's still TBD.

MR. FITZGERALD: It is a question of what's appropriate and what the data supports. And I would think that it doesn't switch from 100 down to 2.9. I mean that's a pretty dramatic shift, and you'd have to provide some justification for lowering the default down to that level. And you said you have site specific information. That would have to be presented. You know, I think
there's a due process on changing the TBD that way.

DR. BUCHANAN: I have no problem with leaving it as a TBD issue. I mean I don't think it's -- I didn't know it's a TBD issue, but not as an SEC issue as long as the ER doesn't override the TBD.

MR. FITZGERALD: Doesn't sound like it.

MR. ROLFES: No. It wouldn't be used in completing dose reconstructions. We could certainly revise the TBD if the Working Group would like us to lower the plutonium intake that we're assigning, but I don't think we intend to do that. We just wanted to make sure that we've shown our basis.

DR. BUCHANAN: Okay. Well, I'll still send you those case numbers just for your information, so you can check out, you know, from a dose reconstruction point of view. You know, I might have missed something
on it, because I wasn't doing a complete audit on it. I was just checking. And just to make sure that that is being incorporated correctly. Okay, that's issue number 5.

We have a little after 12. Chairman, did you want to continue or what?

CHAIRMAN GIBSON: I guess we can move on to maybe 12:30 and then take a lunch?

MR. KATZ: I'm good with whatever.

DR. BUCHANAN: Okay. Issue number 6 was the neutron dosimetry, and I'd like to clarify that, set a little space there. When you use the enriched uranium of 1 or 2 percent, then you have the possibility of alpha-N reactions in the material and net neutrons.

And so what SC&A -- I guess one of the questions we have right now -- they were badged, some of them that were working with this material and had NTA film, but apparently, they weren't recorded, or if it
was recorded, they weren't kept. And so there
is no data for neutrons.

And so there have been several
proposal methods in the TBD and in the ER for
neutron dose assignments. And so I guess at
this point, I'd like -- and they're different
somewhat -- I'd like a clarification on when,
to whom, and how you currently propose to
assign neutron dose?

MR. ROLFES: Right now the current
TBD has information from the study that was
done at the Fernald site. They had placed
some bubble dosimeters in areas of green salt
drums, et cetera at the Fernald site and
characterized, taken some measurements with --
I don't recall if it was rem ball or what it
was -- I'd have to look back at the source
documents, but we developed a proposed
approach for the Fernald site and also applied
that to the Weldon Spring site.

What we've developed is to assign
a neutron dose equal to 10 percent of the photon dose received by the employee, and then the 95th percentile neutron to photon ratio would be .23 to 1 neutron to photon. We discussed this quite a bit at the Fernald site and came to agreement that that was, in fact, a bounding value to apply.

You know, for applicability to the Weldon Spring plant, there's not really anything unusual at the Weldon Spring plant which would negate us from applying that same neutron to photon ratio to the employees at the Weldon Spring plant. You know, for example, the types of materials, the quantities of materials and the composition of the materials that were received by the Weldon Spring plant were equal to or of lesser quantity or enrichment than the Fernald site.

DR. BUCHANAN: This is Ron. Now there was mentions of assigning missed dose.

Was that in terms of strict definition of
missed dose in the ER, assigning neutron
missed dose? When there's no TLD -- I mean
when there's no dosimetry record, you can't
assign missed dose.

MR. ROLFES: No. We would really
assign missed dose if an individual was shown
to have been monitored for neutron exposures
and we had a bunch of zeros reported to us, in
that case, we would assign half of the limit
of detection for that badge and multiply that
by the number of badge exchanges recorded in
their dosimetry information.

For an individual who was not
monitored at all for neutrons, we would assign
a neutron to photon ratio based upon what
we've documented in the Site Profile at Weldon
Spring, and that's what I mentioned before.
The 10 percent is the median neutron to photon
ration, .1 to 1 neutron to photon, and the
95th percentile is .23 to 1.

DR. BUCHANAN: So when you use the
term missed dose in the ER, you were talking about unmonitored dose, because there is no --

MR. ROLFES: Correct.

DR. BUCHANAN: Dosimetry records for neutrons. Okay. Now as described, and maybe this is a TBD issue, but we disagree with the method used to determine the neutron to photon ratio at Fernald. If I recall right, it was a one-time measurement done with certain geometry, and then a couple of years later, the gamma was measured, neutron was measured, and then a couple years later, gamma was measured. I don't remember all the details. And so I guess the question at this point is should we leave -- data is not recorded for neutron exposure? Okay, there's potential for neutron exposure but data is not recorded? They have come up with a method in the TBD to assign it using Fernald data which we disagree with, and do we want to leave this as a TBD issue or move it -- or keep it as an
SEC issue?

MR. ROLFES: We did close this at the Fernald site with SC&A's agreement that it was an acceptable approach and it was certainly bounding. We have to look back at the transcripts to pull that up, but we did close it for the Fernald Work Group.

MR. HINNEFELD: This is Stu. I don't recall the gamma and neutron measurements not being taken together.

MR. ROLFES: They used bubble dosimeters at the Fernald site on tops of the green salt barrels I believe. Then I think they had also done some gamma surveys at the same time.

MR. HINNEFELD: Should probably keep my mouth shut, because I'm conflicted --

DR. BUCHANAN: If I remember, the thing that sticks out is that they were done at separate times and, you know, usually, if you're going to do a N/P ratio, you're going
to do the measurements simultaneously. And I recall that was one fly in the ointment is that they weren't done simultaneously. But if --

MR. HINNEFELD: Ron, can you find the evidence found, where you see the evidence for that because that does not sound at all familiar.

MR. KATZ: Sounds like we need to check the record, because Mark's saying that this was closed at Fernald, but you're remembering that it hasn't been closed --

DR. BUCHANAN: Oh, I don't know about Fernald. It might have been closed. I wasn't on Fernald. I'm just looking back at the data that was extrapolated to Weldon Spring which didn't seem the way you normally determine N/P ratio.

MR. HINNEFELD: If you could find back the evidence for your conclusion that they were taken at different times, that would
be interesting.

MR. FITZGERALD: It would be useful to look at the transcripts for the last Fernald meeting, but just that discussion to see if that issue surfaced. Sounds like it was closed which means sort of a little bit of double jeopardy if -- because if they're a buy-in, at least for Fernald, on the methodology, so it is sort of question, what exactly -- how did they decide that? John, are you on? Maybe not.

MR. KATZ: John, are you still with us?

MR. FITZGERALD: Guess not.

MR. KATZ: Okay. But checking the transcript is an easy thing to do.

MR. FITZGERALD: Yes, just to shed some light on that question, because they're -- at different times, that would be a little harder to accept.

MR. KATZ: So that seems like a
starting place. Let's look at the transcripts.

DR. BUCHANAN: Right. I'll check and make sure of that.

MR. FITZGERALD: Maybe talk to John, just try to get some more comments. You don't remember that coming up, Mark, as far as questions of difference in times, timeframes for the gamma versus the --

MR. ROLFES: No, I don't remember that. It's been a few years probably since we've discussed that issue I believe, so --

MR. FITZGERALD: Okay, so it's quite a while a back.

DR. BUCHANAN: And it's been a while since I've looked at the details of that, since the Site Profile really.

MR. KATZ: So are you saying this was closed at Fernald a few years ago?

MR. ROLFES: Correct.

MR. KATZ: Okay. So --
MR. FITZGERALD: So we'll take the action to research -- figure out which meeting it was.

CHAIRMAN GIBSON: So SC&A is going to review the data and then you'll report back to us at the next meeting?

DR. BUCHANAN: Yes. Well, I'll send it out before so that they can see it if that's okay.

MR. KATZ: Absolutely. You can send a memo out to the Work Group and just say you looked into this, this is what you found, whatever it is.

DR. BUCHANAN: As long as it's on CDC website, right -- I mean computer? Okay. You don't remember, Mark, to save me a lot of hunting, when that was approved at Fernald?

MR. ROLFES: I'm taking a look. I'm trying to find the transcripts. I'll try to find them over the lunch break to see if I can get that to you.
DR. BUCHANAN: Okay, because I'm not familiar with Fernald. I haven't been involved in that. Okay. So that was item 6 on neutrons.

