US Department of Health and Human Services
Centers for Disease Control
National Institute for Occupational Safety and Health
Advisory Board on Radiation and Worker Health
Santa Susana Field Laboratory Work Group
Monday, December 3, 2018

The Work Group met telephonically at 10:30 a.m. Eastern Time, Phillip Schofield, Chair, presiding.

Members Present:

Phillip Schofield, Chair
Henry Anderson, Member
Josie Beach, Member
Bill Field, Member

Also Present:

Ted Katz, Designated Federal Official
Nancy Adams, NIOSH Contractor
Bob Barton, SC&A
Terrie Barrie
D'lanie Blaze
Rose Gogliotti, SC&A
Milton Gorden, SC&A
Monica Harrison-Maples, ORAU Team
Lara Hughes, DCAS
Jim Neton, DCAS
Dennis Strenge, ORAU Team

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Proceedings

(10:32 a.m.)

Welcome and Roll Call

Mr. Katz: Welcome, everyone. It's the Advisory Board on Radiation and Worker Health, the Santa Susana Work Group teleconference. And this Work Group is addressing both, two petitions, both for Area IV Santa Susana first and also for De Soto Avenue, two separate petitions so I'll get to those, I think, in that order.

The materials that are available for the public and petitioner and others are posted on the NIOSH website, for one. They should have been sent to the petitioner as well. Under missed programs section of the website, schedule of the meetings, today's date filled in, you can find those in the agenda, which is pretty much what I just told you with a little more detail.

There is an SC&A report that just was at the last minute cleared by DOE, so that is not on the website yet but it will get posted as soon as it can. It will also be sent to the petitioner as soon as we can get that out to the petitioner. And there's a presentation based on that. That presentation is also not on the website yet but we'll get it on the website. The Work Group Members had it and I sent it to the petitioner. I'll check in with her when I get to her on the roll call. Make sure that she got it, I sent it to her right after it was cleared.

Let's get on with the roll call. We're talking about a specific site, so please speak to conflict of interest, it doesn't apply with respect to the Board Members because they all are, sort of by definition they don't have conflicts of interest to be on this Work Group. The Work Group is chaired by Phil Schofield, who's

present, and the Members of the Work Group are Henry Anderson and Josie Beach and Bill Field and again, they have no conflicts of interest. They're all present, so we have the full Work Group on the line.

(Roll call.)

Mr. Katz: I want to just remind everyone to please keep your phones on mute except when you're speaking and press *6 if you don't have a mute button to put your phone on mute. *6 to come off of mute, and please don't put the call on hold. And with that, so, it's your meeting.

Chair Schofield: Good morning, everybody. I guess we'll just start off with DCAS and their White Paper, their Air Data Summary paper they issued.

I don't think that's been cleared yet, has it?

Mr. Katz: Yeah, that's public, that's on the website.

Chair Schofield: Okay.

Mr. Katz: So that's Lara.

Area IV SSFL SEC petition

DCAS White Papers & SC&A review

Dr. Hughes: Yes, hi, good morning everybody. I do have a presentation and it's up under the presentation link of this meeting. Unfortunately, this presentation has not been finalized on the NIOSH website, it's still undergoing final accessibility review. It's the same presentation I will present next week at the Board meeting.

If you don't have it, I don't think it's a big deal. I'm just going to go over the content of the two White Papers that we recently sent to the Santa Susana Work Group, and all this information will be

presented again next week.

This is regarding Area IV of the Santa Susana field lab. This is a site in Ventura County, California. You all are pretty familiar with it, I suppose, at this point. The DOE-covered period for Area IV is 1955 through 1988, and there's a remediation period from 1989 to the present.

There are several existing SEC classes for Area IV that have been added to the SEC. Three of those encompass the entire operational period, so the entire operational period from 1955 through 1988 are SEC classes at this point. The latest SEC-234 was added to the SEC based on insufficient data to assess intakes from thorium and americium radionuclides.

There was SEC-235 that was evaluated last year. This qualified for evaluation from August 1, 1991 to June 30, 1993, based on the issue with the bioassay contractor, Controls for Environmental Pollution. This NIOSH evaluation, SEC evaluation, was presented to the Board in August, 2017, and no class was recommended.

This was followed up by a more detailed discussion off this evaluation with the Area IV Work Group on December 4, 2017. From that meeting, the Work Group requested that some additional work to be done on NIOSH on two specific issues.

One was the, what was the status of thorium and americium operations in the post-1988 period in light of SEC-234, which we added the cost based on those two radionuclides, and also to shore up the CEP period, as we call it, this period where we don't use bioassay by looking at what the available air sample data during that period looked like.

NIOSH issued two White Papers on November 1, 2018, so about a month ago, and they have finally

been cleared and they are available on the NIOSH website. Unfortunately, a redacted version, but I think that the Work Group has received the full unredacted version. We had to take a lot of personal identifiable information out.

Let's look at the remediation period for Area IV. What was the status of the site after 1988? There were three facilities that were from a radionuclide exposure standpoint the major players, and that was the hot lab, Building 20, the radioactive material handling or disposal facility, which was an active facility, and the SNAP reactor facility.

The hot lab and the SNAP reactor facility were two, one was a formal reactor facility, the hot lab was a hot cell facility, just being dismantled. The main radionuclides of concern during this D&D period were fission products, mostly cesium-137 and strontium-90. The hot lab had to deal with the residual alpha activity in the form of plutonium-239.

In the SNAP reactor facility the major issue was activation product, cobalt-60. This was based on the nature of the operation of these facilities, not the only radionuclides present, obviously, but the main drivers of the radioactive protection, the health physics protection program.

We looked at the status of the operations for thorium and americium after 1988. All reactor facilities had ceased operation and reactor operations ended by 1980, so several years before. The nuclear support operations ended by 1988.

Pre-1988 during the operational period, the thorium source term consisted of reactor fuel components, thorium was a component of the reactor fuel of the SRE and the AETR reactors and there was also a thorium exposure potential based on the nuclear

support operations of the fuel assembly and the fuel handling and storage or disassembly after it was taken out of the reactor.

The americium source term pre-1988 consisted of the transuranic in all of the used reactor fuel and the several fuel sources that were present at the site. I'd like to add that the issue with the americium source term during the operational period is not so much the quantity, that was a huge quantity, it's more so that we can't quantify the source term.

We looked into some detail of the thorium operations, where they were done, and what was the status of those facilities during the remediation period. The thorium fuel for the SRE was present in what they called Core II, they had three different cores for this reactor, I think the last one was not being used but this core was in operation from 1960 to 1964 and consisted of thorium-232 and enriched uranium alloy.

This core fuel was assembled in the engineering test building. The Core II fuel was stored in the radioactive material handling facility or disposal facility after it was removed from the reactor in 1964. Starting in 1974, ten years later, this Core II fuel was disassembled in the hot lab and it was shipped offsite in 1977 with pretty detailed reports on this, where the fuel came from, where it went. The engineering test building, the building where the fuel was assembled, was released for unrestricted use in 1985.

Then the other reactor, the TR -- AETR, the Advanced Epithermal Thorium Reactor operated from 1960 to 1974. This also had thorium-containing fuel. The fuel was fabricated at the reactor building in 1959 and this building was released for unrestricted use in 1980.

We looked through the incident database and other records that are available to NIOSH and we found no incidents involving thorium listed in the remediation period.

For americium, again, all reactor fuel was removed from the site by 1988. The Transuranic Management by Pyropartitioning - Separation Program used americium and other isotopes. This was a program that was supposed to be done but it never got off the ground. At least that's what the records indicate.

There are some americium materials that were received at Area IV and were kept in storage and were later shipped offsite without being actually handled or used. Any incidents that are listed mention americium use only before 1988 and the only two facilities were some residual contamination from americium or the transuranics is possible is the hot lab and the radioactive material handling facility.

We reviewed the records of, the decommissioning records and quarterly review reports on those two facilities during the remediation period and they do not indicate any evidence that americium or thorium were encountered at these facilities or that they were in any way were the drivers of the radiation safety program.

In conclusion on the thorium/americium status, the major source term for americium/thorium first terms for americium/ thorium had been removed from the site by 1988, which is the nuclear reactor fuel. A detailed review of facilities during the remediation period does not indicate a sustained radiation exposure similar to the operational period.

The D&D operations could produce unpredictable exposures but the site had an internal exposure monitoring program that was driven by air sampling

and NIOSH does not find that the exposure potential from the operational period continued into the remediation period.

This was the White Paper I that was sent to the Work Group. I do not have my presentation broken up in two separate ones. If you have any questions, if you want me to stop and discuss White Paper I right now, or I can continue with the presentation, with the air data, and then we do questions and discussion afterwards. Which one do you prefer?

Mr. Gorden: This is Milton Gorden from SC&A. I think we're good to go paper by paper if that's okay.

Dr. Hughes: That's fine.

Member Beach: I agree. I was going to say that too.

Dr. Hughes: Okay.

Mr. Barton: This is Bob. As I said, we don't have an official review on these White Papers yet but we have been going through them. Milton Gorden's on the line and he's really taken a lead on them and looked at some of the underlying documentation and we certainly have some questions, clarifying questions really about what NIOSH's intended approach is based on these White Papers, so I'll turn it over to Milton.

Mr. Gorden: Okay. I guess my first question would be about the SNAP reactor, if it was undergoing D&D. But the paper didn't really address that at all. Is that because of what source term there was is related more to activation products that you found, or do you have any other reasons why you didn't address SNAP, really?

Dr. Hughes: The SNAP reactor did not have thorium fuel. We mostly, this was mostly focusing on the

thorium and americium.

(Simultaneous speaking.)

Dr. Hughes: The SNAP reactor facility was undergoing D&D, yes, but it was, you know, this was the building, the activated concrete and steel structure. There was no, the reactor itself was not there anymore. It was just the building that was undergoing D&D. I guess I didn't make that clear. I'm sorry.

Mr. Gorden: That's okay. They did do a lot of surveying. I was looking at one of your references, had all kinds of surveys from that period and then '91 paper I was looking at. They did have, what localized they, in case you want to give them a pass, high alpha contamination they had removed. Mostly, I guess, from the hot pads but do you come across anything at all that would, I guess, characterize the alpha contamination? I know occasionally they would say, Pu-239 and strontium-90 in a couple of places but ---

(Simultaneous speaking.)

Dr. Hughes: Right. They did smear surveys as well as they did stacks, well, it's mostly the hot lab but the general survey was based on, they did the gross alpha, gross beta and then they use the limit of what they call the radionuclide of concern, which they used plutonium-239 just because it's, I think it's the most limiting radionuclide. Generally their survey information is presented in gross measurements and then is compared to what they're using after limit to compare it to to see if any kind of action is required.

I think with, this is mostly with regard to the air data, if they saw an elevated, if they saw a sample that was, I think, within 25 percent or 25 percent of the limit, they would do a special analysis for

radionuclides, for specific radionuclides. I mean, we have not seen any indication that they saw thorium or americium during that time.

