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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING ON POTENTIAL REVISIONS TO

BRANCH TECHNICAL POSITION ON

CONCENTRATION AVERAGING AND ENCAPSULATION

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THURSDAY,

FEBRUARY 24, 2011

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ROCKVILLE, MARYLAND

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The public meeting convened at the Legacy Meeting Centre, 1775 Rockville Pike, at 8:00 a.m., BRET LESLIE and PATRICIA ADELSTEIN, Facilitators, presiding.

PANEL MEMBERS PRESENT:

JOHN COCHRAN, Principal Member of the Technical Staff, Sandia National Laboratories

ABIGAIL CUTHBERTSON, Foreign Affairs Specialist, Department of Energy

DIANE D'ARRIGO, Nuclear Information and Resource Service

LISA EDWARDS, Nuclear Energy Institute

NRC STAFF PRESENT:

LARRY CAMPER, Director, Division of Waste Management and Environmental Protection

PATRICIA ADELSTEIN, Co-Facilitator

MAURICE HEATH, Project Manager, Low-Level Waste Branch

JAMES KENNEDY, Senior Project Manager, Low-Level Waste Branch

BRET LESLIE, Co-Facilitator

CHRISTIANNE RIDGE, Senior System Performance Analyst, Performance Assessment Branch

TABLE OF CONTENTS

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

(8:32 a.m.)

II. OPENING REMARKS

CO-FACILITATOR LESLIE: Good morning. My name is Bret Leslie. And I am going to be -- I am an NRC employee, and I am one of the two facilitators today. I am going to be joined this afternoon. And she is going to be helping out this morning, Patricia Adelstein. She is over there. So if the people in the audience should decide that they have questions this morning, you can either fill out one of the yellow cards. And Patricia has some. And that way I'll be able to keep the flow of the meeting going.

Before we get started in the substantive portion of the meeting, I need to go through a few of the process things to consider. Basically I wanted to remind folks that this today the type of meeting that we are doing is a roundtable, which is not the same as what we often do, which is more like a public open house type of thing. But here this type of setting is focused on having a good discussion around the table. There will be plenty of opportunities for people in the audience and on the phone to participate.

But, again, what NRC is trying to accomplish through this format is to get a richer type

of data than we might get with just individuals coming up and speaking. And so one of the challenges to the people around the table is that to the extent that you can talk about what your positions are but to also be listening very carefully and trying to get a richer and probing questions to the people across the table or next to you so that we can get a clear understanding of the concerns.

Before I get and go through the agenda, there is one other thing I want to talk about, which are our ground rules for today. I put them up here on the paper, but I will talk through them.

Again, to facilitate that discussion, we would ask that only one person at a time speak, that we know we have some very interested stakeholders around the table. They will have a lot to say. And we have a lot to cover. So I am going to try to ask you to be as constructive, concise, and crisp in your comments and questions.

My job is to make sure that all the viewpoints are heard today. And for the panelists, to keep the flow going, what I am going to ask you to do is turn over your name tag. It doesn't matter one way or the other. But you won't have to raise your hand. That way you will understand I will be able to

identify who needs to speak.

In that regard, just because you turned it over first and second and third, it doesn't necessarily mean that I will follow that. I will try to keep a discussion thread going, but be aware that I will get you eventually. So I ask for a little bit of a patience.

In terms of the people here in the audience and on the phone, there will be a couple of times specifically -- and I will talk about that in a second when I go through the agenda -- where we will allow time for those comments.

But depending upon the flow of the meeting, if we talk through an issue and we're getting ahead of schedule, I might break and say, "Well, are there comments on the particular topics at that point in time?" And for those people who have identified their speaking, I just want to let you know I'm not promising that that will happen, but if the flow is going well, we will try to get you involved as well.

Let me see. We will also as part of that discussion have a parking lot. So if there are issues that arise that are not right on the mark in terms of what the focus of the meeting today is, we'll identify those. And we'll get back to them at the end of the

day.

Let's see what else. And one of the things I would like to do is to go around the table very quickly. I'm sorry, David. I turned you over. Well, this will be a good test of the PA. For those at the table, it is a push-on. You don't have to hold it on. And when you are done, push off. We have a transcriptionist today, Brandon, who is going to need to not have everyone talking at once.

So, David, if you could start and go and speak into the mike and say who you are and your affiliation? And then we'll go around. So the button is right here.

MR. JAMES: My name is David James. I am here representing Electric Power Research Institute. I've been doing research on this issue now for about five years. So in my context, it is moving forward.

MS. EDWARDS: Good morning. I am Lisa Edwards. And I do work for the Electric Power Research Institute, but today I am representing Ralph Anderson for NEI. And Ralph had other obligations. So I am sitting in for him.

MR. JOHNSON: I'm Graham Johnson. I work for Duke Energy. I am supervising scientist in the corporate office over radiation protection technical

staff. And I will be representing Duke Energy and utilities in general.

MR. LePERE: Good morning. I am John LePere representing WMG, Incorporated. We are a nuclear engineering firm that has been servicing the commercial industry for some 30 years.

MR. LEWIS: My name is Mark Lewis, and I am representing EnergySolutions. EnergySolutions operates the Barnwell disposal site, the Clive disposal site.

MS. CUTHBERTSON: My name is Abbie Cuthbertson. And I work for the Department of Energy National Nuclear Security Administration Global Threat Reduction Initiative. And I manage source recovery efforts on behalf of that program.

MR. FORDHAM: My name is Earl Fordham. I am with the State of Washington, past resident inspector out at the Hanford disposal facility. And I am representing the Organization of Agreement States and CRCPD.