Item 7 is the issue of quarry and the raffinate pits exposures. As I brought up earlier, there are three main areas at Weldon Spring. There was the main processing plant, and they discharged to the evaporation ponds or raffinate pits, and there were 4 of those, 2 small ones to begin with in the early years, and then pit 3 and 4 were larger ones that were pumped into in the later years. And then there was rock quarry down the road which had a hole and water in it, and they dumped a lot of stuff in it from the downtown site and also from the Weldon Spring site. And initially, when they started doing some cleanup, they put some stuff in there, and then they took all that back out and put it under the rock pile I spoke of early for D&D.
And so what SC&A is concerned with with issue 7 was whether, you know, a person working out at the pits or down at the quarry probably wasn't considered an operation-type person, either laborer or something, and so he might or might not have been monitored. And to use the workers -- if you construct a coworker model for internal and external in the plant, would this be applicable to the people working in the quarry and the raffinate pit or around them or spending significant amounts of time around them, and so like maintenance workers, laborers and stuff, and so this is the issue on number 7.

MR. ROLFES: Okay. I guess we'd have to take a look at, you know, the specific individual, whether they spent a significant amount of time, you know, only at the quarry versus in the plant. And, you know, I'd put my money that if we assign doses based upon them working in the plant versus those in the
quarry, I could almost guarantee that the
doses in the plant would be higher than what
we would assign at the quarry, so it would be
more claimant-favorable to assume that they
were in the plant.

I think you had also mentioned
about the radon. You had replied about the
concern about decay products, and we had
identified some radon measurements at the
quarry of about .65 plus or minus .4
picocuries per liter.

I took a look to see what the
background outdoor concentrations of radon
from naturally occurring radioactive material
in the continental United States was, and it
ranges from about .27 picocuries per liter up
to about .81 picocuries per liter. So the
measured result from the quarry at the Weldon
Spring site falls within that range of
naturally occurring radon outdoor values.

You know, furthermore, if the
quarry is wet, it's going to do a pretty good job at keeping dust down, keeping environmental exposure potential to a minimum versus a dry environment as well.

DR. BUCHANAN: Well, the main concern was that the quarry received quite a bit of material from downtown, and so that would be different than what the material processed in the plant, so that worker, the operator in the plant, especially internal dose, would not -- you know, they might not look for isotopes and stuff of a guy working at the quarry or in the raffinate pits. Of course, contained discharges that would concentrate the byproducts, where they wouldn't be present in the operating realm, and so that was our main concern was not only the magnitudes but also the quantity or the radionuclides present would be different in the quarry and the pits than it would be in an operating plant.
MR. ROLFES: I think what we would have to do would be to look at some specific claims maybe to determine who was actually working at the quarry and didn't work at Weldon Spring or at Mallinckrodt, because as you said, Mallinckrodt dumped materials into the quarry as did Weldon Spring I believe, correct?

So, you know, the quarry is sort of unique, I guess, in that it's physically separated by a mile or more off the site, and it's almost a separate facility on its own. So I guess what we would need to do is look to see, you know, on a case-by-case basis, who worked at that facility and if they, you know, exclusively worked at the quarry versus in the plant.

Let's see, did I cover what you've asked here? Did you ask any other questions that I didn't address there?

DR. BUCHANAN: Well, is that an
action item on your part?

MR. HINNEFELD: Yes, we've got an action there.

DR. BUCHANAN: Right. And also --

MR. HINNEFELD: We need to provide a written response.

DR. BUCHANAN: Also, the Mason document of 1958 missed some quantitative or semi-quantitative information, and that can be compared to later years. I know some of the measurements, unfortunately, weren't made until the 80's when they started quantifying the site for D&D, and so very little was made earlier. Mason did have a document in 1958 that does list some of the concentration values for the different radionuclide if I recall correctly, and that's their reference number 15016 which, you know, that would be kind of a milestone you could check and see if there was a large difference or significant difference between `58, which would be a very
good year to compare it to compared to `88 or
whenever, some of the later measurements were
made, see if much have changed or not.

MR. ROLFES: Okay. We'll take a
look at that and also provide a written
response to that.

DR. BUCHANAN: Okay. The next
one, number 8, is off-normal situations and
accidents and incidents. I realize this is a
very subjective subject and issue.

When I did the interviews at
Weldon Spring couple of years ago, one of the
main issues was that their accidents and
things that today would be considered a
radiological incident, accident were not
documented in their files. And it was mainly
if something happened, like a furnace blowout
or an accident, they covered it from a medical
point of view, and it might appear in the
medical files, but there is no radiological
measurements or incidents recorded from a
So I went through some of the files to see and I state there one had a very serious accident in 1960 and in the medical files, there was no radiological information in his dosimetry or anything. There was just a medical aspect, you know, cut or bruise or burns and that sort of thing.

And then there was another one that said there was another major accident, and there wasn't anything in the files. Fortunately, in that one, the dose reconstructor went back and looked at some of the records and was familiar enough to know there was an accident that took place at that time.

So I guess it's kind of an open-ended question, but how do we know that these are being documented in their files and taken into consideration, not only the accidents but things that wouldn't be considered...
radiological hazard back then, such as, you know, some of the workers, maybe a truck driver or something transporting material from the downtown site out there, or going and picking up the irradiated -- they sent some of the uranium samples to betatron to be irradiated 25 MeV electrons to look at certain things, and back then, they probably just threw it on the truck and brought it back, and the airport site, some stuff was dumped there, and, of course, into the quarry.

Some of these workers, they weren't considered production workers. How can we determine whether these things are taken into account, and this is the issue.

MR. ROLFES: Well, as you pointed out, said the dose reconstructor was pretty familiar with the incident that had occurred, and so they did, in fact, account for this incident that you mentioned in 1960. I'm not directly familiar with it myself, but the one
important thing that we would have to look for
is did that individual -- you had said in the
medical file -- now that's sort of separate
from the dosimetry file -- do you recall if
that individual had some uranium bioassay
results in his dosimetry results from DOE?

DR. BUCHANAN: If I recall right, he had some. He had uranium bioassays and
external monitoring but not necessarily
connected with that incident. You know, it
was like, if I recall right, it was like in
the middle of a -- it wasn't like you could
say, oh, yeah, it happened on the 23rd and he
had bioassay on the 24th, 25th and the 26th.

MR. ROLFES: Sure. That's
important to know that the bioassay data are
there, because a previous exposure would
certainly be integrated into a later uranium
excretion quantity, and we certainly would
look at that. And when we complete a dose
reconstruction, we look at all the data that
we received, all the bioassay data and estimate an intake. If an individual was routinely being exposed, we will take that into account, and that's visible in their urinalysis data. We would assign a chronic intake which would typically account for that exposure that had occurred in a smaller incident.

If individuals have additional information, that certainly can help us focus in on a best estimate type of case for that specific incident. But usually, when we are completing dose reconstructions, we assign a chronic intake rather than multiple smaller acute intakes. And the way we do the chronic intakes, the chronic intakes usually result in more internal dose than evaluating specific acute intakes.

I'd need some additional information about this particular case, I guess, to make any kind of judgment as to
whether we've done a good job in estimating
the radiation exposure that he potentially
received from that acute intake versus how
much we assigned in the dose reconstruction in
a chronic intake, which is typically what we
default to.

DR. BUCHANAN: Is there an
accident incident file for Weldon Spring?

MR. ROLFES: As far as something
that we've developed, I don't know. We may
allude to some specific occurrences in the
Weldon Spring Site Profile. Sometimes we
receive information from individuals that were
directly firsthand involved in that incident
such as during a telephone interview for a
claim in a computer-assisted telephone
interview report, the individual claimant
might have said, you know, there was a furnace
blowout or, you know, I was contaminated with
uranium during this incident. So those things
are available.
Also, we do have DOE records from our data capture efforts that will identify occurrences that have taken place where employees were exposed to higher than normal airborne uranium or something for example. You know, whether it's consolidated into one place, I couldn't say that it is 100 percent complete consolidated in one single location, but the important thing is if there is bioassay data associated with that intake from which we can use to complete an intake estimate in our dose reconstruction.

MR. HINNEFELD: This is Stu. Ron, you said there was a particular case that you looked at that had to do with a furnace accident and there was information in the medical file?

DR. BUCHANAN: The medical aspect.

MR. POTTER: This is Gene Potter. I might offer a little information.

MR. HINNEFELD: Okay.
MR. POTTER: In the interview done at Oak Ridge with Monte Mason, he mentioned two individuals by name that had been involved in the most serious incidents at Weldon Spring, including one guy who had fallen or partially fallen into a vat of uranium-bearing material. And I was able to look those guys up in the CER data unambiguously. We just had their last names, and I didn't have an incident date. But both of those gentlemen were pretty heavily bioassayed.