Mr. Gorden: Okay. In regards to the incident reports you looked at, can you tell us where they are, I guess on the CDC drive? We were having trouble finding them.

Dr. Hughes: They're on the site research database. Do you have access to that?

Mr. Barton: This is Bob. I actually, yeah, I think it's page 5 of the White Paper, it says, "There are no listings of incidents involving thorium or americium during the post-1988 period, but not all incidents list the nuclide of concern," and then there are three references provided.

We could find the last two, I guess, cited as Incidents 1980 and Incidents 1990. We went through that. It's something like 500 pages of documentation but we only saw about 33 incidents that were actually related to this post-1988 period, and only two instances actually mentioned the contamination or even survey results for alpha.

One was a wound incident involving a plutonium glovebox and the other one was sort of, the infamous lost TRUMP-S material which wasn't really lost, but I think we'll get into that a little bit with the DeSoto discussion. Everything else was basically incidents related to beta gamma they found with a GM probe or some other external radiation monitoring device.

Now the third reference, which is cited as SSFL 2007, when we went to the SRDB for that, it said that that information cannot be indexed but can be found at a location on the internal CDC O drive. However, we couldn't follow that link to really find where that, I guess, incident database was actually located. In

other words, the address given in the SRDB document, we couldn't really see that.

Mr. Katz: Bob?

Mr. Barton: Yes?

Mr. Katz: This is Ted. For items like this, where you're just trying to track down where's the reference, I think you can just shoot Lara an email and that would be much more efficient than anything else. That's just a mechanical issue of getting you to references that you can't find or whatever.

Mr. Barton: Sure. I understand.

Dr. Hughes: Yes, because ---

Mr. Barton: What I really wanted to point out was that we say that, or at least one thing that would concern me, is we're saying that there are no incidents involving thorium or americium but in looking through the incidents that we have in front of us, there are basically, they found external contamination and they cleaned it up, and they didn't really talk about what the contamination was except for those two incidents I just discussed. One was a puncture wound in a glove box and one was the TRUMP-S material that arrived and was briefly unaccounted for.

So I, you know, when we say that there's no evidence that the thorium or americium is there, that's true but I would also point out that there's not a whole lot of information about what the alpha contamination was. I think that's something that Milton was trying to point out as well, and there are incidences of alpha contamination.

We can say that the driver's really the plutonium, but I'm not sure, well, at least from our side, if we're

comfortable saying that the americium and thorium source term was simply not there anymore. I mean, it was there in 1988, that's why there was an SEC there for americium and thorium, and then they started carrying out all this equipment that, you know, what about all that contaminated equipment?

We have evidence of alpha contamination but they don't necessarily identify what it is, so it's at least difficult from my view to say that it couldn't be americium or thorium. That kind of leads me to what my main question is, in the conclusion of this White Paper, is it NIOSH's intention that we're not going to be assigning any sort of dose to these potential contaminants, or are we saying that after 1988 if it's there it certainly doesn't rise to the level that warranted the SEC in the first place up to 1988?

In other words, is there a plan for a dose reconstruction approach in the future, or are we saying that that source term simply didn't exist anymore and therefore it doesn't have to be accounted for?

Dr. Hughes: Well, we do have a dose reconstruction approach and we're not planning on developing a new one in the sense that the remediation period is not currently an SEC because we found no infeasibility so we will continue to do dose reconstruction for this period based on available, largely bioassay data.

Mr. Barton: Specific to thorium and americium, though? Or ---

Dr. Hughes: Typically we assign, I don't know, dose reconstruction, it will assign, any internal dose reconstruction we usually assign based on a limiting radionuclide, whichever was most claimant-favorable, and I don't think that's currently americium. I don't know, we have our, we have some

support staff that's more familiar with dose reconstruction. Dennis, if you're on the line, could you weigh in on what, do we typically use thorium or americium?

Mr. Strenge: Well, when we do the dose reconstructions we usually go with the bioassay data that we have but of course for some, up to '88 we have the internal dose reconstruction coworker study that we would apply also. The exposures after 1988 are typically very small and we don't usually have very much bioassay data.

Member Beach: And this is Josie. Bob's correct, though, that one line in your conclusion says that the facilities were undergoing D&D and the exposures were unpredictable. If you weren't looking for it or if they weren't looking for it, certainly you wouldn't see it. So you have to account for that thorium and americium somehow.

Dr. Hughes: Well, based on our review of the air data, they were only, they were surveying with gross measurements but once they identified an elevated reading they would go ahead and identify. But I have not seen any evidence that they did identify americium or thorium, but that may also be we have not looked at the raw data. We only looked at quarterly summary reports.

Member Beach: Lara, could you remind me why you cut off the SEC at '88? What did you find in '88 that concluded that it was ---

Dr. Hughes: It was the end of the operational period.

Member Beach: Okay. So it was just simply the operational period.

Dr. Hughes: Yes, as you can see from the, there's a graph in the White Paper that kind of shows the

reactor operation actually ended in 1980 and then there was a period where they removed the fuel from the site. So we made it out all the way to 1988. That's not saying that there was a huge exposure of thorium/americium in 1987, in fact I don't think there was. But we just kind of extended the class out because it's really an unknown source term but we felt like 1988 was rather conservative.

Chair Schofield: Do any of these incident reports or surveys break it down into fixed versus renewable contamination in the levels?

Mr. Barton: We have not surveyed that. I mean, I looked it over but I have not, I don't have a detailed summary of that right now. We typically, when we do data capture for the site and this period, we did not focus on this level of data. We mostly look at air data and bioassay data.

The smear samples will be reported, they will be reported in dpm, so I think they most likely went with the same operational, the same procedure if they're, if they pick something up they'll probably go ahead and do isotope analysis but I have not seen it.

Mr. Barton: Could we again go back to sort of the mechanism that NIOSH has plans to use? Again, I just wanted to clarify that this White Paper is essentially establishing NIOSH's position that dose reconstruction to this particular source, there's no infeasibility, that's the conclusion of the White Paper, I think, but I guess I'm still not quite clear on what NIOSH would plan to do in an actual dose reconstruction.

The coworker model was mentioned, which I believe is TIB-80, but I don't recall that being specific to americium or thorium, so I'm wondering how that would actually work.

Dr. Hughes: We get bioassay data from a worker. We're not using bioassay during the CEP period but bioassay data will be reported as a reading from the bioassay contractor and they analyzed for, I think what we get is various forms of uranium, mixed fission product, plutonium, let's see, so we will take the urinalysis result and do a --- What we do in our dose reconstruction process, we have this program that will take the bioassay result and then we kind of interpolate what the workers, what period this bioassay sample represents and we calculate an intake of this radionuclide in question and then from this intake we calculate the dose that this worker may have received.

If it's not clear what radionuclide it was we'll usually, like if say it's plutonium, we will assign the most claimant-favorable radionuclide, whichever will result in the highest dose.

Mr. Barton: And I agree that that's true if you have, I guess, gross alpha urinalysis, you could do that sort of comparative where you select the most claimant-favorable radionuclide, but I guess I'm more asking towards the worker with limited or no internal monitoring data. Again, there's a coworker model and like you said, the coworker model was developed for fission products and uranium and maybe plutonium as well.

How would you account for the potential for someone who's out there ripping out this equipment that had been used potentially for any sort of research with americium or thorium, how would that be accounted for? I understand the position that the same exposure potential did not necessarily exist or it would be different in the operational period versus the residual period to some extent, but again, and perhaps this is down the road, a discussion for down the road, but I'm still not sure if you have an

unmonitored worker who is involved in these D&D activities, how would those be accounted for?

Dr. Hughes: Right. We have not seen, either we have the coworker model and we would have a worker's own either air data or bioassay data. I don't, at this point from my detailed review I do not think there are a lot of workers that were unmonitored that were in the thick of the D&D operation.

There were workers onsite that weren't monitored, that is true, but the people that were breaking out the drain line from the hot lab, they wore respirators and they were monitored based on all accounts that we have seen in the reports from the site. So any kind of dose reconstructions will be based on available worker dosimetry data which I actually did have thorium available during that time period.

Mr. Barton: So there are actual thorium bioassay results?

Dr. Hughes: Yes, there are. We did not, they're not sufficiently abundant to be put in the coworker model, but yeah, we do have some. I can't speak to americium, I'm not sure right now but they did monitor for thorium. We might have one or two results total. I mean, it was not, we're not talking about a large group of workers here.

Mr. Barton: I guess that leads me to say we're actually monitoring a couple of workers. Clearly there was some concern.

Dr. Neton: Lara, this is Jim. Are you speaking of the monitoring in the cover period, not the residual period?

Dr. Hughes: I'm speaking of the residual period, but I'm not exactly sure because we have not really focused on the bioassay data at this point. Let me

phrase it that way. I know they had a contract with the bioassay vendor that came in after CEP, and that contractor had the capability of monitoring for thorium. I'm not sure we actually have the data at this point. I thought I saw it at some point but I'm not sure what time period we're looking at.

Mr. Barton: Okay. So I guess just to sort of summarize this discussion, it's NIOSH's position that if the workers during the residual period have data that that can be interpreted to potentially account for thorium exposure and that if you have an unmonitored worker then it's going to be assumed that that person just was not exposed.

Dr. Hughes: That's correct. Keep in mind the infeasibility for thorium and americium, especially towards the end of the operational period. It's not so much that we found that there was a huge concern of the quantity of the source term, it's more like that we couldn't really quantify the source term. It was one of those things we just based on the available data.

We couldn't quantify it so, but the most of the source term being removed after the operational period which did not see that there was, there's not the same material available on the site. So whereas the D&D could open up something, it just doesn't look like there's the same type of source term available during the remediation period that we felt this was infeasible. We have not seen that in any of the claims or dose reconstructions, as far as I know. At least not the ones that I have reviewed.

Mr. Barton: Okay. And then, again, these, we just wanted to really understand what NIOSH's position was and that is that there's no infeasibility. Now you mentioned that the workers involved in D&D, they all wore respirators and had, I guess, lapel breathing

zone samplers, that kind of thing, and that that data is available in the DOE-supplied files for all these claimants?

Dr. Hughes: The breathing zone data is not and the DOE-supplied files, no. We have to go look for that.

Mr. Barton: I guess that's kind of leading into the next White Paper so maybe we can discuss that with the air sampling issue White Paper. I guess I clarified NIOSH's position of, for me. Milton, do you have any other questions for DCAS?

Mr. Gorden: No, I think that pretty thoroughly covers it.

Mr. Barton: Okay. Unless the, certainly if the Work Group has more questions, otherwise I suppose we can move on to the next White Paper.

Member Beach: Yes, I'm good with that. This is Josie.

Chair Schofield: I don't have any additional questions.

Member Field: This is Bill. My only question is is SC&A going to do a formal review, to take a formal review in findings, look for findings?

Mr. Katz: Yes. This is Ted. Yes. I just, the NIOSH reports weren't ready until November, so it's just a timing issue.

