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

convenes the

WORKING GROUP MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

LINDE SITE PROFILE

The verbatim transcript of the Working Group Meeting of the Advisory Board on Radiation and Worker Health held telephonically on June 6, 2008.

STEVEN RAY GREEN AND ASSOCIATES
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TRANSCRIPT LEGEND

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

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(10:00 a.m.)

WELCOME AND OPENING COMMENTS

DR. CHRISTINE BRANCHE, DFO

DR. BRANCHE: Welcome to the Linde Ceramic site profile working group. This is Friday, June 6th. I'm Dr. Christine Branche. For the moment I'm going to be the DFO, and then Ms. Chia-Chia Chang will be the designated federal official from NIOSH. Would anyone who's on the working group, please state your name?

DR. ROESSLER: Gen Roessler.

MR. GIBSON: Mike Gibson.

MS. BEACH: Josie Beach.

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

(no response)

DR. BRANCHE: Are there any other Board members who are on the line?

(no response)

DR. BRANCHE: Okay, we do not have a quorum so we can proceed.

Would the participants from NIOSH

please state your name and say if you have a conflict with Linde?

MR. CRAWFORD: Chris Crawford, no conflict.

DR. BRANCHE: Thank you, Mr. Crawford.

Any other NIOSH staff members on the line?

DR. NETON: This is Jim Neton, no conflict.

DR. BRANCHE: Would the staff from OCAS please state your name and say whether or not you have a conflict?

(no response)

DR. BRANCHE: Sorry for the background noise here.

SC&A staff would you please state your name and say if you have a conflict for Linde?

DR. OSTROW: This is Steve Ostrow, no conflict.

DR. ANIGSTEIN: Bob Anigstein, no conflict.

DR. BRANCHE: Thank you.

DR. LOCKEY: Jim Lockey, no conflict.

DR. BRANCHE: Dr. Lockey, I'm glad you could join us. Thank you.

DR. LOCKEY: Can I make one comment? One of my staff people unexpectedly passed on, and I have a funeral at 11 o'clock. So I'm driving

on the way to that funeral --

DR. BRANCHE: Please be careful.

DR. LOCKEY: I will. If I have to cut out, that's the reason.

DR. ROESSLER: Thank you for participating, Jim.

DR. BRANCHE: And we're sorry for your loss.

Are there other federal agency staff who are on the line?

MR. ELLIOTT: This is Larry Elliott joining the line. I have no conflict on Linde.

MS. HOWELL: Emily Howell with HHS.

MR. KOTSCH: Jeff Kotsch, Department of Labor.

DR. BRANCHE: Thank you.

Are there petitioners or their representatives who are on the line?

MS. BONSIGNORE: This is Antoinette Bonsignore.

DR. BRANCHE: Are there workers or their representatives who are on the line?

(no response)

DR. BRANCHE: Are there members of Congress or their representatives who are on the line, please?

(no response)

DR. BRANCHE: Are there any others on the line who would like to state their names?

MR. GUIDO: This is Joe Guido with ORAU.

DR. BRANCHE: Joe Guido?

MR. GUIDO: Yes.

DR. BRANCHE: Thank you so much.

Dr. Roessler's about to begin her meeting, and I think we ask that if you're participating by phone it's important that we mute our lines including me. If you would please mute your lines until you're ready to speak. If you do not have a mute button, then use star six to mute your phone for everyone to be able to hear and so that for the call to proceed well it is important that everyone who's not speaking mute their line.

With that I hand it over to Dr. Roessler. And Dr. Roessler, Ms. Chia-Chia Chang will be the DFO. Thank you so much.

INTRODUCTION BY CHAIR

DR. ROESSLER: Thank you, Dr. Branche.

I want to remind everybody that we're scheduled for one hour today. I think that will be ample, but we all need to keep our

comments as brief as possible.

The first thing I want to verify is that NIOSH has the report that was sent out earlier this week. It came out on Wednesday. This is Steve Ostrow's and Bob Anigstein's report. Now the report was dated March 29th --

DR. OSTROW: This is Steve. I apologize humbly, and the pages are also numbered incorrectly. We just discovered that about ten minutes ago. I apologize. The correct date of the report should be June 4th, and we'll correct the report in a day or so and just make sure there are no more typos in it.