DR. BUCHANAN: Around the incident time or you don't know?

MR. POTTER: Well, I don't know what the incident time is, but I think I can see it, you know, in the bioassay results, fairly major peaks on both of those guys.

MR. ROLFES: So as long as we have that data, you know, the bioassay data is the key. It's a matter of our interpretation of the data, how we assign intakes, and we don't
necessarily have to have a written specific data, because if we have enough bioassay data, we can actually pinpoint it based upon the excretion curve. And on top of that, we always use the most claimant-favorable solubility for the dose reconstruction target organ during the dose reconstruction process. And we do this in an effort to make sure that we're not underestimating someone's actual internal dose to that target organ.

DR. BUCHANAN: Chairman, I don't have any more specifics on that. It's just an issue that we were concerned with, and I guess at this point, unless we come up with other, we'll leave it open. If we come up with any other examples, we can bring them up. At this time, I don't have any other evidence to present. I don't have any evidence other than what the interviews told me, and so I can't really bring anymore than that on it.

CHAIRMAN GIBSON: You had
interviews with workers that documented events, and do you guys have that information from those interviews, and did you consider that in your dose reconstructions or --

MR. HINNEFELD: Well, I think what we should do is at least consider it in our response, because, you know, the next action here is our response. And I'm sure this is written more expansively in your review of the Evaluation Report than it is on this matrix. So the matrix provides summaries and findings, and those are written more expansively in the review of the Evaluation Report. So from our standpoint, I think we can take the action and go see that writeup. It could very well refer to interview summaries as references that would say, here are the summaries of these interviews. That would allow us to see the kinds of things that are being described.

I mean there have been instances where people will talk about chip fires in
this instance at a uranium plant, for instance a chip fire, and there were all these chip fires, and we just put them out and so on. And if it were an event like that, a bioassay record would provide probably an adequate way to reconstruct to doses for those people. There are a lot -- and what is an incident is largely in the mind of a person's personal experience. You know, something happens to me that did not usually happen to me, I remember that as an incident.

And in fact, it may be, unfortunately, consistent with the operating envelope expected for the plant and the programs set up for the plant so that a lot of metals plants really -- well, I'm sorry, the one uranium metal plant that I was familiar with, right up until the 1980's, had a certain view of inevitability of uranium chip fires. And so the expectation was that there was a sufficient bioassay program that exposures
from those uranium chip fires would be captured and the doses reconstructed appropriately from that. Whereas if someone was not, you know, did not have chip fires as part of their common experience, a chip fire would be an event.

So there is a little bit of that view, you know, that information you have to carry with you and read it, but I think it's really important for us to actually go look at those interviews and see those interviews and see if, in fact, we feel good about whether they're addressed by the exposure record or not, because there's no way to know unless we know what they said.

CHAIRMAN GIBSON: Well, yes, and I guess -- and that's personally my concern here, and it's not necessarily just with Weldon Spring, but if you have workers giving input to the system that's specific about them and somehow even though it was given to SC&A,
I mean all of their information is owned by the government. And so for them to go ahead and have a dose reconstruction and then this information not be considered, that falls a little bit more into the worker outreach type thing that, you know, I'm just a little concerned about that.

MR. HINNEFELD: Yes. And it's possible that the interview that occurred with SC&A and we'd do the dose reconstruction later. I mean that's possible. I think oftentimes that happens all the way around, like we've done a dose reconstruction before that interview occurred.

But by all means, our walk away position, our walk away thought, though, is that we need to first of all carefully read the Evaluation Report, not the matrix part but the Evaluation Report's description of this including finding the interviews. If they're not referenced, we can get a hold of SC&A and
say what are the interviews that this finding
is based on and sort of determine a reaction
to those interviews and whether we feel like
what we've done is appropriate or not or
whether there's something different that needs
to be addressed.

CHAIRMAN GIBSON: So that's what
you guys -- you guys want to do that and come
back to us --

MR. HINNEFELD: Yes.

MR. ROLFES: Now, Ron, do you have
a separate report of interviews? I don't
recall if you provided that. I know you
provided some summary data in your writeup of
the Site Profile review. I don't remember
seeing individual interview reports.

MR. POTTER: Mark, this is Gene
Potter. I've looked at SC&A's report and
these interviews are summarized in an
attachment I believe, but there is not enough
information to identify the individuals
involved. So if SC&A can provide those to you?

MR. ROLFES: That's what I was getting to, Gene.

MR. HINNEFELD: That would be important for an individual dose reconstruction. In terms of the broad question, do these incidents describe things that are beyond what we think would have happened and accounted for appropriately, that may or may not be necessary.

MR. ROLFES: I think as part of the Evaluation Report, we did consider some of SC&A's site expert interviews in our evaluation process, and I think we had included some analysis of what was said. Monica, do you happen to recall -- am I remembering this correctly that we did take some of SC&A's employee interview statements? One sticks in my mind here, and I think it was related to the receipt of pitchblende at
the Weldon Spring site. There was an interview, I think, from SC&A that they had conducted, and the interviewee had said that pitchblende was processed at Weldon Spring. Does this ring a bell, Ron? Am I --

MS. HARRISON-MAPLES: I don't recall it the same way that you're going over it right now. I do recall there was some interview summary information that we received that talked about storage of some other material. It wasn't so much pitchblende as it was cylinders --

MR. ROLFES: Enriched uranium hexafluoride.

MS. HARRISON-MAPLES: That's it and so we did a lot more investigation looking for that. We went out and we did some additional interviews asking other people did they recall any information about UF₆ cylinder storage. So I do know that we did follow-up on anything that we received from their
MR. ROLFES: Then, Monica, could you answer one other thing? Did we put that in our Evaluation Report?

MS. HARRISON-MAPLES: I believe we did. I believe we referenced it and said that we followed up and that the additional people that we followed up with were not aware of UF6 cylinder storage.

MR. MORRIS: Mark, Bob Morris.

MR. ROLFES: Yes, Bob.

MR. MORRIS: This topic you're were talking about, pitchblende. Actually, it came through as the uranium ore concentrates that were received were actually called "ore" by the local workers. And we followed that through to completion where we determined pretty conclusively that that was a misnomer. It was a local term, that they meant concentrates but they called it ore.

MR. ROLFES: Okay. Thank you,
Bob.

MS. HARRISON-MAPLES: Thank you, Bob. I didn't make that connection. You're right. That was another one we followed up on.

DR. BUCHANAN: This is Ron. I believe, Mark, that if I recall right, in the ER, the terms used -- the petitioner's concern. Now I don't know if he used that interchangeably with interviewee's concern, but I know in the ER, you said petitioner's concern, like you took those points from the actual petition, and so I didn't get the gist when I read it that it was taken from the transcripts of the interviews we conducted --

MR. ROLFES: We'd have to look back. I know that we had identified some of those issues as part of our Evaluation Report, and I thought that they had been -- you know, I thought maybe it might have been the same individual from an interview and also in the
petition, but certainly, we can look back at
the interviews that you completed and take a
look there to make sure that we've accounted
for the statements. That might make a
difference in a dose reconstruction.

MS. JOHNSON: Hi, this is the
petitioner, Karen Johnson, one of the
petitioners. I just wanted to make a
statement too that I did have an interview
with Monte Mason's right-hand man who did
confirm UF6 cylinders stored on site.

MR. HINNEFELD: This is Stu
Hinnefeld. Do you remember his name?

MS. JOHNSON: I don't have offhand
right now, but I can get it for you.

MR. HINNEFELD: Okay. If you
could provide that to us at our -- are you
familiar with our website and our email
address?

MS. JOHNSON: Yes, I can get that.

MR. HINNEFELD: And you send it
there or you could call our general phone
number, or really, you can submit it to
whomever you want and however you want. It
will get to us. If there is anybody involved
in this process you have contact information
from, if you can provide it --

MS. JOHNSON: Okay. I might do
that because I do have some contact with some
other workers and there aren't very many
living workers anymore, but they did talk
about the frequency of blowouts and
explosions. And I think you might want to
probably talk to them as well. I'm not sure
if anybody's ever talked to them before, but I
can pass on their information as well.

MR. HINNEFELD: Okay. That would
be fine. Thank you.

DR. BUCHANAN: This is Ron.
Karen, awhile back, you told me that one
person said he seen Congo or pitchblende or
something marked on a barrel. Did you find
out anymore information on that?