Member Field: Okay.

Mr. Barton: That's obviously correct. We wanted to be able to sort of ask some of these clarifying questions so we understand what the real intention is behind these White Papers and the process going forward, and we will submit an official review on these matters as soon as we can.

Mr. Katz: Thanks.

Dr. Hughes: Okay. Let's move on to the air sampling White Paper. Again, to reiterate, these White Papers were produced by request of the Board and the Work Group to clarify some items from the SEC-235 evaluation.

The second question that was raised during the Work Group discussion about a year ago was since we're not using the bioassay data controlled for environmental pollution, that we should shore up this gap. It's roughly a two-year period that we should shore up with available air data. Air data is not, it's something we generally look into however we don't typically collect all of it during data capture because often it just represents a huge quantity of information.

So we don't have any raw general air of breathing zone data from Area IV, but we do have quarterly summary reports that summarize the available air data and this is what was used to develop this White Paper.

During this 1991 to 1993 period and several quarters before and after this period, we looked at general air sampling results. Those are fixed location air samplers. They report weekly results and then the quarterly reports, they report one quarterly result which represent about 13 weekly results.

Breathing zone air sampling is what's worn by a worker during our entries into high air contamination areas. This worker may or may not wear a respirator, depending on the expected contamination. The results from breathing zone and general air data are compared to a maximum permitted air concentration, or MPC for the radionuclides of concern at the time.

During the D&D period the radionuclides of concern

were stronium-90, for presenting beta emitters with a limit of one times ten to the minus nine microcuries per millliliters and plutonium-239 for alpha with an MPC of two times ten to the minus 12 microcuries per milliliter.

For breathing zones, those were compared to the maximum permitted air concentration, our limit of 2000 per year or 520 per quarter and until 1992, actually the site stipulated that air sampling was the primary exposure assessment method and bioassay was used as backup. So when it was expected somebody would have an intake based on breathing zone or air data they would order bioassay.

I've prepared a little operational summary. I probably should have given that at the beginning of this, but this is how the White Papers are structured. What was going on during 1990 to 1993 at the site with the D&D, the SNAP reactor, the T059 building, we have air data available for 1991 for four quarters.

The facility is undergoing D&D and the main contaminant encountered there is cobalt-60. The main operations that were going on this period is that the structural steel of the facility and the irradiated concrete are cut to smaller pieces and sent to the radioactive material disposal facility for interim storage until the material is shipped offsite.

Again, to reiterate, the reactor, the actual reactor, the fuel and the reactor parts have been removed from the site at this point. We're dealing with the building itself that's being dismantled.

There were some airborne radionuclides observed during the removal of old sodium potassium coolant lines. The workers were breathing zone samples during operations causing airborne contaminations. There was no general air data in the SNAP building.

They were relying on breathing zone only.

For the hot lab, we have air data available for 1990 to 1993 for 15 quarters. This facility had 28 general air samplers that recorded air data for every quarter. Workers with potential for intakes were breathing zone and respirators if needed. This was the facility with the largest number of breathing zone data available.

The D&D operations during this period mainly consisted of the removal of cell liners and drain pipes. Some incident reports indicate small events of contamination.

When we looked at the general air data points, there was a period in 1993 where we saw some quite elevated general air data. We looked at this in some more detail trying to figure out what was going on, and I'll talk to that in a little bit. We found any potential intakes could be assessed based on available whole body counts and bioassay data.

The radioactive material disposal facility was an operational facility in this time. It was not undergoing D&D. We have air data available for 1990 to 1991 with one quarter missing. There were seven fixed general air samplers at this facility and there's breathing zone data for up to ten workers per quarter available.

The site, operations at this site consisted of receiving material from other areas at Area IV. They did site-reduction packaging, storing and shipment of materials offsite.

Do most of you have the presentation in front of you? Well, anyway, if you have the White Paper in front of you, there is a figure that actually goes back to the operational period. We looked at some annual summary reports and pulled out the annual average

air concentration for the hot lab during operational period, and we plotted that.

For years, we have years 1975 through 1988 available and we compared that to the maximum permissible concentration at the site and there's only one year, 1985, where they reported an average above the limit that they set or that they had. There's no indication of why this limit was exceeded or what the operations were. At least we didn't do any research into what that was. It was mostly collecting this data just to compare it to what we saw during the remediation period.

Also what this shows is that from 1986 through 1988 the annual average went way down, which probably related to operations winding down. However, once we get into the D&D period we see the air data picking up a little more.

So when we looked at the, what is the maximum quarterly average, so these are the, an average of 28 air sample locations in the hot lab. They're averaged together per quarter and they used the maximum reading at every location, as I understand, and then they reported on these, someone did an alpha reading and there was a reading for alpha and a reading for beta emitters on this.

Then this was compared to the respective alpha MPC and the respective beta MPC. We plotted this for all the quarters from the first quarter in 1990 to the fourth quarter in 1993 and it all looks fine, so all the data are below their respective MPC with the exception of three quarters in 1993 where we see some really, really high air data. We did not expect that.

Of course we tried to figure out what the matter was with this, why did they report these high air data? We

couldn't find any information there so these results are reported in the quarterly reports but they're not discussed in any way. They just kind of didn't seem like, it didn't trigger an incident report or any kind of detailed analysis, so we're not quite sure what to make of this but I'll try to explain it a little more in a minute.

We also looked at the breathing zone data for the remediation period. In a nutshell, there's a graph, well, it's actually presented in a Table. In the White Paper and my presentation it's a graph so if you don't see it now you can see it next week when I present it to the Board.

The same, we used the maximum average, actually I used the maximum breathing zone per quarter and during the remediation period that was reported for individual workers and then I compared it to the MPC hour limit of 520, and I showed that none of the workers that were monitored by breathing zone approached this limit.

For the hot lab elevated data, we had quarters one to three in 1993 had elevated quarterly results in three locations. The service gallery, which was the staging area behind the hot cells and the basement, which is not generally occupied except when work is done. The worker breathing zone data remained below the regulation level and we also reviewed workers' whole body count data and some had small readings of cesium-137.

Again, when we looked at this, you know, if we had any workers that may have had potential intakes from this air data and the hot lab, we reviewed workers' whole body count data and we also reviewed workers' bioassay data because they had in the third quarter of '93, they had the new bioassay contractor on line so any kind of intake would have been picked

up by these elevated results.

Now I'd like to add that we're not quite sure if these results are real. They're extremely high and they're only reported in those two quarters. We did some research into what they did during this time and yes, some of the D&D work could have produced some airborne contamination.

However, this was quite a high reading so we're not even sure if those are spurious results, if there's some kind of interference with the detectors, if these are faulty. However we would assume that if they were faulty they might not report them so we're not quite sure what's going on with this. This is kind of an open-ended question here, because we would have to go and find any kind of raw data if that is decided that it's necessary.

We've come to the conclusion that general air and breathing zone data are available, but that we can, even though that we can reconstruct doses based on either available whole body count or bioassay data that was coming on after, right after these several quarters of elevated data.

So in conclusion for the general air and breathing zone data, they are available but some quarters, some facilities are not currently available. Some quarter reports are not available or don't exist. Raw data log books are potentially available. We have not looked for them yet. It's not clear how easily they could be collected.

The hot lab air data is the most complete data set and it's believed to be bounding. Some elevated samples that are unusually high but generally elevated samples would be in line with disruptive operations during D&D. Despite these type of operations, there is no significant worker intakes

observed and NIOSH believes that the available information is sufficient to band doses from D&D operations during the CEP period.

That's my summary of the air data for the CEP period.

Mr. Barton: Okay. This is Bob. I guess just to sort of tee this off since it's been on a while, I think we really discussed this about a year ago. The purpose of this air sampling review exercise, and please correct me if I'm mistaken, but I believe the intention at least when we met last was that you have this period where the bioassay contractor is suspect so you can't trust the bioassay data for this couple year period in the early '90s.

I think the intention was, at least back then, was that what we would do is we would take the bioassay data and the derived intakes from the operational period and extend them as essentially coworker intakes through this period into remediation. Am I correct so far?

Dr. Hughes: Yeah, I think that's true.

Mr. Barton: Okay. So, then the question was well, can we sort of build this weight of evidence that based on the air sampling data that we do have, which we have no reason to believe is necessarily suspect, can we make a comparison between what the radiological conditions were during the operations period which we're going to use as coworker data, can we make a comparison of sort of the exposure potential that we're seeing based on these air samples that we have.

And that was the original intent of this, was really to sort of bridge that gap to say listen, we can't trust the data in the early '90s because the bioassay contractor was not up to snuff, but can we confidently say that the conditions during the operational period

are going to bound what was experienced by workers who were performing these D&D activities?

So that was really the intent of this. So just to sort of set the stage of why we're going through this because as Lara said, you normally don't rely on air sampling data for dose reconstruction if you have bioassay data. In this case we have bioassay data prior to this period that we're going to apply to the early '90s to sort of cover up this two-year period where we can't trust the bioassay data and therefore we can't use it to develop any sort of unmonitored intakes.

So that's sort of the story. I will, I'll pass it off to Milton Gorden because as I said before he's sort of been taking the lead on looking at a lot of the underlying documentation in this. So Milton, if you're on the line I'll give it to you.

Mr. Gorden: I'm kind of relying on some of the stuff that you had done too.

Mr. Barton: I can keep going, that's no problem.

Mr. Gorden: It's probably going to be easiest, otherwise you'll just probably end up trying to explain more what I'll laugh to.

Mr. Barton: Okay. No problem. We did have some questions that we developed. I'll try to reference the report that's posted online so people can follow along.

One of them was, on page 7 it states, "A recent request for additional quarterly reports to DOE-EM Consolidated Business Center in Cincinnati where DOE records and SSFL operations were sent has not yielded additional quarterly review reports. It is not known at this time if additional reports or potentially raw data could be located."

So I guess our question, right off the bat, is is this request still ongoing to this records center, or have they exhausted their document holdings and there's simply nothing else there? And are there any other locations where there are Santa Susana documents held that could be of use?

Dr. Hughes: The request is not currently ongoing. It mainly consisted of me requesting some of their findings, and looking through, see if they had anything listed quarterly reports, and they said we haven't identified anything additional.

The quarterly reports were kind of driven by regulatory agency requirements so they may have not. They may have stopped writing them if they weren't required to do it. I think that's my understanding.

So if the quarterly reports aren't available, the raw data is, some of it is certainly available. I'm not sure what is available where. We know that a lot of the accords have been sent to this location in Cincinnati. I would think that most of the records that are of interest to us are available there.

Now when we do dose reconstruction, this is not at the level of where we necessarily collect, where we collect quarterly reports. We collect air sample summaries, we have not targeted detailed air sampling during this period.

I guess what I'm saying is we don't know what level of effort would be necessary. I feel somewhat confident that we would find something if we were looking for it but I have not done that. That would take quite a long time and a lot of resources.