DR. ROESSLER: Okay, I just wanted to make sure we have the right one, and I thought we did.

DR. OSTROW: Yeah, it says June 4th on the footer inside the report, but just the cover somehow got the wrong date.

DR. ROESSLER: Yeah, I see it on the footer that it's June 4th.

DR. OSTROW: That should be the correct date.

DR. ROESSLER: And I want to verify that Chris Crawford and Joe Guido have it and are

prepared to respond a bit later.

MR. CRAWFORD: Yes, I received it. This is Chris Crawford.

MR. GUIDO: And this is Joe. We received it, and we've reviewed it. We can make comments in an in-depth analysis, and we just got it a couple days ago so I don't think we'll need any more time before we can talk about it.

DR. ROESSLER: I want to remind everybody that the working group's assignment here is a site profile review. And as Steve states in his report, and I'm going to read from it, this issue, popularly referred to as the burlap bag issue, is the last remaining Linde site profile review issue identified by SC&A requiring resolution.

But my plan then today and since we have only an hour I asked Steve if he would, instead of going through the report thoroughly, to briefly summarize the pertinent points then we'll have NIOSH respond. And if we need to go into more detail on the report we can do that then. But if it's okay with everybody then I'd like to have Steve begin

his summarization.

BURLAP BAG ISSUE

DR. OSTROW: This is Steve. I'd be happy to do that. I'll give it quickly. First of all, apologies for two things: One, getting the report out so late, as I mentioned. It's one of those things we were going to issue like a week earlier. Every time we got the issue we found one more thing which took another day to resolve. It just kept going on. We just have to apologize for the typos.

That said, I'll just go through briefly what happened. We had our original site profile review back in July of '06. We identified a bunch of issues. Subsequently, after meetings and so forth, we narrowed it down to just one issue. This was on the burlap bag issue, burlap bag issue. That's what we've been focusing on.

We had a meeting on January 8th of this year, a working group meeting in Las Vegas, where we all met together, and we couldn't reach a consensus on how to treat this issue. On a subsequent technical call on February 13th with us and NIOSH and the Board and at that

time the resolution -- and one of the former workers was on that call, too. They did have a recollection of what happened.

NIOSH at that time was tasked to do a white paper basically to evaluate what the effect would be of a worker in the 1950s standing near -- a coffee break -- a pile of empty burlap bags every day for the year while he's having lunch. What's the dose effect of that.

And NIOSH produced its report then on March 29th. And the SC&A's -- It was March 18th, the NIOSH report. And SC&A then went ahead and took a look at that. We assessed that. We did some more calculations, and we produced this report we were just talking about, the June 4th report. That's our findings on the NIOSH report. That's a very brief introduction.

The NIOSH report basically looked at the dose to a person one foot away from the pile of African ore containing bags for one hour per day. This was supposedly on their lunch hour. And they relied primarily on a set of measurements that were made in 1944.

So African ore bags, and this is referred to as ^. This reference is either in the NIOSH report or the SC&A report in the 1944 timeframe.

And just doing a little simple multiplication, dose rates times time, NIOSH came out with an annual exposure of 1.5 Roentgens per year. That's just the gamma exposure. And NIOSH concluded in this report that the, right now their current dose model is an assigned dose of 1.85 Roentgens per year for workers in this 1950 time period.

So going back to NIOSH, the report concluded that right now they have an assigned dose rate of 1.85 Roentgens per year gamma with a geometric standard deviation of 4.04, and the 95th percentile value then is 18.5 Roentgens per year. So NIOSH concluded that their current assigned distribution encompasses the case if somebody were standing near the burlap bags on a lunch break.

SC&A took the report and we extended a little bit. Based on the teleconference, so called, that we had on February 13th, the particular worker had mentioned that he

thought they might have been sitting on the bags, too. So we looked at the case what would happen if the worker instead of being a foot away, was actually sitting on the bags.

And we went back. We looked at the Skinner* report again, which is a measurement, and we just did the simple multiplication also because they give contact doses based on top of the bag also, and we came up with 4.75 Roentgens per year gamma exposure which is higher than the NIOSH assigned dose rate but within their 95th percentile value. But so far we're just using measurements.