MS. JOHNSON: You know, I talked to him a couple of months ago at the Weldon Spring site, and I can give you his contact information. I think he had actually originally talked to one of the resource centers and they referred him to me. So I can give you his contact information if you want to contact him and ask him a question.

DR. BUCHANAN: Okay. He couldn't provide you with any further details than what you've provided me?

MS. JOHNSON: You know, I can't recall some, but he did talk about trucks coming on site with plutonium labels on them. And I don't know if they were heading to the quarry, but he said they often would stop off at the facility first.

DR. BUCHANAN: Okay. Well, if you could provide me with his information or contact later, I'll follow-up on that.
MS. JOHNSON: Okay, I'll do that.

CHAIRMAN GIBSON: Okay. That was all for number 8 then?

DR. BUCHANAN: I believe so.

CHAIRMAN GIBSON: So do we want to take a break at this time and have some lunch? It's 12:40.

MEMBER PRESLEY: What time are you coming back?

CHAIRMAN GIBSON: About an hour or as soon as the restaurant can get us through depending on how busy they are.

MR. KATZ: Okay. So break until 1:40? Is that what we're saying?

CHAIRMAN GIBSON: Yes.

MR. KATZ: Okay. Thank you for hanging in there on the line, and we'll --

MEMBER LEMEN: This is Dick again. How much longer do you think it'll take to get through the rest of the stuff? Do you have any idea?
DR. BUCHANAN: We got one more issue and then the summary action item list.

MR. FITZGERALD: We have the TBD issues. It's up to you if -- we're certainly going to have time for Site Profile issues if you want to go through those, too.

CHAIRMAN GIBSON: Yes. I'd like to get as far as we can.

MEMBER LEMEN: All right, thanks.

MR. KATZ: Okay, thanks, Dick.

(Whereupon, the above-entitled matter went off the record at 12:39 p.m. and resumed at 1:43 p.m.)

MR. KATZ: Good afternoon. This is the Weldon Spring Work Group Advisory Board on Radiation and Worker Health. We're just reconvening after lunch break. It sounds like from the number of people on the line that we have everyone back, but let me check on the Board Members.

MEMBER PRESLEY: Ted?
MR. KATZ: Yes.

MEMBER PRESLEY: I just talked to Dick Lemen. We both got cut off. Dick said he'll be back on in about 15 minutes.

MR. KATZ: You both were cut off. I mean we broke for lunch but --

MEMBER PRESLEY: Well, we were talking and all of a sudden, everything went dead.

MR. KATZ: Oh, I see. Okay. So he said he'd be back in 10 minutes? Is that what you said?

MEMBER PRESLEY: Fifteen.

MR. KATZ: Okay. Well, I think we should just go ahead and proceed, because we got a good bit ahead of us if we're going to go through TBD issues. Mike?

CHAIRMAN GIBSON: Okay. I think we've finished with the eighth issue just before lunch, so we'll turn it back over to SC&A and start on the ninth issue.
MR. ROLFES: Mike, this is Mark Rolfes. If I could interject something here before we start again. We and been discussing about neutron monitoring before the lunch break at Fernald, and I pulled up a reference which was a neutron monitoring position paper that was written for the Fernald site. The Site Research Database Reference I.D. is 3568, and this issue was discussed during the Working Group meeting that was held in October of 2008. It was October 28, 2008.

To summarize the discussion, if you look -- well, I'm looking at page 365 of those transcripts, and John Mauro has identified last item under 4.5 has to do with neutron doses. SC&A had raised the issue about the neutron to photon ratio where they had looked at our ratio of .23 to 1. John Mauro indicated that they had looked at that ratio and had done some calculations. They assumed some different kinds of geometries and
arrays of UF4, for example, in drums or piles, and they came up with a higher neutron to photon ratio. But he had indicated that they had made a mistake, said that they made certain assumptions regarding what types of materials were there and their assumptions essentially were so large that it would have caused a criticality issue.

He said they made a mistake and they redid the numbers, checked it again, and they concurred that the neutron to photon ratio of .23 to 1 was claimant-favorable. As far as their concerned, they no longer had an issue on that matter.

And then Hans Behling had also chimed in and had referred to a neutron monitoring position paper as well where they had detailed some neutron dose rates and photon dose rates. It was approved by Stu Hinnefeld at the Fernald site. And he said so rather than looking at theoretical
calculations that are the basis for the .23 to 1 neutron to photon ratio, he looked at the data in the neutron position paper, and it turns out the empirical data in that particular report, Hans' opinion was that the .23 was very claimant-favorable. And Hans reiterated what John had said, that they agreed that the .23 is a claimant-favorable dose ratio for neutron to photons and he things they should drop the issue. So that discussion took place over page 365 through 367 of the transcripts. Thank you.

MR. KATZ: Thank you, Mark.

DR. BUCHANAN: All right, thanks. Well, SC&A will look at that and confirm and send you the information.

DR. MAURO: This is John. I'm sorry, I picked up just a moment ago. You were referring to some exchange at Fernald?

MR. ROLFES: That's correct.

DR. MAURO: Okay. Good, yes, and
I do recall that exchange. Now how are we applying that here? I just didn't build that relationship between that discussion analysis, and I agree, by the way, with everything. I recall that and I just didn't pick up the applicability here to Weldon.

MR. ROLFES: The same -- we're using the same neutron to photon ratios for Weldon Spring plant dose reconstructions.

DR. MAURO: Okay, yes. So there wouldn't be any differences in, for example, the levels of enrichment? And I remember when we did that calculation, we made certain assumptions regarding levels of enrichment that would have been -- you're correct -- we would have had a criticality situation with the quantities that we were assuming, and, therefore, our original numbers were off. So you don't have any -- so you would have the same circumstance here. I'm just sort of getting myself oriented. Yes, I understand
what you're saying.

DR. BUCHANAN: Okay. So that brings us to SEC issue number 9, which is geometry and extremity monitoring. The geometry issue and extremity arises from the fact that at Weldon Spring, they did have monitoring badges on their chests for those working with radioactive material in general. However, there was no mention of geometry factors such as, for example, people that work in glove boxes, we're aware of that, TIB-10 where that was calculated, how you would -- if your badge is on your chest and you have anything between you and the material, such as a person working on a lathe or that sort of grinder with radioactive material, say, at Weldon Spring, and then have even just a plastic shield, a physical protection for eye protection and stuff, then the lower part of the body would be irradiated more than what the badge would register for beta radiation.
And one example I give in the report is that, you know, a simple plexiglass shield went from a very high rate down to background. And people working, say, in areas where the radioactive material was lower on the floor, a lower position than their badge, and unfortunately, there was an extremity dosimetry at Weldon Spring that I didn't find at all where the fingers and hands were monitored for people working, say, on machining and stuff.

And so I bring up the issue of how that can be corrected for the people that might have had that sort of exposure geometry.

MR. ROLFES: I think we had looked into this prior to the last meeting, and from what I recall, we had looked to see if there were any skin cancers on an individual's extremities and then on top of that to see if there were any that were non-compensable.

Based upon our review that I did probably...
about a year ago, we didn't find any non-compensable skin cancers of the extremities at that time. So that would be something that we would need to apply extremity doses and would need to develop the correction factors. If there's a non-compensable skin cancer case for an individual's extremity, we would need a method basically to assign shallow doses to the skin of the extremity, a way to correct for what might have been received by the hand versus what was recorded by the badge.

But from what I recall now -- and we can put together a number of -- we can look through the cases once again and put together a written report on this.

DR. BUCHANAN: What about geometry other than skin cancer or hand cancer if you're calculating the dose to other organs that may be underestimated by the badge on the chest? What about those situations?

MR. ROLFES: We did a similar
analysis for basically a cleaner contamination. We assumed that an infinite plane was contaminated with radioactive material. This is something that we can pull together and see what its applicability to Weldon Spring is. But we had done this similarly for the Nevada Test Site to look at correction factors for gamma doses from contaminated soils for example. And we can see if that would be applicable to the Weldon Spring Plant site.

And also, at the last meeting, I think we had agreed to look at the Mallinckrodt review that SC&A had done regarding unusual exposure geometries. And that work, ORAU Team's beginning to look into the review of the geometrical correction factors for gamma doses.

DR. BUCHANAN: So you're going to look at the Mallinckrodt geometry factors, how that was handled there?
MR. ROLFES: I think Arjun, at the last meeting, had asked us to take a look at their work on Mallinckrodt, on the review of Mallinckrodt TBD.