There are other locations, we know there are some Iron Mountain locations that may have records, or that do have records, but I think those are more of a

general nature and not related to radiation protection records. I think it's mostly like human resource records and things like that.

Mr. Barton: Okay. I understand that. Moving on, on page 8, figure 1, it states, "Annual maximum averages," and I'm just looking for a little bit of clarification on what that actually represents. Would this be the highest average among the approximately 30 air samplers for this, or is it the average of the maximum readings of all the air samplers? I wasn't quite clear on that.

Dr. Hughes: I'm not, that's how it's reported and I do believe it's, you know, they take the maximum for each location for each quarter or, these are annual so they take the annual maximum for each year and average it over all the locations and that's what the number they report there. At least that's what I understand on that estimate.

Mr. Barton: Okay. So the average, and so this doesn't represent really the highest air sampler, it's the maximum ---

Dr. Hughes: No, it's an average microtron average. That's, it's in those annual summary reports so again, this may be available in much more detail, value pulled out from the summary reports.

Mr. Barton: Okay. That clarifies at least what we're looking at. And it looks like this, I mean, these are all just from the operational period though, right?

Dr. Hughes: Yes.

Mr. Barton: Okay. I notice it's for the beta samplings. Do we have similar comparisons, because again the whole point of this exercise was to compare what the air sampling was during the operational period where we're going to use the bioassay data to assign intakes

to this other period in the '90s.

Was there something done for alpha, and do we plan to compare --- I mean, I'm looking at figure 1, it stops in 1988 but it doesn't really show how that would compare to the period that we're trying to apply this bioassay to, and it's only for beta.

Dr. Hughes: Yeah, they did not report alpha for, this was for the hot lab so they did not report alpha for the hot lab. I think their main contamination concern was fission products. They went with the beta that they reported in these reports.

Mr. Barton: Okay. Moving along, page 9, it's indicated that breathing zone data, so these are the lapel samplers for the workers who were in there doing the D&D work, I guess they were compiled into an electronic database but we don't have that data?

Dr. Hughes: That's correct.

Mr. Barton: Have there been any attempts to get that database, or, you know, look at it?

Dr. Hughes: Yes, I have talked to an individual who was in charge of the health physics program and I was told that this database from the d-base, I think it was later converted into something else and it's available on a five inch floppy disk somewhere so no, it's not available to us.

Mr. Barton: Is there any plan at this time to go get that and ---

Dr. Hughes: I don't know where it is. I mean, we can certainly put, an avenue I would say is probably available to us is looking at log book entries if we needed the raw breathing zone data, that we would go for log books, health physics log books-type information that would be in the records.

Mr. Barton: When you say in the records, I guess that goes back to my original question. If we're looking at an individual claim from this period and presumably if they were doing this work that would be riskier as far as airborne contamination, are those records available to the dose reconstructor to be able to evaluate what the exposure to an individual was, at least, during this period?

Are those actually in the files? I mean, do we have, we don't have the complete database but is that, are those breathing zone results being supplied with an individual claimant's monitoring record?

Dr. Hughes: They occasionally are but it's not a given. I mean, they're not supplied in the same way that we receive external and bioassay data, so it might be in the records if it was filed in the records or if there's some kind of, let's say there was an incident report that was written in some cases.

However, we do have name lists, so these quarterly reports contain, they have usually in the form of an appendix, have a list of the workers that were involved in these D&D operations for the hot lab with their names and what their breathing zone information was for that quarter. We do have, we do believe we do have information for most of the workers involved in this D&D operation during this period of questionable bioassay data, that we do have that available, and that can be used for dose reconstruction if needed.

Mr. Barton: Okay. So essentially what you're saying is in the quarterly reports that we do have, it lists all of the workers who at least wore breathing zone ---

(Simultaneous speaking.)

Mr. Barton: And that's a complete list of all the workers involved?

Dr. Hughes: Well, you know, there will be a summary statement saying, you know, we had 11 workers wore breathing zone during this quarter and then they would have the names and then they would have, say, if Joe Smith had, I don't know, 25 entries, what they call entries, which is the number of times this worker geared up with this breathing zone apparatus and went in and did a certain amount of work.

We do have quite some detail available. It is, however, in the form of summary output so it's not more detailed than that, so it will be like a quarterly summary result for that given worker and it will report the number of entries that were made during that quarter.

Mr. Barton: Is there necessarily a position right now, I mean, being so confident that we have all the records? It's a completeness question, really. Do we have all the breathing zones, even if they're in the form of a quarterly summary, for listed workers, or is that still in question as to whether we actually have all these results of the workers doing the D&D operations?

Because as you said, at least my understanding is that they used those air samples to control exposures rather than, and the bioassay was a check. So, how confident are we that we have all those breathing zone samples to really know who was in there, who was doing what work and what the airborne levels were? That could be, I mean it's D&D work, so it's by its very nature it's a little off-normal, it's not routine stuff, and so you could have these localized events.

I'm not saying there were or were not, but how confident are we that we had access to all that data to be able to confidently say, or we're applying the bioassay data from operations that were really bound

in the exposures to these workers in there doing D&D work?

Dr. Hughes: We do have the breathing zone for the workers at the hot lab for this CEP period. We also have, keep in mind we also have whole body cam data for workers in the hot lab, so we would see exposures to, like, cesium. They actually did detect some of that during this period.

So for the hot lab, yes we do, we do have a breathing zone, which I assume it's a comprehensive list and they're available by name. We assume that the hot lab was probably the bounding operation here, because they really were doing some higher level work when they were taking out the drain lines from some of the hot cells in the basement, so yeah, we do have that available.

Am I confident? Well, I'm as confident, I mean, you could look at the records and where they list the workers by name, and it's fairly detailed information available. That being said, we don't have the raw data available at this point, and anything like in the form of log books or anything. We have not looked for this type information.

Mr. Gorden: I guess like follow-up then, excuse me, because that is in your opinion, do you think it's worthwhile, do you think what you've uncovered so far is probably going to be sufficient in doing, supporting the dose reconstruction?

Dr. Hughes: From the need-to-file program, I would say yes, it's sufficient to assess intakes for workers during this period, yes.

Mr. Barton: I'm looking at Table 1, it's on page 10 of the White Paper, and I guess it's the second quarter from 1992. It's giving alpha results significantly higher, at least by a factor of two, than all other

entries for alpha air sampling. Do we have any idea of what was going on there? These are also, I guess, maximum averages?

Dr. Hughes: I'm sorry, which one was it again?

Mr. Barton: I'm looking at Table 1, in the second quarter of 1992, you have an alpha result that's on the order of minus 13. I notice that's a factor of two higher than every other reported result for this table. Do we have any idea what was happening then? It just caught my eye.

Dr. Hughes: Right. No, I don't. I mean, every quarterly report has a summary available of what the specific work was but it doesn't necessarily specify this is why these values were elevated. Keep in mind this was below the maximum permittable concentration for alpha, so they did not really discuss. Actually, they didn't discuss the incidences where they were above, so no, we don't know specifically what was going on.

Mr. Barton: And it says maximum reported value so that would be, I mean, I think these things were going on essentially a weekly basis, you'd have a sampling for seven days so this would be the maximum ---

Dr. Hughes: These are maximum reported value for the quarter. I just, they're, I went through all these quarterly reports and they report the different locations and I pulled out whatever, what was the highest location that was reported and in this case, the hot lab, so between the 28 different locations reported I would report the highest.

Mr. Barton: I guess my question is does that represent the average over the entire quarter?

Dr. Hughes: It represents a quarterly average, yes.

Mr. Barton: Okay. This kind of leads me just to my last question here, it's on Table 2. You discuss this sort of in the presentation. These values are huge.

Dr. Hughes: Yeah. I know.

Mr. Barton: We're talking about 10 to 12 orders of magnitude higher than the DAC.

Dr. Hughes: Yes, right, they're very large and we don't know what to make out of it so that's why we went, you know, look at worker records to see did they have any kind of significant intake or anything, or are these even real, you know? We'd like to not say oh, they're not real, because we tend not to do that.

Mr. Barton: Of course.

Dr. Hughes: But they seem very high. They're very high so we don't quite know what to do with them. Short of looking for log books and trying to figure out is this real, what's this, what's going on here? But then again, we were like well, you know, to what extent do we want to pursue this, I guess, is the question.

Mr. Barton: It's surprising that if these were being reported and even in a quarterly summary that they wouldn't ---

Dr. Hughes: Right, and they don't discuss it, it's not being discussed at all so it's kind of strange.

Mr. Barton: And to sort of follow up without getting into any obviously specifics that would skirt the Privacy Act line, you went and evaluated a couple of workers?

Dr. Hughes: Yes, I looked at a small number of workers whose names were listed.

Mr. Barton: So these would have been in the appendix that showed they were wearing lapel samplers during those quarters.

Dr. Hughes: Yes, and not necessarily claimants but we received the worker dosimetry scans from Boeing years ago so we can by name matching, we can look at these workers' files and see what is in their health from a bioassay standpoint, from a whole body count standpoint, if there are incident reports in there, anything like that.

Mr. Barton: I mean, these Table 2 values are so high. Do we have any comparisons to say that, I mean, it's simply a unit that got ---

Dr. Hughes: I don't know. It might be a short circuit and, but then why would they include it, you know? I'm not sure.

Mr. Barton: Okay. That's a little disturbing, just seeing how high they are. Like I said, it's 12 times the MPC.

Dr. Hughes: I did talk to the person that was in charge at the time or one of the health physics managers that was in charge of this facility at the time and he basically looked at the records like, well, I don't think those can possibly be real. He recalls seeing elevated general air data, but not to this magnitude. It's not uncommon to see something, but not this much, and so he didn't have an answer for me either and so we kind of don't know what to do with it at this point.

Mr. Barton: Well, that's all the questions I had to sort of clarify NIOSH's position. I don't have anything more. Milton, do you have anything you want to ask or obviously the Work Group probably has questions as well.

Mr. Gorden: No, that's fine. Work group can go ahead.

Chair Schofield: Lara, I got a question for you, this is Phil. Do you have the criteria for incident reports? I mean, like does alpha count has to be a certain level, or do you know what these levels are?

Dr. Hughes: I do not know, no.

Chair Schofield: Okay, thanks.

Member Beach: Lara, this is Josie. You mentioned a couple of different times during your presentation about getting more log books or reviewing more log books. What kind of a possibility is that? And you talked about that floppy, that someone mentioned that those records were put on the floppy. Is there any follow-up to trying to figure out where that went or it just is in somebody's file and it's not obtainable?

Dr. Hughes: Yeah, so I talked to the person who was in charge of the health physics manager at the time, and I asked him about this database, and he basically said that this was converted from database format, whatever d-base, into something else. He basically said it was on storage files that were not, that are out of date now and he does not think it's available but at the same time, we haven't actually looked for it.

And the other though I can report, and that's for log books. You know, any of the summary data that is reported in the quarterly reports, it would be somewhere else. Especially with these elevator reports, the thinking goes that there would be some log book entries of some sort. Because somebody pulled these samples off and wrote a number down that was really extraordinarily high. They must have had something to say with regard to that although it is not reported in the quarterly reports.