Then the other thought, well, if somebody is near the bags or sitting on the bags how about the beta exposure. So far they've just talked about gamma, but what happened to the beta exposure. And there was no measurements on that. We decided to do a calculation, and we used the MCNP Monte Carlo approach for both beta and gamma so we'd have a consistent calculation by using one code to calculate both of them. And the results appear in our report.

Appendix A of our report has the

average -- Bob Anigstein did -- has the actual calculation and the results of that. And the short of it is that we determined that the possible beta dose to a person, at least to his lower organs, could be significant. That it's around the same order as the gamma dose which has a conversion factor. Anyway, we thought that it was something that should be taken into consideration, the beta dose.

And the other thing is our calculated gamma dose rates came out significantly higher than the measured dose rates. And you might say offhand, well, a measurement is better than a calculation, but as our Appendix A discusses at the very end there are some reasons why we think the measurements might not have been that accurate. That's the basic summary, and that's where we are right now.

DR. ROESSLER: Thank you, Steve. That's a very good summary, and I think it's now appropriate for Chris or anyone at NIOSH to respond.

MR. CRAWFORD: Again, we've only had about a day and a half to look this over. We noticed a few things. First of all I'd like to go

back a little bit and remind everyone of the degrees of uncertainty we're dealing with here. We have a witness, a credible witness I'd say, who saw some burlap bags in Building 30, the warehouse, in August of 1951.

He was told but didn't know of his own knowledge that there was uranium ore in the bags. Now the last uranium ore received at Linde was 1946. They were through with uranium ore processing at approximately that time, and then they went into phase three which was uranium oxide processing. Uranium oxide was delivered in drums, but in different packaging.

So one basic question we have is, was it really ore in Building 30 in 1951. One of the reasons we question that besides the fact that it would have to be five year old ore that somehow wasn't processed at a time when the government was very interested in inventory control for uranium. Another factor is in 1950 there was a thorough, there was a report of an inventory of the building of sources. And Joe reviewed this in detail.

MR. GUIDO: It was a thorough survey of the

facilities of all the buildings, and it included that warehouse building. So I'll let you continue.

MR. CRAWFORD: And at that time in 1950 it's not very credible that they would have surveyed the whole building and failed to survey an obvious source like a pallet of uranium ore bags. There was no entry at that time for this. So there's a mystery of where the bags came from, what they contained and how long they were there.

We know again from the witness that by the time he returned from his Army tour in 1954 they were gone. So that's just one source of uncertainty. What was in the bags? When were they there and so forth.

And then we have the other questions of how many people actually sat on the bags for how long. The witness that we have wasn't actually stationed in Building 30. He was there for an inventory at least on one occasion. He put his coffee on the bags. He said that he saw other people sit on the bags but not for long periods of time. It's hard to quantify that.

Then to turn to a more technical aspect, the one thing we did notice in the SC&A report is they assumed a 70 percent African ore, 70 percent uranium content. And we know that the highest African ore grade that was received at Linde was 17.7 percent. Even at that level only one-third of one percent of all the ore received at Linde was that high a grade.

DR. ANIGSTEIN: This is Bob Anigstein. I got the 70 percent from the Mallinckrodt site profile, and it appeared that these were the same ores that were coming from the Belgian Congo. And they said that it was up to 70 percent. That was a quotation I believe from Eisenbud in 1954.

MR. GUIDO: This is Joe Guido. I believe there was a concerted effort to segregate where the very high grade ore went to because if you look at very early memos, I mean, they were very aware of the difference between an eight percent ore and a 70 percent ore as far as radiation exposure. And the TBD at the Mallinckrodt facility did handle that very high grade ore. So I guess I understand where

you got that from, but I would question, you know, we have no record of any of the stuff at Linde approaching that high a concentration.

DR. ANIGSTEIN: Okay, well that would certainly account for the difference. That would go a long way towards accounting for the difference between the calculated rates and the measured rates. I just went with the highest, to be claimant favorable, I just went with the highest rate that I had a record of.

MR. GUIDO: I would say once you --

DR. ANIGSTEIN: I took the highest concentration.

MR. GUIDO: Once you back that out, I would say that you basically have demonstrated that you can do a whole lot of sophisticated calculations to, you're in the same ballpark now.

DR. ROESSLER: Is that Joe speaking?

MR. GUIDO: Yeah, I'm sorry. I have to identify myself. I'm sorry.