MR. HINNEFELD: Yes. There is a Mallinckrodt TBD procedure that describes certain geometry adjustments based on, I think, its three different source and receptor geometries, one of which is a lathe I remember.

And there are comments on that document in the Procedures Review Subcommittee, so I mean the entirety of it kind of has to be addressed for this. But I remember lathe as a specific one. An extended spill or a contamination, I think, on the floor I another one and then maybe an overhead source. I forget the third. There were three different source receptor geometries described in the existing procedure or TBD. And in conjunction with that, we would have to look
at the review findings of that procedure TBD
from that other Subcommittee and our response.

DR. BUCHanan: Okay. That is the
nine SEC issues and that then leads us to the
matrix on the TBD issues. Now the TBD issues
were addressed starting on page 12 of the
matrix, and this gets a little hard to
coordinate all the TBD issues with SEC issues,
because some of the SEC issues include some of
the TBD issues, maybe more than one of them.
And so I guess what I'll go over here, we
mainly came prepared for the SEC issues. The
TBD issues, we will go over and see if they
will be addressed by the SEC issues, so
there's no use rehashing them again if they
will be.

And so number -- page 12 there
where we have TBD finding number 10, this is
lack of atmospheric monitoring, now we also
want to consider number 10, 11, and 12
somewhat together, because all this is
environmental. And so I guess what I'd like to ask is now in the original TBD, we had mainly three sections, the environmental, internal and external. And in there we had a lot of questions on the environmental, and we brought those out in the issues.

And then in the ER, the main gist, if I recall right, is that the environmental issues could be bound by the fact that the worker could be assigned an operator's dose. And so I guess the question at this point, which way will it be? Is the TBD-4 going to be revised any? Are we just going to assign a coworker dose of an operator? Where do we stand on that?

MR. ROLFES: The TBD, to cover those three topics that you had just listed -- what was it, 9, 10, and 11 here -- the environmental TBD, TBD-4 for the Weldon Spring site has been revised in its draft form at ORAU. What we'd like to do is pull out the
relevant sections to answer those topics as a White Paper, and we’ll send that over to SC&A to take a look at. And that should respond to your environmental ambient doses issues.

DR. BUCHANAN: And that answered item number 10, 11, and 12.

MR. ROLFES: Does Bob Morris or Monica -- does that sound okay? Does that sound like something we can do relatively easily is pull out information to respond to these three topics identified by SC&A into a White Paper in advance of the publication of our revision of the TBD?

MR. MORRIS: This is Bob Morris. I think we can do that. The topics that are in the revised TBD-4 are -- should cover all of this information in finding 10, 11, and 12.

Yes, I think we can do that.

MR. ROLFES: Okay. Thank you.

MR. FITZGERALD: Just offhand, I mean given the specific topics, are these
topics that are addressed in the TBD? It's suggested that they are by how you're referring to them.

MR. ROLFES: I believe so. I know we've re-written quite a bit of the environmental TBD and the other TBDs as well as a result of the SEC Evaluation that we had done.

MR. FITZGERALD: You had the Site Profile review for a couple of years also so -

MR. ROLFES: Right.

MR. FITZGERALD: Okay.

DR. BUCHANAN: Okay. So SC&A will receive a White Paper outlining or revising TBD-4 to address those Site Profile issues 10, 11, and 12. That brings us to page 14.

This is Site Profile issue number 18, and this is uranium decay product. For the last meeting, I have a note here that you intend to revise the TBD to include this
product and that the wording before initial processing would be explained. Have we arrived at that report?

MR. ROLFES: That is also in part of the revision to the TBD, and what we need to do is pull that out as a White Paper as well I believe. I wanted to check with ORAU on the status also, once again, to make sure that this is something that we can do. And Bob, we have revised part of the internal TBD. Do we know how complete it is or do we have information responsive to this topic in our current draft that we might be able to pull out into a White Paper as well?

MR. MORRIS: Let me refer to Gene.

MR. ROLFES: Okay.

MR. MORRIS: You there, Gene Potter?

MR. POTTER: This is Gene Potter. Sorry. Ron, could I ask what page you're on for this particular one?
DR. BUCHANAN: Page 14. It's the SC&A TBD finding number 18. It's incomplete assessment of uranium decay products. You had a reply. In your TBD reply for the last meeting, it was your number 4.

MR. POTTER: Okay.

MR. ROLFES: Gene, this is Mark. I wondered if we might be able to -- I wondered if we had information responsive to the uranium decay product, Gene, in our current draft revision of TBD-5 that we might be able to pull out as a White Paper?

MR. POTTER: Yes. I believe that is the case. What we did was ratio to -- ratio some of the thorium 230 to the other radionuclides in the raffinate pits, and came up with a bunch of ratios there and an upper bound on them.

MR. ROLFES: Okay. So our action item is to basically pull that relevant information out of the TBD draft into a White
DR. BUCHANAN: Okay. And do you recall if the -- in that revision or did you check into what these changes will -- only be applicable to intakes before initial processing? Did you check into that wording, because I wasn't sure what they were talking about there.

MR. POTTER: This is Gene Potter. Was that question directed to me?

DR. BUCHANAN: Well, if you can answer it. This is Ron. In the TBD-5, they said -- your present wording is "These changes will only be applicable to intakes before initial processing," and we couldn't figure out on our last meeting what that really meant.

MR. POTTER: Right. I'm not sure if we've reworded that in the TBD draft of not, but the idea is that when the concentrates are received and they go through
the initial processing in, what is it, Building 103 -- I'm probably incorrect in quoting from my memory -- but that's where they have all the other constituents, and basically, as the uranium goes down the line, it essentially becomes pure uranium and all the rest of it goes to the raffinate pits. So we could probably take another look at that description, but that's the idea.

DR. BUCHANAN: Okay. Yes, if you can clarify that statement, it would help.

So that brings us to page 15, TBD finding number 20, solubility classes, and I think that we addressed that last time in that my question was how could you have all these solubilities for all the different things, because uranium is uranium, so you couldn't have different solubilities for the 234, 235, 238, at Weldon Spring's condition anyway. And your statement was that they were all to chose from, however, they did not have to -- didn't
mean they were all present in that form. And so I don't know if he's going to put a clarification in the TBD on that or not. You know, you clarified that. I have no real further question on that.

MR. ROLFES: Yes. The dose reconstructors will choose the solubility class of the uranium materials that's most claimant-favorable for the dose reconstruction target organ.

DR. BUCHANAN: So we really don't have an action item on that except for reply on primary finding number 20 in the TBD.

MR. KATZ: So is that one closed?

DR. BUCHANAN: Yes. We can close that. So that brings us to page 15, still on page 15, TBD primary finding number 21. And this is internal missed dose, MDAs. I believe that in the figure that was going to be used in the TBD was 0.08 milligrams per liter value, and what SC&A wanted to know was how
that was derived, you know, to sustain that
two number that was going to be used.

MR. ROLFES: Well, let's see. I
think our response to the document -- I think
this is something that we previously put in
for the last meeting, and the response here
was that the TBD doesn't contain a formal
coworker study. We've summarized the urine
data in Tables 528 through 517 for the dose
reconstructors to use to estimate doses if an
employee's do not contain data in a given
period. And since we have the data
distributions, we can always calculate a best
estimate or a maximum dose that the employee
received.

MR. POTTER: Mark, this is Gene
Potter. I have some information on that.

MR. ROLFES: Okay. Please go
ahead, Gene.

MEMBER LEMEN: This is Dick Lemen.

I'm back on.
MR. KATZ: Welcome back, Dick.

MR. POTTER: I've started to look into this MDA issue. I think there was a discussion in the last Working Group meeting where it wasn't clear to SC&A how this MDA value was in there, but should be, incidentally, .008 milligrams per liter or 8 micrograms per liter, the actual number. And what was done in the original TBD, and it will be in the Rev as well, was there was no use of modern MDA concepts, of course, in those days, so what the original authors did was to take a look at a site with similar technologies at a similar time and looked at the actual blank values and came up with that particular MDA.

Now at Weldon Spring, it turns out that that concept probably would never be used. In the CER data, I looked at the lowest non-zero value recorded for each year, and it's 1 microgram per liter, so a far lower value than what might be considered a
reasonable MDA from the blank values was being used. So if you have a zero at Weldon Spring, there were a number of things that the dose reconstructors could do, but the lowest recorded value would be 1 microgram per liter, so, for instance, you might use .5 micrograms per liter. I'm not saying that that is the policy, but it's a value much lower than what one would come up with for an MDA.