Now, what kind of time and effort would be needed to find this type of information, I don't know if it's needed for the purpose of this program or not. I'm not quite sure.

Chair Schofield: Other Work Group Members?

Member Field: This is Bill. I just have a question about your conclusions or data conclusions. Your third bullet, you say it is not clear if this data is available and how easily it could be collected. When you're talking about this data, are you talking about the log books? Because it's a different bullet, or the quarterly information for air monitoring?

Dr. Hughes: For both. I mean, there's some, you know, we don't have all quarterly reports and I'm not sure if those were written, because they may have followed some kind of regulatory requirement. And again, the same with the raw data. For any kind of quarterly report there is raw data somewhere, or used to be. So yeah, it's not clear.

I haven't actually seen it, I haven't seen a finding aid that says, you know, HP logbooks for this time period, so it's not quite clear to me if this data is available. I would think that it is, but until I see it I can't speak to it. And also, how easily it could be collected. I mean, the collection part may not be the hard part but how easily it is to decipher and to catalog and to uncode and all that sort of thing.

Member Field: Okay. It may be helpful just to state what you meant by this in the bullet. And in the first bullet point, instead of the data are available, but they're not currently available, that makes it sound like they may be available in the future.

Dr. Hughes: It's the same thing. This is regarding the Table 1 of the White Paper, you know, we have

quarterly, we have some quarterly reports. We have quarterly reports available for the SNAP facility, for the radioactive material disposal facility, and for the hot lab, but not for all the quarters that we were focusing on so I guess my statement is, well, we do have some but we don't have all quarters and we don't have all facilities.

They're not currently available because there may or not be some more quarterly reports out there, but we just haven't located them. I did a cursory search at the local, Cincinnati local records facility where most of the records were sent, and they did a keyword search for me and they have not located any additional one. That's not to say that there aren't somewhere, but we may just have to search in a different manner.

Member Field: And this isn't, you're going to be putting a lot of effort into, in the near future locating, correct?

Dr. Hughes: I'm sorry?

Member Field: And this isn't something you're going to be putting a lot of effort into to try to locate.

Dr. Hughes: Well, if it's the desire of the Board or the Work Group that we need to clarify or shed more light on the nature of the air data or the exposure scenarios, then we will do this but we feel like for the current dose reconstruction program we don't feel like we need to do a tremendous additional effort to be able to do dose reconstruction, I guess is what I'm trying to say.

Member Field: I understand. I was just trying to interpret it by not currently available as they may be available next ---

Dr. Hughes: We don't have them, we don't have

them in our database, I guess.

Member Field: I understand. That helps clarify it. Thank you.

MR. MARCH: But they are available somewhere, you think?

Dr. Hughes: They may be. It's quite possible that we could find, well, I'm not the one to speak to the quarterly reports, I really don't know. The raw data, some of it is probably available somewhere, yes. We have not looked for this type. We don't usually go to that level of searching, or we haven't for this facility.

MR. MARCH: Okay.

Mr. Barton: So I guess just to summarize, what we're really saying here is based on the conclusions of this White Paper on what air sampling data we do have that it's NIOSH's position of intention that applying the operational coworker model to this period is sufficient and the available data that we do have shows a radiological environment that is bounded, essentially, by that operational data.

So we can use the operational bioassay or if we're not using the air samples to reconstruct dose, we're going to assign doses based on the coworker model in place currently. Is that correct?

Dr. Hughes: The coworker model would be used, yes, for an unmonitored worker. For the monitored workers we would use whatever is available.

Mr. Barton: Well, during this period, this is ---

(Simultaneous speaking.)

Dr. Hughes: Well, if you have this, if you have a worker who was working in the hot lab, if we have

breathing zone available it probably would be the, they would probably do a check and see which one was more bounding.

Mr. Barton: I see. Okay. I don't have any other questions.

Chair Schofield: Anybody else have any questions?

Ms. Blaze: I do. This is D'Lanie, SEC petitioner.

Chair Schofield: Go ahead.

Petitioner Questions/Comments

Ms. Blaze: Thank you. SEC-235 was initially based on an inability to identify work locations or effectively rule out Area IV employment. We've established that Boeing's record responses are unreliable and incomplete.

In April of 2018, we found that Boeing has omitted radiation and bioassay data for a hot lab employee who was also employed at the DeSoto facility. His record indicated a notation from a contractor that whole body counts were never reported for workers at Santa Susana and the DeSoto facility, so my question is has the Work Group and SC&A and NIOSH reviewed the clean studies comparison that I submitted for this employee? It's dated April 30, 2018.

We found that Boeing had also redacted all of that employee's incident reports that were supplied to DOE, which were easily retrieved from the Boeing incident report database, and that they had omitted pages where that worker was shown in diagrams to be involved in extraordinary events. This really calls into question the integrity of their records responses with respect to radiation data, and establishing your processing. Have you guys received and reviewed the

case study?

Dr. Hughes: This is Lara. I have it and I have reviewed it and we have actually, DOE is actually working on this with Boeing at the moment, so there's actually a contingent going out and trying to figure out what the issue is with Boeing and why, you know, there was certainly a disconnect between what you sent in for this worker and what I think Boeing provided to DOE or DOL, because this is not a claim that is with NIOSH.

I was instructed to look at it, and what I did is I pulled the worker dosimetry files that we have from this Boeing data dump that we received in 2014, I believe, and we do have a lot more than what Boeing has supplied at this time. So I think what DOE's trying to sort out what the issue is.

This may have something to do with the Boeing responses. I think they're coming from headquarters now instead of coming from the site directly and the people that are working there may or may not know how to search properly so I think they're trying to resolve it, and I'm trying to help them if they, as much as I can based on what we have so hopefully they will get this resolved.

Ms. Blaze: I don't know that it's a question of knowing how to search properly when they turn in incident reports that have been actively redacted, with pages missing, but obviously we're awaiting resolution of that issue. It's just calling into question the ability for claimants who are eligible for existing SEC to even establish that they were employed at the site because of contractor interference. That by itself is the basis for an SEC class. That's all from the summary until I see the White Papers.

Dr. Hughes: Right. Again, this is Lara. I can't speak

to, I mean the SEC class is based on certain guidelines that we have to follow, so we'd like to brush this off as is this an issue for DOE and this is an issue for DOL to establish employment at the site, but we'd certainly try to help with whatever resources we have if the question is posed to us.

Ms. Blaze: Thank you. The study, and is the Work Group, do I need to send that out? Again, could someone just advise me on that?

Mr. Katz: D'Lanie, can you just repeat what you asked just now?

Ms. Blaze: Sure. Has SC&A and the Work Group received a copy of the case study on those missing records? If you guys will let me know. I can send it out again if I need to.

Mr. Barton: This is Bob at SC&A. To my knowledge, it certainly hasn't come across my desk, and so I don't think we've necessarily been I guess formally tasked with looking at it, and I don't think we have done anything on it. It sounds like from what Lara said that the matter is being pursued by the agencies involved, which is really DOE and DOL, I guess, at this point. We can look at it if that's what the Work Group wants us to do. That's all I can really say. And I, to my knowledge SC&A has not done any work specific to the issue you're talking about, which is obviously important and needs to be run to ground.

Ms. Blaze: I would just respectfully submit to the advisory Board, there's documentation suggesting that whole body counts were not reported for these employees, so if it pleases the Work Group I'll send that case study out again, if they think it's relevant.

Mr. Katz: D'Lanie, you don't need to send it again, because I think DCAS can share that again with SC&A but there's not going to be a tasking at this point.

Ms. Blaze: Okay.

Member Beach: And I see, and I have it right in front of me, D'Lanie. Is it April 30, 2018?

Mr. Katz: Yes.

Member Beach: Okay. Thank you.

Ms. Blaze: Thank you.

Mr. Katz: So, path forward, I think, is where we're at, Phil, right?

Chair Schofield: Yes.

ABRWH December meeting plans/other follow-up

Mr. Katz: So the immediate issue with path forward, to tell whoever this is what we want to do at the Board meeting. This is clearly not ready yet for any kind of Board action, because we haven't even had a chance, SC&A hasn't had a chance to respond formally and review it formally.

So it's more sort of sorting out presentations. We have Lara's presentations, and I don't think they would take much adaption for the full Board. My thinking is that there's not any other presentations to be made at this point, because SC&A is not really ready to make a presentation on this, they've just got these clarifying questions so I think for Lara to present and then the Work Group Members, of course, can pipe up with any observations or questions again that they want to raise at the Board meeting, and of course the petitioner will have an opportunity to comment at the Board meeting, but I'm thinking there's not more to be done. I'm open to whatever the Work Group thinks.

Chair Schofield: I have to agree with you, I don't

think we're ready for a possible vote on this. We still have to wait for SC&A's paper to come out.

Mr. Katz: Right. So it may be that we can, we need to leave enough time for D'Lanie to comment as soon as she wants to at the Board meeting, but it may be that we don't the whole hour and a half for this. Lara, how much time do you think you need for your presentation?

Dr. Hughes: It's about the same, so what was it, 20 minutes. It's the exact same presentation because I have to submit it way in advance so it's exactly, the title slide's different, so yeah.

Mr. Katz: Yeah, I wasn't really tracking how much time you took and that's why ---

(Simultaneous speaking.)

Dr. Hughes: Well, I think, you know, I should get through it in at the most 20 minutes.

Mr. Katz: 20, 25 minutes.

Dr. Hughes: Yeah.

Mr. Katz: Okay, okay, and then if D'Lanie, do you think you need 15 minutes? How much time do you think you might need?

Ms. Blaze: If we can allot for about 20 minutes.

Mr. Katz: Okay. And then time for questions. So my thought is then this session could really be about an hour. For this portion of the session, of course, 20, 40 minutes, because we also have DeSoto to talk through as well.

Ms. Blaze: I'm sorry, Ted, I just want to clarify. Are we going to be discussing both of the petitions, 235 and 246?

Mr. Katz: Sure. Sure. We just haven't gotten to that for this Work Group yet. But yeah, they'll both be on the plate for discussion at the Board level, yeah. All right, so we can go on from here now to the next portion.

Mr. Barton: Okay. Let me just quick get my presentation up here on the Skype for everybody. I forget how you present it as a slide presentation. Okay.

To those of you that have the Skype up, can you see the presentation slides?

Chair Schofield: Not yet.

Mr. Barton: Okay.

Mr. Katz: Yes, not yet, Bob.

Mr. Barton: Okay, sorry about this. Let me see -- try it again.

Mr. Katz: It's loading now, Bob. Yes, there it is. You just need to expand it.

Mr. Barton: Okay, how does that look to everybody?

Mr. Katz: Small.

Mr. Barton: Small.

Mr. Katz: You need to make it a little bigger.

Mr. Barton: It's showing it as a slide show on my screen.