DR. ROESSLER: Okay, thanks, Joe.

MR. GUIDO: Yeah, once you account for the change in the concentration I think we're basically talking now about the same thing.

DR. ANIGSTEIN: I agree.

MR. GUIDO: And as far as the beta dose rates get, we don't have the measurements, but those would scale down. But I think the important factor there is that the beta exposure rate is lower than the gamma. And the same methodology that we proposed to account for this scenario which is the GSC assigned in the Linde TBD, the same thing would go to cover any beta exposure for that point. Because the beta assignment is more than the gamma assignment, like 2.5. I'd have to look at the TBD. And it has the same GSC, so I'll let Chris proceed.

MR. CRAWFORD: Right, well, that comes close to wrapping it up. So our position basically is if there was ore present in those bags, if people sat on the bags, and if it was the most, the richest African ore that was actually at the Linde site, we still believe that the allowance that we've already made in the TBD more than covers the possible dose from this source.

DR. ROESSLER: Would that include then the beta dose that SC&A is discussing?

MR. CRAWFORD: As Joe has just said, yes, it would include the beta dose.

DR. ROESSLER: Are you redoing your calculations to include the beta dose or you feel that what you had before is a wide enough range to include it?

MR. CRAWFORD: We basically think we had a wide enough range with the geometric standard deviation as large as it was. That made sure that in the IREP calculations it would be taken into account at the 95^{th} percentile level.

DR. ROESSLER: And, Steve and Bob, how do you feel about that?

DR. OSTROW: Bob, do you have some comments on this?

DR. ANIGSTEIN: This is Bob. I would go along, I would probably, I haven't actually dug up that particular reference on the Linde ore concentrations, but I have to admit it is substantiated because there was something else about the yield in one of the reports I did look at. I think about the yield and the yield from the ore was certainly much lower than 70 percent.

As far as the IREP input, SC&A -- and I shouldn't really speak for SC&A, but my understanding is our position was that it is more claimant favorable usually to use the 95th percentile value as a fixed IREP input rather than putting in the entire distribution. Because for any given worker, we don't know that he could be at the, near the top. I know we'd raised this issue some years ago, and I thought that that was a common practice now to use the 95th percentile as a fixed value.

DR. ROESSLER: Maybe Jim can answer that.

DR. NETON: Bob's right. I mean, the 95th percentile given the known, given that there's a known exposure scenario. But I think as Chris has pointed out here these are sort of ifs on top of ifs on top of ifs. So no one is really certain at all that these exposures actually even occurred. But I think to sort of assume that they occurred in the absence of any positive evidence, I think it's sufficiently favorable to use the distribution in this case.

DR. ROESSLER: Well, I guess it's at the plan then in doing the dosimetry is that for

any worker who was present during that time that you assume a certain time sitting on the bags and do the calculations then as the 95th percentile?

DR. NETON: Well, I think that would be SC&A's opinion. But I think -- correct me if I'm wrong, Chris -- but I think that's not what we're suggesting.

MR. CRAWFORD: That's right. We believe that the existing TBD makes quite an adequate representation of the possible dose received by the workers during the latter period.

MR. GUIDO: This is Joe Guido. I want to make one comment, too. There's two issues here. One is what is the site profile guidance for dose reconstruction. And then the other issue is how is a dose reconstruction actually done by a DR. And one comment I want to make is if in a DR report there is evidence that exposure scenarios that were abnormal, were not in the upper tier of some kind of scenario, not just this one but any scenario, you know, that information is looked at by the dose reconstructor and is addressed in the report.

So the technical basis document provides guidance and scenarios on the more general scenario and is geared towards being claimant favorable and covering in general. And then if there is specific information about a specific DR that's being reconstructed, that information is considered.

And so I guess what I say is we really wouldn't want to treat every single Linde employee as if they spent their lunch hour in that building, which was a warehouse, sitting on that pallet of bags. But if there's that information was specifically put forward, it would be addressed in the dose reconstruction report.

And I have not seen a CATI that has said that, but I just want to make sure I remind everyone that that is a two-step process. This is really getting to very specific scenarios that should not be assigned to every worker, I would think.