And then of course, since this is a uranium we're talking about, of course, you're not actually measuring zeros in the background population of workers. There is some exposure to uranium from diet and possibly drinking water, so I looked at the CER data again.

There are nearly 700 samples coded in a CER data as pre-job samples. A hundred and seven of those were zeros, and so I substituted a uniform distribution for the zeros so is an equal chance of between 0 and 1
microgram per liter. And those fit a log-normal distribution fairly well with an $r^2$ of .88. The median value was .4 micrograms per liter. So this is the background of uranium you're seeing in your worker population.

What NIOSH is doing is assuming that the 1 microgram per liter is occupational. More than likely, those numbers are background numbers, but they're being treated as occupational doses. So that's why this is very conservative without, you know, having a modern MDA concept specific to the site. That's all I have.

MR. ROLFES: Thank you, Gene.

DR. BUCHANAN: This is Ron. A little clarification here. You say the MDA value in the TBD is .008 milligrams per liter, 8 micrograms?

MR. POTTER: Yes, sir.

DR. BUCHANAN: Okay. And you say
that the data sheets from the workers in the files show less than 1 microgram?

MR. POTTER: I'm saying what's in the CER data is either a 0 or the lowest non-zero recorded number is 1 microgram per liter, and that's true over the whole site's 10-year history.

DR. BUCHANAN: And then you looked at 700 samples and they ranged from 0 to 1 microgram per liter? Is that what you said?

MR. POTTER: No. I looked at 700 samples that were coded as pre-job samples to the 50th percentile. Fitting those to a log-normal distribution of 50th percentile was 4 micrograms per liter.

DR. BUCHANAN: Four micrograms per liter.

MR. POTTER: Now some of these folks, you know, way out on the tail may have come from other uranium sites, but the bulk of the data fits the log-normal pretty well with
a 50th percentile of 4 micrograms per liter.

DR. BUCHANAN: Okay. So where did the 8 micrograms per liter actually come from?

MR. POTTER: That was some work done by the original authors of the TBD, and what they did was looked at the -- where they had actual logbooks of fluorometric data from a similar era at Rocky Flats so they could -- you know, how you would run a modern program would be to keep track of your blank population very carefully. And from that blank population, you would calculate a decision level which is the value that you would decide something is above background. Given that decision level, there is an MDA which is the value that you could reliably detect with that program given that blank population.

DR. BUCHANAN: Is any of this written up in the Revised TBD-5?

MR. POTTER: I think the Revised
TBD, at the moment, has essentially the same writeup as was in Rev 0. We were planning on providing this information to Mark separately.

DR. BUCHANAN: Okay.

MR. ROLFES: What we intended to do was to pull this information, once again, out of the TBD, since these TBDs are in draft form still, into White Papers for response to SC&A. And Gene, you are saying that this is documented in the draft revision of TBD-5?

MR. POTTER: Currently, the MDA description is the same as in Rev 0.

MR. ROLFES: Okay.

MR. POTTER: This work on looking at pre-job samples has just recently been done, and this is one of the things we were going to provide to you within the next week, a little writeup on this.

MR. ROLFES: Okay. And we'll take a look at that and then subsequently send that on to SC&A.
DR. BUCHANAN: Okay. So that was the TBD Primary Finding Number 21, internal MDA. We'll move on to page 16 now, which is Primary Finding Number 26, and this says "badging policy not consistent." Now this is one that spills over into SEC issue on coworker dose. I mean the main reason this has been here is to determine whether coworker data would be adequate or not. And so unless you have anything to add to that, I would say this would probably be wrapped up in our coworker dose for the SEC.

MR. ROLFES: I don't think we have anything to add right now.

DR. BUCHANAN: Okay. This moves us to page 17 of TBD Primary Finding Number 27, and that's coworker data development. And that, again, is in Item 1D of the SEC.

Page 17 again, Primary Finding Number 3 for the TBD, individual exposure versus average exposure. Okay, when it was
evaluated on the TBD, we were looking at the
enriched uranium and recycled uranium and the
thoron, the radium and the radon and thorium
such as being outside the normal uranium
processing bioassays and such and external
dosimetry. And so I would say that the issue
there is covered in our various SEC issues
concerning RU and other factors, the pits and
the fire issues. Anybody disagrees with any
of this, raise your hand.

MR. ROLFES: I had a little
statement if you want me to summarize it.

DR. BUCHANAN: Okay.

MR. ROLFES: I just put down in my
notes, the current approach in dose
reconstructions assigns a claimant-favorable
natural uranium intake based upon the
individual's bioassay. But the way that we
calculate the internal dose, we use the
isotope that delivers the largest dose in the
isotopic makeup of natural uranium. That
In addition to the uranium intakes that we assign, we also assign thorium intakes and other radionuclides, so we're not focusing on only assigning one radionuclide in a dose reconstruction. It's actually several we assign.

DR. BUCHANAN: Okay. Number 6, 7, and 8 are medical X-ray questions. Apparently, at Weldon Spring, it was all the medical -- they did have a medical nurse there I guess, and they contracted all their medical MDs, exams and X-rays and stuff to the outside. And apparently, maybe they had a doctor come on site once in a while, but they did no medical X-rays on site as far as I can tell.

They were required to have certain X-rays at certain times. However, in the documents I had looked at, I could not find anything that lists anything specific for
Weldon Spring as far as the frequency and PFGs obviously did a much higher dose. At that time, they could have required them. They might not have and so we couldn't find out for sure, and the lumbar spine exams were often given to certain people with lifting and such. And so I could not find any information on what was required there. So I was wondering if NIOSH had determined any of those any further than what the TBD-3 said, which said essentially they didn't have any information.

MR. ROLFES: Well, if X-rays were not done on site at the Weldon Spring plant, they were outside of the covered facility, and so they wouldn't be included under EEOICPA in the dose reconstructions.

MR. ROLFES: So if they truly were all taken off site, we wouldn't be including those as covered exposures.

DR. BUCHANAN: Okay. I don't think that that's the way it was done at other
sites, is it? I believe --

MR. HINNEFELD: Not consistently.

That's a fairly recent interpretation. The question was raised fairly recently to others outside of our office in NIOSH about what you do in this situation. And our advice back was that the law requires reconstruction of the dose at the site and doses received off the site can't be included. That was sort of to our chagrin. That's the advice we got and that's fairly recent advice we received.

CHAIRMAN GIBSON: That's a NIOSH decision? I mean that's not something that DOL or DOE -- DOL would make?

MR. HINNEFELD: It is -- no, no.

DOL gives decisions about how to reconstruct the dose, what doses to reconstruct -- they leave those up to us essentially. This is from -- this is an interpretation, a recommendation based on the specific language in the statute. And I could find it
eventually and provide additional information about what this means, but I don't remember right off hand. But I do remember it is a recommendation to our division from others in -- well, others in HHS at least -- HHS about what that language in the statute, actually, it has to be interpreted.

CHAIRMAN GIBSON: So since the decision came from within the Agency --

MR. KATZ: Within the Department.

MR. HINNEFELD: It would have been the Department.

CHAIRMAN GIBSON: It would be something that the Board could at least address and make a recommendation or --

MR. HINNEFELD: I think they could advise the Secretary as they see fit. That would then be for consideration. You know, the entire consideration of it would be outside of our division but within HHS, so I would guess that would be true. I don't know
exactly.

CHAIRMAN GIBSON: Because, you know, it just seems odd that irregardless of where the X-ray took place, if it was required because of your employment, it looks like it should be --

MR. HINNEFELD: Understand exactly. I'm not arguing the point.

MR. KATZ: That's exactly how we originally came out determining --

MR. HINNEFELD: That's why we were doing things differently at other sites --

MR. KATZ: So that's why things had been done differently as you're thinking all along, but I gather -- I'm not familiar with this, but if this is current legal interpretation, I do -- I am familiar with the language in the statute that says it's at such facility, the exposure, so I can understand where that might be coming from.

CHAIRMAN GIBSON: I mean this
could get into different areas. You know, for example, you had drivers at Mound that would take radioactive material in trucks and transport it off site to a different location, so from the minute they cross the boundary line of a site, we quit recording their dose or --

MR. HINNEFELD: I think in those situations, if you could do that, that we would be expected to do that.