Mr. Katz: Yes.

Mr. Barton: Let me try that again. Did that go full screen?

Mr. Katz: I don't know how other people -- it's

definitely legible. So you can carry on.

De Soto Avenue SEC petition

SC&A review of DCAS De Soto Evaluation Report

Mr. Barton: Okay, very good. Very good.

Okay, we're going to be talking about SEC-246 now. And that was submitted on December 13th of 2017. The proposed definition in the petition was all workers who worked at the De Soto Avenue Facility in Los Angeles County, California during the period from January 1, 1965 through December 31, 1995.

The rationale provided in the original submission read as follows: NIOSH has determined it cannot reconstruct radiation dose for americium, thorium, or associated progeny at SSFL Area IV, 1965-1988 -- it says 988, unfortunately, but I'll fix that. Based on shared contractor and operational history, shared data limitations between SSFL Area IV/De Soto Facility, and the established presence of americium, thorium, and associated progeny at De Soto Facility until at least 1995, the following petition is submitted.

So just to give a little more background, the SEC petition qualified on March 1, 2018. The proposed class essentially will remain the same, just the standard language about DOE and its subcontractors was added in but essentially it remained unchanged.

In July of this year, NIOSH released the SEC Petition Evaluation Report and that was presented in August of this year at Meeting 124 of the Advisory Board, which was in Providence, Rhode Island.

After discussions at that Board meeting, SC&A was tasked with reviewing the main conclusions of the ER, Evaluation Report. So that's where we are today.

Now, the two central conclusions of the Evaluation Report and, again, I'll just -- I'll read these into the record. Again, these are based on americium and thorium potential.

For americium, neither the documents available to NIOSH nor interviews with former workers revealed any history of fabrication of americium sources, or work with uncontained americium at the De Soto Avenue Facility. Contrasting previous NIOSH evaluations of radiological work at Area IV of SSFL, NIOSH has found no indication that De Soto had sources of americium associated with work processes.

Now the conclusion for americium in the NIOSH ER, that was released in July.

And for thorium, NIOSH has identified detailed documentation of thorium work episodes in 1970 and 1979, providing source term, operational procedures, radiological protection protocols, names of individual operators, and dates of work. NIOSH has concluded that the thorium-grinding operations in 1979 represent the bounding thorium internal exposures at the De Soto Avenue Facility during the operational period, which is January 1, 1965 through December 31, 1995.

As presented in Section 7.2.3.1, NIOSH had sufficient personnel bioassay data, including pre-work and post-work urinalysis, and job performance data to allow it to develop a bounding dose estimate for workers with potential thorium exposures during the period from January 1965 through the end of 1995.

So our review approach at SC&A was, obviously, we're going to start with what available documentation is in the Site Research Database, as available to both NIOSH, SC&A, and the Advisory

Board, as well as the documents that were supplied by CORE Advocacy for Nuclear and Aerospace Workers.

We also went through and found what documented interviews there were with former workers at the De Soto facility and there was also a signed affidavit supplied by a former health physicist who worked at De Soto.

The third thing we did is we went and we looked at a very substantial portion of the claimant population. We focused in on job classifications that would likely at least have a potential for involvement in these radiological operations.

And we specifically looked at what's known as a CATI report, which is a Computer-Aided Telephone Interview, in which to see if there were statements made about what type of work was being done, what exposure there was, especially to americium and thorium, and really anything else that would be of interest going on at De Soto during this time.

Also for several of the claims often led by what was contained in the CATI, we would go into the Department of Labor case files, which are essentially the initial submissions that often contain other information and statements made by the claimants that might be relevant to the potential for exposure, particularly to americium and thorium.

As far as the available documentation we have, really there are four really important primary document types that we focused on. That's not to say these are the only things we looked at but if we were going to find evidence of what the exposure situation was at De Soto during this time, it was really the health physics log books, which these would be hand-written logs, what the HPs were doing out at the site

on a daily basis.

There is also something called a tagged area entry permit. These are essentially radiation work permits. If there was something that was going to be done that required potential for exposure, there was a standard form that would be filled out that would specify what types of radiological protection were going to be required, what types of monitoring, whether it be personnel monitoring, whether a bioassay was going to be needed, that sort of thing. So that would give us an indication what type of work might have gone on with thorium materials or americium.

We also have the routine contamination surveys. These are pretty standard across all these sites, where an HP would enter a specific room, would take swipe samples of that area and then go and count them for activity.

Now these are usually only provide gross alpha and gross beta but there is also a comment section where they can indicate whether -- what was going on in that room, if they found some contamination, what sort of operations were. So that is just another clue.

And the fourth item of great importance, the area air sampling results and also the personal air sampling results, which we just spent a lot of time this morning talking about those, breathing zone, and lapel air samplers which, again, oftentimes will include what the material was, what they were doing, what the operation was.

So these are really the primary sources that would really characterize what was going on radiologically at De Soto.

Now our first finding was that when we were looking through all these different types of documents that

really there's a sampling of them throughout the period. And we'll see in the next couple of slides what I mean here.

So what we're looking at, this first one is health physics logbooks. And as you can see, it's probably hard to see the actual numbers in here but what we have here is a chart -- a bar chart that shows from 1965 to 1995 and what percentage of the months in each year in which we have at least some health physics logbooks from De Soto. Now, this doesn't say exactly if an entire month is covered or whether it covers all relevant buildings. In this case, we're mainly talking about Building 1, where they did the fuel fabrication, and Building 4, which was the radiological laboratories.

So as you can see, there is a very large gap if you'll notice, from 1968 to about 1980 in which we couldn't really find any of those health physics logbooks to really know what was going on at the site.

This next one is, again, these essentially radiation work permits. They call them tagged area entry permits. And again, some years you have the entry permits for all months. Now again, you can't really know if that represents all of the tagged area entry permits in the year but at least we know that temporally we have some for each of the months, at least in the 1969-1970 and then in 1980 and 1981.

But also, again, during the full scope of this evaluated period for SEC-246, for a lot of years we could not find any of them.

Routine contamination survey reports, those were the third source that I mentioned. Again, we have gaps. I mean there were temporal gaps. This is not necessarily surprising as you go and -- any sort of these data capture trips, oftentimes, you only get a

sampling of all the different things going on but you don't necessarily have the wherewithal to capture every single document.

So there are these temporal gaps, which does add some uncertainty as to being able to make conclusions about all of the activities that might have happened at De Soto.

And this last one is the area air sampling. Note that this does not include personal lapel samplers. I was working towards trying to get that data compiled in time for this meeting but the clock was ticking and I just ran out of time. But these are going to be your general area air sampling results which, again, will oftentimes include notes about what was going on in a particular location where an air sample was taken, even if the results are simply given in gross alpha or gross beta.

So specific to americium, essentially we see four potential sources where this -- you could have exposure to americium specific to De Soto. The first one and probably one of the more important ones would be any spent nuclear fuel that had been decladded and handled at De Soto. We know that this operation did occur at Area IV. So the question becomes because of the shared radiological health program and the shared goals of De Soto and Area IV, did they receive decladded spent fuel or do the decladding themselves, in which case you would be expected to encounter transuranic material, which would include americium.

They also had a license to fabricate sealed americium sources. So they did receive americium material and, under their license, they had the ability to basically expose that material and create sources for other offsite parties that were interested and wanted that sort of material. And I believe that they had a license

for up to I think it was 10 millicuries of americium at any given time for that program.

So that's the second real source of potential exposure.

There is also this program known as the Transuranic Management by Pyropartitioning-Separation or the TRUMP-S program. It is basically a program to try to figure out how to dispose of spent fuel in the transuranics that are contained in there. So that material could have included americium that was not sealed, which obviously if you have an unsealed source of americium, you might have an exposure potential.

And the last one which was interesting was smoke detectors that were at the De Soto facility, which actually used americium for at least a certain period of time. We're going to talk about that.

So the first one, the first source of exposure was the decladded spent fuel. Today, we have not identified evidence of actual or direct evidence of decladding activities of any spent nuclear fuel occurring specifically at the De Soto site or, as it's pretty well documented, as occurring at Area IV. We just have not found the evidence to date.

We did identify examples of the spent fuel arriving and, at the very least, being stored at the De Soto site. But again, any documentation indicating the handling or processing of the actual decladded fuel, which is where the transuranic material would have been, again, to date we have not identified that sort of evidence.

We did find one example where one of those area surveys an HP found a contaminated tray and this was in Building 4, which is the radiological laboratory. Essentially, they found a contaminated tray that had

been used to clean sodium from decladded fuel elements. It doesn't go into much more detail than that.

We're not sure if the fuel has been decladded actually at De Soto or if that occurred possibly at Area IV. But obviously, we assume that the fuel element was actually irradiated. That's not necessarily indicated but you would assume that if they were going to take apart the cladding on a fuel element, that they probably spent some time in a reactor.

So that incident was the subject of SC&A Finding 2. Again, it was a tray that was contaminated and the logbook entry, or actually it was, I believe it was a survey report, indicated that that tray had been used to clean off decladded fuel. So that's about the extent of what we found so far related to that first exposure source.

Now we talked about the fact that De Soto had in its license to be able to use unencapsulated americium for the purpose of fabricating other sources to be shipped offsite. In fact, there was even a notice of violation in 1994 that the required six-month leak check -- essentially they had americium sources that were encapsulated -- and by their license requirements, every six months if they were in use, they had to be leak checked to make sure that the material was being contained and not lose contamination that could potentially be ingested or inhaled.

But the notice of violation, honestly, the six-month violation was -- they were late by between one and eight days. So, it wasn't necessarily that serious. Obviously, they were in violation of it.

There was actually a repeat violation. Again, they had been noted that in 1991, the same problem that they

weren't specifically on that six-month schedule. But at the same time, the notice of violations did not actually indicate any of the sources leaked. So they were -- they violated their license by not doing it every six months but, again, we don't have evidence that those sources were compromised and could have resulted in any internal exposures at De Soto.

The TRUMP-S program, we found some documentation from 1989 and I kind of alluded to this before, where some TRUMP-S materials arrived at De Soto, which was the headquarters, essentially, for the entire site and it was lost.

Basically what happened is the material arrived at the loading dock. The workers there put it in the standard radiological source locker to keep it secure. What failed was the paperwork associated with it in that health and safety and the radiation control people were not notified that this stuff had arrived. And so they didn't go and inspect it and swipe it in the timely manner required by NRC.

They eventually did find it and the packaging of the material was intact. There was no external contamination, so no indication that that material posed an internal source of exposure.

And also the investigation documents actually indicated it was just depleted uranium and some plutonium. Americium is not specifically mentioned with this incident.

And beyond that, we did not identify any evidence or documentation of these TRUMP-S materials actually ever being used at De Soto. Our current understanding is the material arrived and it was eventually transferred over to Area IV. And then they didn't actually do any work with it and then, eventually, it was shipped offsite to another location

where they actually did that research.