DR. ROESSLER: It seems where we're at is that SC&A has made some suggestions which it appeared to me might ask NIOSH to revise the site profile. And I think what Chris and Joe

are saying is that the site profile guidance and the language as to how the dose reconstruction would be done does cover all SC&A's concerns. Am I getting that right?

DR. OSTROW: This is Steve. It sounds like it. I don't think we disagree now. We haven't done the recalculations with rescaling of our calculations for lower concentrations of uranium which we could probably do fairly quickly. But assuming that we do the rescaling it sounds like we don't disagree technically with NIOSH about the actual dose rates. We're in the same ballpark on calculated values and their measured values.

This turns out to be not so much a technical issue as a procedural issue. And this I don't know if we make the call or NIOSH makes the call or the Board makes the call on this. Which scenario do we take? Do you consider that the situation is a hypothetical exposure from maybe sitting on top of the bags for a whole year?

Is that credible enough that you would take the 95th percentile value? Or is it incredible enough that you may just want to go

with the mean. It's not really that much of a scientific issue now.

MR. GUIDO: Hey, Steve, this is Joe Guido. I want to just clarify because for the meeting notes here if we were to say that someone did spend an hour a day on those bags, when we talk about the 95th percentile, what we're talking about is the default. The technical basis document provides an external dose assignment of the 1.85 rem with a GSD of 4.04. That assignment covers all exposures at Linde.

So if we say that input of that parameter into IREP as a distribution, which is currently a practice, does not cover this scenario, we would not, I don't think we would want to assign the 95th percentile of that distribution. What we would do is we would add on top of it an assignment just for the bags which would be -- and I'm not saying we should do that.

I'm just saying, I just want to caution that what the alternatives here are not do what we're doing now or assign the 95th percentile. It's really do what we're doing now and assign an additional exposure which

NIOSH believes is already accounted for in the distribution.

DR. OSTROW: Okay, thanks for the clarification.

DR. ROESSLER: I'm a little bit unclear as to where we stand. I think what I'm hearing from Steve is that SC&A is accepting the site profile.

DR. OSTROW: Subject to a little bit ^. We're doing this sort of in our heads now. If we have the lower African ore concentrations, we think that we end up in the same ballpark, but that would require just a little bit using a calculator to make sure.

DR. ANIGSTEIN: This is Bob Anigstein. Would the working group like us to reissue -- this would be a very small amount of work -- reissue this report correcting or scaling down the concentration? I see we also have a couple of typos that we wanted to fix anyway so while we're at it we can scale down the concentration. And if Joe can give me, perhaps by e-mail, that exact location of the concentrations for Linde, I had missed that. Is that in the Linde site profile?

MR. GUIDO: Table 20.

DR. ANIGSTEIN: Pardon?

MR. GUIDO: That's Table 20.

DR. ANIGSTEIN: Oh, okay, great. I will look at that and also take into account so if this is what the working group would like SC&A to do, I would say by tomorrow we could probably have a new revised report out for you.

DR. ROESSLER: I think that would be the approach, and I'm going to ask for a response from the other members of the working group. But it would seem that this could be accomplished and we could have a resolution on it by the time the Board meets in St. Louis.

DR. ANIGSTEIN: Excuse me, tomorrow, tomorrow's Saturday. I meant Monday.

DR. ROESSLER: Yeah, by Monday. I know Josie and Mike and I hope Jim are still on the line. Does any one of you have any reaction to this approach?

DR. LOCKEY: Jim Lockey, I concur. It sounds like a reasonable approach to me. We can wrap this up.

MS. BEACH: This is Josie. I also agree

with that approach.

MR. GIBSON: This is Mike. I agree.

DR. ROESSLER: What about let's hear a response from NIOSH as to what the timing and the approach on this.

MR. ELLIOTT: This is Larry Elliott. I think you've taken the right approach. We would appreciate seeing SC&A's report revised to show their agreement or whatever aspect they disagree with us on and hopefully we'll be all in one place.

DR. ROESSLER: So on the timing if we all get the revised report on Monday -- I'm thinking ahead to the St. Louis meeting -- I would like to be able to bring a final conclusion to the Board at that time.

Do we, Larry or Steve and Bob, do you think that we're going to have to have the working group get together before that time? I'm not quite sure what the proper approach is.

DR. OSTROW: I'm trying to think it through. Let's assume that our report technically agrees with NIOSH's measurements, and we're in the same ballpark. Then we still have this

little bit difference of opinion of exactly how to treat the potential exposures.