MR. KATZ: Same with airplanes, so I think that's already in play. That already operates with people off site. They don't aren't credited with exposures that occur off site, even if they're doing their job.

MR. FITZGERALD: I think they came up at Los Alamos with an airborne --

MR. KATZ: It did. But that's just a question of how the statute is written and how it can be interpreted.

DR. BUCHANAN: So essentially,
we're saying, no one will be assigned medical
dose at Weldon Spring?

MR. HINNEFELD: If there is
definitive evidence that they occurred with
the X-ray exposures, medical exposures
occurred off site, then they would not be
included in a dose reconstruction. If it's
subjective, if it's a question, if we don't
know where they were performed, then our
presumption is we're going to presume that
they were performed on the site and be done,
and then we would have deal with the issues.

So in this instance, we expect --
we're relying on definitive evidence that they
occurred off site in order to exclude them.
If there is not definitive evidence, we
consider as occurring on the site.

DR. BUCHANAN: Okay. And so
what's the dose reconstruction being done now
or have been done --

MR. HINNEFELD: Up to now, I
believe they're probably doing them according to the Site Profile, which was written before we got this advisement, so they're probably being included.

DR. BUCHANAN: Okay. So how are addressing these different exam frequencies and PFG and lumbar spine.

MR. ROLFES: The Site profile does have a statement about photofluorography not being present on the site, so that technically is not included in dose reconstruction practice. And I believe the default that we have for medical X-rays would be to assign an annual X-ray dose for an employee for -- it basically would be a pre-employment exam, an annual physical, and then a termination X-ray. Unless we have records in the individual employee's medical history that they received more frequent X-rays, we would typically default to an annual X-ray.

MR. HINNEFELD: Yes, and lumbar
spines are usually done when there's evidence of a lumbar spine. It's usually not assumed.

But if there's evidence that lumbar spine exams were done, the screening exams, then those are included. And without evidence, they generally are not.

DR. BUCHANAN: So you're just assigning a PA --

MR. HINNEFELD: Yes, PA chest.

DR. BUCHANAN: Now this -- with that ruling, I don't know that SC&A --

MR. FITZGERALD: Well, it makes some of this moot. I guess the question of ambiguity, you know, if there's no firm evidence which way it went, then we'll tilt toward including it. But if it's clear like PFGs, they were done definitely off site, they're out according to this rule.

DR. BUCHANAN: So that brings us to page 20, TBD Secondary Finding. Most, I think, of what's left here are secondary
findings which, you know, we had some questions on, but it wasn't necessary to change drastically a dose assigned. The primary findings we feel are -- would materially change the dose assigned to a significant number of workers.

So TBD Secondary Finding 14, the ratios used during operations should be used with caution. I don't know if -- I guess we were looking for some clarification on that. They say in the TBD-4, so again, if we're not going to use TBD-4 as is, we reviewed the Rev 0. Do you know if anything has changed on that I guess would be the first question.

MR. ROLFES: If it is, I believe we will capture that in our White Paper that we pulled out of the revision of the environmental TBD, and we'll clarify the locations if we need to.

DR. BUCHANAN: Okay. Finding 15 on page 20 was the thorium-232 process. I
think that with the SEC issues that we -- that
would be involved in answering those questions
unless NIOSH had anything else to add to that.

MR. ROLFES: I'd just put a note
here that in addition to the uranium intakes
that we assigned based upon bioassay data,
NIOSH also assigns thorium-232 intakes as
we've described in the Weldon Spring Site
Profile which is currently approved, and we're
going back to revisit that because of the
additional data that were located since the
TBD was written and also to be consistent with
what we've said in our Evaluation Report.

DR. BUCHANAN: Will that be in the
Revised TBD or will that be in the White Paper
also?

MR. ROLFES: This will be in a
White Paper, I believe. I'll have to double-
check on that just because -- maybe Gene or
Bob might be able to elaborate a little bit
further. Did we consider thorium effluent in
our revision of the environmental TBD?

MR. MORRIS: This is Robert Stand by, and I'll answer that.

MR. ROLFES: If you'd like to move on to the next one, Bob can come back with --

DR. BUCHANAN: Okay. That takes us to page 21, top of the page, Secondary Finding 16 for the TBD. This is environmental dose used from Fernald. Now in the original TBD, there was data used from Fernald in that. Now I understand from the ER, you were not going to use that. Is that correct?

MR. ROLFES: That's correct. We've used site specific data for the Weldon Spring plant, and this will also be put together in our White Paper for -- we'll pull out a response from the revision of the TBD-4 into a White Paper for SC&A.

MR. MORRIS: Mark, Bob here with the answer to --

MR. ROLFES: Yes, Bob.
MR. MORRIS: What will be included in -- there will be a table in the White Paper that you will receive that is entitled "Estimated Average Annual Inhalation Intake of Radioactive Particulates in Radon at Weldon Spring Plant, Weldon Spring Quarry," and it will have U-238, U-234, radon, and natural thorium and thorium-230.

MR. ROLFES: Great. So that should respond to the issue that they've identified.

MR. MORRIS: And then for a few years after the operational period, we'll have gross alpha and radon and -- yes, there will be an added column "gross beta and gross alpha" for those post op years.

MR. ROLFES: Thank you, Bob.

DR. BUCHANAN: That brings us to page 21, Secondary Finding Number 22, "cost center codes may not be reliable for doses." That kind of brings us back to the question of the coworker and the validity of the
representativeness and stuff. There was a statement on one of the documents I think I quoted in our review where -- that the cost center codes were there, but they didn't really represent necessarily where the person worked and his job function.

And so I guess my question at this point with the revisions and stuff, are you using the cost center code for any categorization or anything that would affect dose assignment?

MR. ROLFES: No. To my knowledge, no. We would basically start off with the individual's own dosimetry records, his bioassay data and use those to assign a uranium intake, use his own dosimetry records to estimate his external dose and then apply claimant-favorable assumptions about how we go about calculating those doses to the target organ, including claimant-favorable assumption of the solubility class which results in the
highest internal dose to the target organs.

So there is --

MR. MORRIS: Mark, Robert Morris.

MR. ROLFES: Yes.

MR. MORRIS: I'd like to add to that. That statement was attributed to a person regarding the operations of Mallinckrodt at the Destrehan facility. We specifically asked some of the people we interviewed who were in a position to know the quality of that data as they moved forward in time to the Weldon Spring site, and they said that they purposefully improved the quality of that data as they kept up with it much more rigorously in the later years and said they would have no problem with believing that they had it correct in the operational years at Weldon Spring.

MR. ROLFES: Thank you, Bob.

MR. MORRIS: You're welcome.

DR. BUCHANAN: Well, I guess my
question would be if the cost center code
would be used in coworker dose determination
or model or anything, there would be a caution
you -- I don't know exactly what he's talking
about there. You know, maybe it's true, but
the cost center code might be checked before
we use it to create any coworker model.

MR. ROLFES: We'll keep that in
mind.

DR. BUCHANAN: Number 23 on page
22, thorium was not bioassayed for -- at
Weldon Spring in vivo. There was one last --
just before they closed down, there was an in
vivo portable counting facility came there and
counted like 148 or something workers for
thorium. This was used to determine -- a few
had -- most had negative reports, of course,
if they're MDA or they may not have called
that MDA in that time but what they could
detect. A few were on the borderline.

I guess I understand though that
you're not going to use this in vivo counting for any coworker or dose reconstruction directly.

MR. ROLFES: We agree -- NIOSH agrees with that, and we don't typically use the results of the in vivo thorium-232 counts during the dose reconstruction process.

DR. BUCHANAN: So -- or coworker--

MR. ROLFES: Correct.

DR. BUCHANAN: So I think we can close that issue then.

MR. KATZ: And just for clarity, the issue before, it sounds like that -- is that closed, too, that we just covered, the coding? It's closed unless it comes into play for a coworker model.

DR. BUCHANAN: Correct. That brings us to Number 24 on page 22, the last secondary TBD findings, and enriched uranium not -- addressed, and this is coming from the fact that this was taken from Fernald. We
used 1 percent enriched uranium, but SC&A really didn't see that it was documented well that this was an upper limit. In the dose reconstruction, we're using 1 percent?

MR. ROLFES: That's correct.

DR. BUCHANAN: Okay. Do we have documentation showing that there was nothing else supplied to Weldon Spring above a 1 percent, because in the Fernald, I think if you go back and read its TBD or some of its associated documents, they say 1 to 2 percent.