And lastly, we have the smoke detectors. Based on what we've seen in the documents, they didn't actually use those until about April 1985 but the worry is that if you have americium in a smoke detector, if that source becomes exposed, then it could become an internal exposure source.

They did the preventative maintenance on these smoke detectors right where they were. So that work was definitely being done at De Soto. But if the smoke detector was malfunctioning and actually had to be repaired, it was sent over to the electrical shop at Area IV to have the repairs done.

So essentially what we'll be talking about with preventative maintenance is going in with rags and cleaning solutions and just cleaning them up some.

In the late '80s, they actually had a radiological study of this specific potential pathway, that is the workers going out and doing the preventative maintenance on these americium smoke detectors, what is their actual exposure potential. And what was indicated is that there is little to no potential really from that source. They measured all the cleaning materials that were used and they were below the NRC levels for release to uncontrolled areas. And the workers who were actually involved, directly involved in that maintenance activity submitted bioassays afterwards and there was no potential activity in those samples.

Continuing on with americium, we did find one document of a survey that occurred in the late '80s in the Mass Spectrometry Lab, which is in Building 4 at De Soto. We're going to take a quick look at that in the next couple slides but, essentially, it looks like the document was edited internally by site personnel because what you see is you have these red

strikethrough marks through certain sentences, sentence additions, edits. You'll see what I mean in a second.

But what the document does indicate is that when they went to go survey these industrial waste drains in Building 4, they did find americium in the drain. So the question is what was going on that put that material there and does that represent an activity that could be source of exposure.

The edit notes that there was no documented release of americium or plutonium but also it also sort of indicates that they couldn't explain it at the time they found it, which again was in the late '80s as to how it got there. So we're going to take a look at that right now.

And you can see what I mean about the editing, which clearly went on with this. And what we're really looking at, and I'm going to blow it up on the next slide, is down towards the bottom right corner you see the presence of americium-241 within a drain sample and there is sort of -- it's sort of difficult to follow.

What I will say is that since we put this presentation together you know I kept digging and did find the actual source document which talks about this and it's exactly what it says. The americium that was found in the drain was unexplained but that no documented release of plutonium or americium occurred.

And this is kind of blowing up that section. You can see here it looks like 48 picocurie but I think based on the source document that I identified it was actually 400 picocurie that was in about 49 grams of a sample of -- I don't remember if they referred it to slag or what it was but they say soil here.

But again, when they went to go survey some of the drains in Building 4, they found americium in the drain. So that begs the question how did it get there and what operation could have gone on to put it there. And does that represent a source of exposure that needs to be accounted for?

Moving on to thorium, the NIOSH SEC evaluation had identified three distinct thorium operations, which are discussed extensively in that report.

The first one was some thorium fuel simulant discs which occurred in June 1970. Another one included post-test analysis of some thorium that had undergone destructive testing. I believe that occurred at Sandia and they got the material back and then they essentially analyzed it. And the third one was the grinding of over 500 thorium plates, which occurred in late -- or 1979.

That 1979 grinding operation actually included bioassay sampling directly for the workers that were involved in it. And NIOSH used that, analyzed that to essentially come up with a thorium intake rate, which it states in the ER could be used to bound thorium exposures to workers in general at De Soto, not just the ones that are named with this operation.

Some other activities that we identified with thorium, there appeared to be some sort of source program going on in what we understand to be Buildings 4 and 5, which occurred in 1969. We have some personal air sampling results from thorium operations, including in a room in Building 1. That was also in 1969.

We have one of those tagged area entry permits that talks about inspecting dimensionally, I believe it was, of thorium fuel simulant discs that occurred in March 1970.

We identified personal air sampling with a thorium cutting operation. That was in 1971. So again, these area activities that we identified in those sort of four document types, the HP logbooks, the air sampling reports, entry permits, that sort of thing.

And there were several references, including many provided by CORE Advocacy that talk about the SRE fuel and other materials associated with it that arrived at De Soto. But unfortunately, our review of that material didn't indicate what the future use was Plan B, other than possibly storage, or any information about what they were going to do with it other than storage.

One confounding thing, and I can probably work with Lara offline about this, is that the personal air sampling results that we have for a lot of these activities are in the units of microcurie hour per cubic centimeter. And our understanding, at least at this time, and again I can work like I said with Lara offline, you need to know how long the operation happened to actually convert that into a meaningful air concentration for comparison. That would important to be able to establish to really know that the intakes derived from that thorium grinding operation in 1979 are going to be bounding for any of these additional activities that we identified.

Moving on to the interviews, in the Evaluation Report there's actually just two individuals that were interviewed after the submission of SEC-246. One of them didn't work at De Soto until the 1990s and so they even admit that their knowledge on the subject is based on retrospective documentation, things exactly like the NIOSH TBDs and Evaluation Report. The other one didn't necessarily work in radiological areas. In fact, they say they didn't but they were in a position where they would have likely had knowledge about what was going on but they didn't

begin work until the late 1970s.

So again, those were the two documented interviews in the SEC Evaluation Report.

There were seven additional reports that were in the SRDB that had been performed prior to the evaluation of this petition and were involved in work at De Soto but three of them didn't appear to actually work during the period of interest, so didn't really have relevant information and the remaining didn't specifically discuss americium or thorium. Often, they were more focused on work that occurred at Area IV, not necessarily what was going on De Soto and not necessarily what was specific to americium or thorium.

There are some more interviews, though, that were performed by DOE and EPA sometimes in conjunction. These occurred in 2010 and 2011. Again, they were mainly focused on former Santa Susana Field Lab workers, so Area IV, but that's going to include a significant population of those who were at De Soto. The document we looked at had a total of 121 interview summaries that had been cleared for release; 41 of those reported work at the De Soto site; and 13 had information that could be relevant to SEC-246. Now when I say information relevant, what I really mean is based on the interview, these people were in a position to know about the radiological operations during this period we're talking about. But none of these actually mentioned specifically work with americium or thorium. But again, I guess down the line some of these workers might be able to be contacted if it's warranted to see what they know specifically about the potential exposure at De Soto.

So again, this was really trying to go through and see who is out there and what they have to say about the

exposure potential there. And this is what we came up with. So I mean these are obviously interview candidates if we decide to go that route. Now, I don't know necessarily their availability at this time. In fact, I don't even know their names. They were assigned an arbitrary number in the document that I'm talking about here but that might be something that could be pursued again, if it is deemed necessary.

And the last thing we talked about was the claimant population. There was about 257 total claims that have covered employment at De Soto at the time we put this review together. So we looked at the Computer-Aided Telephone Interviews for these. For a sizeable portion, about 73 percent, and again that was based on the job titles and the likelihood that that job title would of potentially be involved in radiological operations, and we'll see what they have to say. Only a small fraction indicated, and again I can't give the actual numbers or we don't want to give the actual numbers for Privacy Act reasons, but it was a small fraction that indicated any exposure to thorium and/or americium. But again, at least six were conducted directly with an energy employee that could possibly be followed up with and talked to again to see what specifically they remember and what they're talking about. Because again, it's a generic sort of interview form and there's a checklist of contaminants where you say yes, I was exposed to this, no I was not, or I don't know. And oftentimes, at least in these cases, americium or thorium might have been checked but further information was not present at that time. So again, if it's deemed necessary, we might be able to talk to these individuals further.

And then petitioner-supplied documents. This was supplied by CORE Advocacy for Nuclear and Aerospace Workers. There were at least 20 primary

reference documents that were provided that are specific to De Soto and also a White Paper that had 59 individual items identified. And a lot of the documents were actually already contained in the SRDB but some of them, I believe, were new. And so we went through those.

There was also a signed affidavit from a former worker. Direct evidence in that affidavit did not indicate necessarily potential to americium that was unencapsulated, or decladded spent nuclear fuel, or actual fabrication operations in thorium. We also -- we did re-interview that worker earlier last month in November but the results have not been finalized on that interview. So we can't really report back on it because, obviously, the interviewee needs to see our summary of the interview and correct anything that is not correct or add anything that they maybe didn't state during that interview.

For the documents provided by the petitioner, SC&A went through and reviewed each one but, again, we didn't find the evidence necessarily of an internal exposure hazard to the americium. A lot of the documents indicate spent fuel possibly arriving at De Soto but did not directly indicate that that material was going to be processed, per se, at De Soto, other than possibly stored. We didn't find any evidence of the decladding of spent fuel elements, other than that one incident I mentioned earlier about the tray. And again, we're not sure where that decladding took place but we do know there was that contaminated tray that had been used on decladded fuel.

And we did not identify evidence of direct processing of the SRE fuel rods which contain thorium or other thorium activities necessarily in these additional documents which would not, to us, indicate a greater hazard than the plate-grinding operation in 1979, which NIOSH currently proposes for coworker

assignment.

So to summarize our findings, once again, we noted temporal gaps in the available primary documentation which is the health physics logbooks, tagged area entry permits, contamination smear surveys, and the general air sample reports. The disposition of any additional documentation we don't necessarily know at this time.

Like I just said, we found that logbook entry about a contaminated tray that had been used to clean decladded fuel. It was in the hood of -- well, I guess did I say the chem lab? I guess it was in the fuel fabrication area. So it was Building 1, not Building 4. And again, if it's decladded fuel, the usual assumption is that it was irradiated. And if it was irradiated, it could contain transuranic contaminants which would include americium and, again, it was just called decladded fuel but if it was fuel that had thorium as part of its makeup, then it could have also represented an exposure source to thorium, as well as the transuranic americium-241.

There is that 1997 document, which refers back to a 1988 document about finding the americium in the industrial waste drains and that was in the chemical -- or radiological laboratories. And again, we don't know where that americium came from. And like I said, since the issuance of I guess the preliminary report in this presentation, I was able to track down the 1988 survey and that's exactly what it says: we found americium-241 and we don't know where it came from.

And then Finding 4, again, only two individuals were interviewed about this specific petition after it was submitted. But as I noted, based on the DOE and EPA interviews, as well as the claimant population, if it's deemed necessary, there are potential interview

candidates out there that might have more information.

And that is the end of my presentation. Oh, no. One more slide here. I'll just read this into the record.

Although SC&A did not find evidence of operational processes involving unencapsulated americium at De Soto, at least one incident of material potentially contaminated with transuranic material associated with decladded fuel was identified. Furthermore, it appears that americium was detected in the Mass Spectrometry Lab drain samples in 1988 whose provenance is unknown.

SC&A has not identified direct evidence of thorium operations occurring at De Soto during the period under evaluation that would not be bounded by the calculated intake rates derived from the 1979 grinding operations that is being proposed for coworker application.

However, we noted significant temporal deficiencies in the available primary documentation of health physics activities at De Soto. Again, those are the logbooks, area surveys, entry permits, and air sampling.

And the available documented interviews directly associated with radiological conditions at De Soto under evaluation are currently -- clearly limited at the current time. Again, essentially just those two individuals who were interviewed directly about potential americium and thorium exposure at De Soto.

So the next slide is just a place holder based on what discussions we have today for the Board meeting going forward.