I'm not quite sure how to resolve that, you know, for the bag scenario. Whether NIOSH's approach as I understand it would be that let's keep it the way it is now and any possible bag scenario would be subsumed in their current guidance. The other approach would be to have a special case for the bag exposure.

Joe, did I state that right?

MR. GUIDO: Yes, yes. I mean, if you make the opinion that the current distribution does not cover this event, then you would have a separate line item for that.

DR. ANIGSTEIN: This is Bob. I think maybe that we need to confer internally in SC&A before we make a conclusion on this.

MR. GUIDO: Hey, Gen, a point of order. When is the St. Louis meeting? I don't keep track of those very closely, just for my own schedule.

DR. ROESSLER: But I think it's June 22nd.

MR. ELLIOTT: The meeting in -- oh, go ahead, Chia-Chia.

MS. CHANG: The meeting is on the 24th, 25th and 26th of June.

MR. ELLIOTT: As far as NIOSH is concerned, our position is that our site profile currently addresses this kind of special, unique exposure scenario. And so if SC&A comes forward with an alternative suggestion to that, we would consider it. But at this juncture we are not in a position to say we feel we should change our dose reconstruction approach.

DR. ROESSLER: But it seems at this point then we need to allow Bob and Steve and SC&A to think about this a bit. And I think it would be appropriate to include your evaluation of it when you send in your revised report.

DR. OSTROW: Okay, we can do that. We can do our revised report, the technical part and then we'll have a recommendation at the end of it. We'll recommend what we think what the course of action should be.

DR. ROESSLER: Okay. It would seem that one approach that would be simple if you agree with it is that SC&A's site profile and their

approach to the dose reconstruction is acceptable. The other alternative would be, if not, what you would suggest, and then we'll have to go back to NIOSH and get their response.

DR. OSTROW: Okay, that sounds right.

DR. ANIGSTEIN: This is Bob. I'm just looking at the calendar. I would just like to revise the commitment to having it by early Tuesday because this gives us time for internal review, if that's okay.

DR. ROESSLER: That sounds good because Tuesday is still, we still have quite a bit of time. So let's take the next step, look for your report on Tuesday, and you'll be sending it to NIOSH as well as to the working group.

DR. ANIGSTEIN: Yes.

DR. OSTROW: Right.

DR. ROESSLER: And after that happens then I think we'll have to decide where to go from there. If it looks like we need to have another meeting like this, we'll have to call one at the soon as possible time.

DR. OSTROW: Okay, if we decide that after our conclusion that NIOSH's approach is

acceptable, I think that closes the issue.

DR. ROESSLER: Then it closes the issue. And then I'm assuming from what I've heard from the working group then they agree that everything is acceptable, and we'll report that to the Board in St. Louis.

DR. OSTROW: Right.

DR. ROESSLER: Does anyone have any, have we missed anything here or does this plan look appropriate?

DR. LOCKEY: Jim Lockey, I think it sounds very appropriate.

DR. ROESSLER: Josie and Mike, any comments?

MS. BEACH: I agree.

DR. ROESSLER: Larry --

MR. GIBSON: That's fine.

DR. ROESSLER: -- NIOSH people, does this look like the right approach?

DR. NETON: Sounds good to me.

MR. ELLIOTT: Is it okay with you, Chris?

MR. CRAWFORD: Yes, fine with me.

MR. ELLIOTT: I think we're fine with it, Madam Chair.

DR. ROESSLER: So it looks like we have finished our meeting for today. Jim can now

drive safely, and we'll wait for the report to come through on Tuesday and decide where to go from there.

DR. OSTROW: Okay, very good, SC&A is happy.

DR. ROESSLER: Thank you for your good work, Steve and Bob --

MR. ELLIOTT: Thank you all.

DR. ROESSLER: -- and we'll talk later then.

(Whereupon, the working group meeting concluded at 10:40 a.m.)

CERTIFICATE OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of June 06, 2008; I, Steven Ray Green, then transcribed the proceedings, and it is a true and accurate transcript of the testimony captioned herein.

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

WITNESS my hand and official seal this the 27th day of July, 2008.

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STEVEN RAY GREEN, CCR, CVR-CM, PNSC

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102