MR. ROLFES: Yes. We switched to 2 percent as a default for Fernald. I believe the year was around 1965 or 1966, and that's separate from the Weldon Spring plant. If you take a look at the documentation, they actually have some procedure manuals for handling .85 percent enriched and .95; .947 is probably what it was actually. But anyway, you know, if you take a look at the probability that a worker was only exposed to
1 percent enriched uranium, I don't think you could find anybody that was routinely and exclusively exposed to 1 percent at the Weldon Spring site.

Looking back at the Fernald data that we had analyzed, we had identified some individuals who had been involved in handling some low enriched uranium during various campaigns that lasted weeks to months, and some of the enrichments were between 4 and 6 percent. And we had taken a look at their lung counts, their in vivo lung results, and also had basically inferred from those data reported in the lung counts what enrichment they had been exposed to.

And if you take a look, even though they were working with some 5 percent enriched materials, on average, their lung counts showed that they were roughly under 1 percent enrichment, pretty conclusive that it was maybe a slightly higher value than natural
uranium but certainly under 1 percent
enrichment. And I think during that time
period that that work had taken place, we had
defaulted to the 2 percent enrichment.

So I looked back in the Site
Research Database as well for Weldon Spring
data, and the maximum enrichment that I saw
for any product at Weldon Spring was the .95
percent enriched, and these were for some
specific Hanford fuel cores. I think they
were the Mark V external cores.

DR. BUCHANAN: So these came from
Hanford rather than Fernald?

MR. ROLFES: I believe the
material came from Fernald for Weldon Spring
to produce the cores for Hanford, but I'd have
to take a look back in the procedure. I just
happened to look through last night. And
there is also a similar procedure for .85
percent enriched. I might be able to identify
the couple of Site Research Database documents
if you like right now, if you can give me two
or three minutes here hopefully.

Okay. The first one here is --
it's under Weldon Spring plant. It's 11814.

DR. BUCHANAN: 11814.

MR. ROLFES: Correct. And that is
the Manual for Criticality Safeguards and
Processing, and there's a typo. It says .086,
but it should be .86 Percent Enriched Uranium.
The second one is 11819, and it is Additions
to the Mallinckrodt Chemical Works Manual for
Criticality Safeguards and Processing .95
Percent Enriched Uranium. I didn't see any
other documentation of enrichments which
exceeded that.

DR. BUCHANAN: And so you say the
2 percent at Fernald didn't start taking place
until what year, 60-what?

MR. ROLFES: From my memory, it's
1965, I believe was the time period because of
the requirements for the N reactor at Hanford.
If anybody knows differently, please correct me. And I believe most of that stuff wasn't even 2 percent. It was a very limited amount. It was actually 2.1 percent which was the requirement for the N reactor, I believe, and most of the stuff was .947 percent or 1.25 percent enriched.

DR. BUCHANAN: Yes. I'll look at those two documents, you know, just to verify the 1 percent. Mr. Chairman, I'm done with the Site Profile issues.

CHAIRMAN GIBSON: Okay. So are we all clear on what actions we got?

MR. KATZ: Do we need to run through the actions now before you guys trade emails on them and stamp them in concrete, or do you think you guys have good notes and --

CHAIRMAN GIBSON: Need more clarification?

DR. BUCHANAN: I don't need more clarification. I think for the record, so we
would go back, look at the transcript. We don't have to go through 365 pages to find out what our action item was. So I will read off what I think I am to do, and anybody correct or addition to that. And then Mark can read off what he thinks he's going to do, and that way, it'll be at the end of the transcript, if that'll be okay with you --

MR. KATZ: Well, actually, I mean so if you want to do that, that sounds great, but what I'd like to do following this meeting then is once you've traded this discussion right now, just go back and trade emails so that we can actually just put out -- we don't have to wait for the transcript, which takes at least 30, more like 40 days to come out. So just trade emails so that we'll have an action list via email.

MEMBER PRESLEY: This is Bob. Could you get that action list to us?

MR. KATZ: Yes. The action list
will go to the whole Work Group, of course, but they'll trade emails until they've got it where they're happy with what it says.

MEMBER PRESLEY: Thank you.

DR. BUCHANAN: Now the point of contact for NIOSH will be Mark. The point of contact for SC&A will be -- okay. So then we can distribute it to your group, and I'll distribute it to SC&A. Now who wants to distribute it -- do you want --

MR. KATZ: If you just send it to me, I'll distribute it to the whole Work Group --

DR. BUCHANAN: You'll get it to the Work Group?

MR. KATZ: Yes, that's fine.

DR. BUCHANAN: Okay. And we don't want to miss anybody.

MR. KATZ: Right. Thank you.

DR. BUCHANAN: If you want, take a short break or something. I'll have to go
through and see exactly what I'm supposed to do. Do you know exactly what you're supposed to do?

MR. ROLFES: I'll have to organize my notes. It might take me a little time because I'm probably going to have to request Stu's help here to make sure I've captured things.

MR. FITZGERALD: Would it be better just to trade -- I'm not sure if we're going to gain --

CHAIRMAN GIBSON: If we're going to do what Ted said, do we really need to go over it here?

MR. KATZ: Unless you want to talk about it right now because some things are unclear and it will be easier, we can just do this off line by email.

DR. BUCHANAN: Okay.

MR. KATZ: Either way.

DR. BUCHANAN: That will be fine
with me. There's a lot of --

MR. KATZ: I took notes, too, so if both of you come up short on something, you can ask me, and maybe I'll have it.

CHAIRMAN GIBSON: Okay. Is there anything else we need to talk about while we're here other than possibly another meeting?

MR. KATZ: I don't believe so. It sounds to me a little premature to schedule another meeting until there's -- unless you have a rough sense already -- and most of the action items are in your plate, Mark.

MR. ROLFES: Right. We're currently working to come up with dates for our responses, so without having those dates yet, I can't really give an idea of when the next Working Group meeting might be. As soon as we get the dates scheduled and our action items here, I'll try to get an update to the Advisory Board Working Group on when we hope
to have those work products completed and sent over.

MR. KATZ: That'd be good, so when you do that, then we'll figure on -- we'll schedule once we --

CHAIRMAN GIBSON: I'd like to at least think about no more than a couple of months, I mean just to keep this thing on track. There's so many of these Work Groups that have, at least mine, have got off track.

MR. KATZ: The other option is we can book something and then reschedule if it's -- if we want to look out a couple of months now, we can do that if you guys are prepared to do that.

CHAIRMAN GIBSON: Yes. Let's put something on there --

MR. KATZ: Let's put something on there then, and we can re-book if it doesn't seem feasible anymore once Mark's done his homework. Let me run out to March and see
what we have on the books already.

CHAIRMAN GIBSON: We got a Dose Recon on the 14th and then a Procedures on the 22nd.

MR. KATZ: Procedures on the 22nd. The 22nd seems more closer to the ballpark of at least giving two months. I mean the 23rd right now is open for example. We don't have that much -- we don't have -- let's see, Procedures. And Dick is on Procedures, too, Subcommittee, so that might make things easier for him as well. Dick, are you still with us? Dr. Lemen?

(No response.)

MR. KATZ: Might have lost him, but I know he can make the 22nd, so how does the 23rd look for folks? This is March 23rd. That's a Wednesday.

Does that look okay to you? And Mark?

MR. ROLFES: As far as I know --
MR. KATZ: I know. This is just a place to start.

MR. HINNEFELD: As far as I know, it's okay for us. It's okay for me.

MR. KATZ: Okay. So tentatively, we'll send out a notice for the 23rd, but I'll check with Dick before I do that actually.

And, Bob, are you still with us?

(No response.)

MR. KATZ: so I'll check with Bob and Dick. If the 23rd looks good for them, we'll pencil that in for now and, you know, a few weeks down the road when Mark knows what's going on, we'll reconfirm. Very good.

MR. HINNEFELD: We'll start at 9 o'clock again?

MR. KATZ: Yes.

CHAIRMAN GIBSON: See if Ted can get us moved to Dayton by then.

MR. KATZ: I'm sorry, but that's just -- actually, for this Work Group, that
would work, but -- anything more for the good of the order or --

CHAIRMAN GIBSON: I don't believe so. Nothing else, then we're adjourned.

MR. KATZ: Okay. Then we're adjourned. Thank you everyone on the line that's out with this Work Group. Nice meeting. Take care.

(whereupon, the above-entitled went off the record at 2:48 p.m.)