So with that, I'm going to get a quick drink of water

and would be happy to answer any questions.

Member Beach: Thanks, Bob. This is Josie. First of all, thanks for numbering your slides. That's always helpful when you want to go back and refer to a slide. I'm actually not going to do that but I do have a question for you or for Lara.

Operational information for De Soto, is there something out there that says that this was the mission -- I mean it's a 30-year timespan and I'm sure it changed numerous times over the years, but is there anything that we can grab onto that might give us some indication of why there was americium in the drain line or that tray you kept mentioning that they found with thorium?

Mr. Barton: This is Bob. I can take a crack at it. Again with the americium in the drain, when they found it they didn't know where it came from. And we haven't identified anything from that area or from previous time periods. I mean it might even be possible that it's been there since the start of the Mass Spec Lab. I don't know and we haven't found any timely documentation on that.

Again, a lot of this information comes from your daily logbooks, and area smear surveys, things like that, air samples for specific individuals that indicated either thorium work, for example, the 1971 worker who was cutting thorium oxide but that's based on an air sample. We don't have a planning document necessarily saying you know this operation is going to occur on this day for this worker, like we do have for those three documented thorium campaigns which are presented in NIOSH's Evaluation Report.

Member Beach: Okay. It seems to me like it would be a good idea to go and interview more workers that may have specific information for that time period.

So that was a -- I know you didn't throw it out as a suggestion, just a possibility, but it might be something to look at.

Mr. Barton: You're correct. My main intent with that discussion was to say if that's something we want to pursue, there are certainly some avenues and individuals that we identified through our review that might be helpful but I don't know of their necessary availability or even what knowledge they might have. But based on -- if it's the claimant population based on the CATI interviews or Department of Labor statements, they certainly seem to be in a position where they would have knowledge if it was out there.

Mr. Katz: Are there other questions from Work Group Members or from Lara?

Chair Schofield: I don't have any questions at this time.

Dr. Hughes: This is Lara. I don't have any questions at this time.

Member Field: This is Bill. I agree with Josie's suggestion about additional interviews. I think it would be helpful.

Mr. Katz: Andy, any thoughts?

Member Anderson: No, I think that's probably the next step is if there are some individuals who might have been there and been involved in operations that would have had some information on that, that would be certainly helpful. I mean there seems to be an indication that you know it's been identified but we don't have detail on how frequently or where it may have came from and that's -- that's something if we can track that down would be very helpful.

Chair Schofield: I've got just one question. When

we're talking about the amount of americium that went through the soil through there, are we talking about a matter of grams or kilograms?

Mr. Barton: Lara, please correct me if I'm wrong. I think the quantity they generally used was activity. And I think they were licensed to have up to 10 millicuries, again, and that was for the purposes of fabricating other sources for offsite parties. What we did not necessarily find was them actually necessarily ever doing that. We know they had the sources there. We know they had to be leak-checked. I noted the notice of violation and that they were a little bit late in doing it every six months but we know that they had americium sources there. I guess the question is whether they actually handled unencapsulated material.

And then, obviously, the other sources of potential exposure would have been if they're handling or processing decladded spent fuel. When you put the fuel in the reactor, it creates all sorts of transuranics, which include americium. And that was a source of exposure for workers at Area IV. Again, we're trying to figure out whether a similar situation also existed at De Soto, where you're handling and processing spent fuel that doesn't have its cladding on it and that's exposing that transuranic material to where it could be possibly inhaled or ingested.

Mr. Katz: Phil, do you have other questions?

Chair Schofield: No, I was just thinking that -- I mean there's nothing here that indicates really what they did. What they possibly did is an open question that we need answered.

Mr. Katz: Well I think that's why Bob, and Josie, and Bill Fields suggesting maybe at least one way to follow-up on that question might be to interview

some people who were present at the time periods of interest.

Chair Schofield: Yes, I agree with that. I was just curious about the kind of like this is actually a fairly small operation and as far as quantities go.

Mr. Katz: Right.

Member Anderson: Well, it says it's limited to the laboratory, where they maintained these basically as QA/QC.

Ms. Blaze: This is D'Lanie.

Mr. Katz: Before you get there, D'Lanie, wait. Can we just finish up?

Ms. Blaze: Yes, let me know.

Mr. Katz: So, Lara or Bob, I mean is there any way of figuring -- is there data information on what the quantity was in the drain, if that's at all indicative of how much of an operation there could been, whether it's a lab-scale thing or something more substantial?

Mr. Barton: I believe the quantity was 400 picocurie that they had found in the industrial drain. And again, even when they found it, the site people didn't know how it got there.

Mr. Katz: No, I'm not interested in how it got there. I'm just -- what -- for the rest of us, you have no idea what that means, 400 picocuries in terms of what kind of quantity of material they're talking about. You or Lara, can you sort of shed light on how significant that is?

Mr. Barton: Not with any confidence. I mean that's what they found at that time. We don't know when it got there. We don't know what the operation was. We

don't know -- we know that's what was in the drain but I mean is that the quantity used in whatever operation that got it there? I can't in good conscience try to guess at that.

Dr. Neton: Ted, this is Jim. I think -- Bob, did you say it was 400 picocuries of 40 grams of material?

Mr. Barton:: Yes, I think it was 400 picocuries --

Dr. Neton: That's 40 picocuries of americium per gram of material, which is a fairly low specific amount of activity. It would be -- that would not, in my mind, represent a very huge exposure potential. You'd have to generate a large airborne concentration of that material to get any kind of dose.

But Bob, I think what Bob is alluding to is what actually got the material in the drain in the first place.

Mr. Katz: Right, we don't know that. We don't know that.

Dr. Neton: That's more of the issue, I think, not necessarily that there's material in the drain, although that is an issue as well, but that's a minor issue related to what might have generated that contamination.

Mr. Katz: Right.

Dr. Neton: It's suspicious to me that it is americium only. I did some calculations based on ingrowth. I don't think it would be that from like plutonium-241 source term. This is the first I've seen this, well, since I read about it in the report.

We need to take a look at it and evaluate it. I think that's in general what we need in the path forward is NIOSH needs to react to SC&A's review.

Mr. Katz: Yes.

If there aren't any other questions, then it's time I think for D'Lanie to have her comments and questions. Yes, D'Lanie.

Ms. Blaze: All right, thank you, Ted.

Mr. Katz: Sure.

Ms. Blaze: Of course I'll address all of this in more detail at the Work Group meeting but I want to just touch on the fact that since the beginning of the dose reconstruction project, it's been accepted that Santa Susana, and Canoga, and De Soto's missions and goals were the same, that their workers were the same, their contract and contractors were the same during the same time period. They shared materials. They shared fuel. They shared record-keeping programs and, as a result, they share the same data limitations.

And so NIOSH considers these sites to be the same operationally and contractually, and they always have, since the beginning.

The Site Profile, the NIOSH Technical Basis Document, I just wanted to touch on briefly. The occupational and environmental PDF, there's two tables that apparently confirm the presence of americium and thorium at the De Soto facility between 1959 and 1999. And those can be found on page 9, Table 4.1 and page 12, Table 4.3.

And then we also had the DHS verification survey of the Mass Spec Lab at Building 104, which confirmed the presence of americium and thorium. And that further supports SC&A's Finding 2 of the contaminated tray and also their reference to the

contaminated waste streams.

So given the fact that NIOSH has always accepted that these sites represent the same entity operationally and contractually, we have seen SECs accepted in past together before because of the shared similarities and the undocumented worker rotation. And now there is no evidence that there was any effort whatsoever to confine americium and thorium to Santa Susana or to restrict those materials from existing at the De Soto facility.

It seems to me that SEC-246 should be a pretty easy thing to accept because I think in passing SEC-234, most of the work really here has been done.

I just want to thank everybody for their hard work and their attention to detail. And I look forward to seeing you guys in Redondo. And I hope that you'll take a look at those Technical Basis Documents that reference americium and thorium at the De Soto facility between now and then. Thanks.

ABRWH December meeting plans/other follow-up

Mr. Katz: Thank you, D'Lanie.

Path forward for the Board meeting, we have the SC&A presentation which Bob can update, just to cover what's been discussed at the Work Groups and you talked about a possible path forward to talk about with the full Board in terms of pursuing more interviews.

Is there anything else you want -- Board Members want to add about that presentation? So we don't have NIOSH presenting, just SC&A, which I think is fine and appropriate. And of course, we'll have D'Lanie commenting at that time formally in however way you would wish on this one.

But Work Group Members, do we have anything else we want to address for a path forward to the Board meeting?

Member Beach: The only thing I would suggest is the document that D'Lanie mentioned and I don't know offhand if that's something we might want SC&A to look at or comment. I'm just posing that for the Work Group.

Mr. Katz: Yes and I mean keep in mind that Lara's already covered that, really, work --

Member Beach: The case study? Yes.

Mr. Katz: Yes and the issue is with DOE and DOL.

Member Beach: Okay.

Mr. Katz: It's sort of an indirect matter for what you guys are trying to in evaluating the petitions.

Member Beach: Right. I just didn't know if there was anything else in it besides what is out of our purview. So thank you.

Ms. Blaze: Was that Josie that just asked that question?

Member Beach: Yes, it was Josie.

Ms. Blaze: It's me, D'Lanie. Were you asking about the case study or were you asking about the NIOSH Site Profile document?

Member Beach: No, I was asking if it was something we would want SC&A to pursue. I was asking that of the Work Group Members.

Ms. Blaze: Of the case study or of the Site Profile?

Member Beach: No, the case study.

Mr. Katz: The case study.

Ms. Blaze: Okay, thanks.

Member Beach: Okay and no, I understand that's probably not appropriate at this time.

Mr. Katz: Work Group Members, anything else for path forward for the Board meeting, for work that must be tasked after we discuss this with the Board?

Okay. Okay, well, then I think it's pretty clear what we need to do to be ready for the Board meeting. And also I'll just say, D'Lanie, since you're on the line, I mean we will get these SC&A reports to you before the Board meeting, I certainly hope. They were just cleared by DOE but they should be -- so they should be ready pretty soon to get to you and also the parts for the Board meeting.

Ms. Blaze: I sure appreciate it, Ted. Thank you.

Mr. Katz: Yes, sure.

And I think then, I think we've covered the waterfront for today's meeting, unless anyone has anything else to add before we close.

Chair Schofield: Not at this time.

Mr. Katz: So thank you, everybody. And I think, based on this discussion again, we probably can shrink the time a bit for this session. It's also not an actionable item for the upcoming Board meeting and we probably allotted more time than we need for this. I mean I'll check it on the -- what I have on the agenda but I believe that we have probably an hour and a half for this and we probably don't need an hour and a half.

Chair Schofield: No.

Mr. Katz: We can probably shrink it down, yes.

Okay, so thank you so much, everybody. And thank you, D'Lanie for joining us for this meeting. And we will see you next week.

(Whereupon, the above-entitled matter went off the record at 12:14 p.m.)