MR. LETOURNEAU: Marty Letourneau with the U.S. Department of Energy, the Office of Environmental Compliance within the Office of Environmental Management. I primarily deal with our DOE radioactive waste management order, DOE order 435.1, and our

low-level waste disposal facilities throughout the Department.

DR. COCHRAN: John Cochran, Sandia National Laboratories. And we are providing task order support to the NRC.

MR. KENNEDY: Jim Kennedy, NRC staff, Low-Level Waste Branch.

DR. RIDGE: Christianne Ridge, NRC. I am in Performance Assessment, NRC. And that group provides technical support for the part 61 rulemaking and also for guidance associated with low-level waste.

CO-FACILITATOR LESLIE: And right now we are still waiting for the last panelist, which is Diane D'Arrigo. And we will get her to introduce herself when she shows up.

Again, one more thing. Before we get into the substantive portion of the discussion today, I want to run through the agenda for those at the table and audience and on the phone. First we are going to have Larry Camper come up and provide a welcome and an overview. And Maurice Heath will follow him with regulatory consideration. And it is important to understand the role that they are serving.

This is going to be a very focused discussion today on one particular piece of NRC

guidance, which is a Branch Technical Position. And so what Larry is going to be doing is going to be laying the foundation or the outline of how this fits into everything. And then Maurice is going to come up here and start building the regulatory bases or the framework for that foundation.

At that point in time, I'm going to allow the panelists to ask only clarifying questions for any of the things that Larry and Maurice have said, again kind of the framework for our discussion today so that you are clear on what we are trying to accomplish and kind of the background.

At that point we will have a technical overview of the concentration averaging Branch Technical Position by John Cochran. And that will be followed up by Christianne Ridge, which will take us -- and, again, John is putting the technical bricks into that foundation.

So after you have heard from Larry and Maurice and John, you will basically have the framework for the discussion. Then we will have Christianne come up. And we will lay out how we will guide through that discussion.

And at that point, we will also go back to the panel to see if you have any clarifying questions

on the technical aspects of the framework and how we intend to proceed. And, again, those questions will be just limited to the panelists because I know you guys all have a lot to say and we are just trying to keep it moving as well as we can.

So at that point in time we will have a break in the morning. And then we will have a short break. Then we will come back at 10:00 o'clock sharp. And we will start the discussion. And I will be facilitating the discussion. We will be showing how we will proceed. We will have some slides up on the screen here.

Diane, could I get you to introduce yourself? You will have to press the button on.

MS. D'ARRIGO: I'm Diane D'Arrigo with Nuclear Information and Resource Service.

CO-FACILITATOR LESLIE: Thank you.

And then we will go through discussion. And what you will hear is we have four kind of areas of discussion and three discussion slots. And so my challenge will be to ensure that we get all of that covered in the available time.

We will break for lunch at 11:45. And then we will come back. And at that point Patricia is going to spell me and come up and begin to facilitate

the discussion period at that point in time.

And after that -- I have messed up already. Right before lunch we are going to have a period of time where we will turn to the audience, a specific period that is at 11:15. And we will also at that point in time take the questions and comments from the audience and then turn to the people on the phone and get their questions and comments.

So that is the first official point where the public here in the room and on the phone can comment. In the afternoon, we will again have this continuing discussion. And we will have a public questions and comment period also at 4:20. And we will do the same thing. We will turn to the people in the audience here and then turn to the people on the phone.

After that break in the afternoon, I will pick it up again and close out. And so you will have some continuity. I think at the very end, Larry is going to come back and kind of summarize and have some concluding comments.

The goal is obviously to finish on time, but, more importantly, the goal is to ensure that we have an adequate discussion so that the staff can take your comments and go back and do all of the work that

they need to do.

So I guess with that, I am going to turn it over to Larry Camper to begin him laying out the foundation.

MR. CAMPER: Thank you, Bret.

## III. WELCOME AND OVERVIEW

MR. CAMPER: Good morning, everyone. Glad you are all here, good turnout, actually. I am Larry Camper. I am the Director of the Division of Waste Management and Environmental Protection.

And within my division, we have responsibility for maintaining and updating the BTP, which, of course, as you all know, is very much of a worker bee document. This one really gets used extensively. So what we are going to do today I think is very important as we look at updating that document.

I also want to mention while I am up here Drew Persinko -- Drew, would you stand up? Drew just became my deputy on the environmental and low-level waste side. So he's been with us in that role now for two or three weeks or so drinking out of a fire hydrant.

And K. C. is one of our administrative assistants. And she is here helping us keep things

moving. And, of course, we can't make these things happen without that kind of assistance.

So this is a public meeting where we are looking at the revisions to the Branch Technical Position concentration averaging encapsulation. In terms of our purpose, we want to gather information on the key issues associated with the BTP, the Branch Technical Position.

And this is the first of two public meetings that we plan to hold. We anticipate holding another one probably in Albuquerque, New Mexico in October, either just before or just after the low-level waste forum meeting, so provide some folks in that part of the country an opportunity to participate actively as well.

In terms of scope, we want to discuss the potential revisions to the BTP, which include averaging of discrete items of hardware, mixtures of low-level waste, and a package, sealed sources, blending of waste as consistent with direction from the Commission to risk-inform that particular topic.

Bret mentioned in his comments and I would only reiterate this needs to be a collaborative discussion. We have an extremely talented panel. And we know that you have lots of views about this matter.

We also have a great deal of experience in the audience. I look around and know many of you in the audience, of course. And the experience is profound. So you can do a lot to help us make this document better than it currently is.

Next slide, please. So in terms of BTP, why are we here? In 2007, the staff within the Division of Waste Management and Environmental Protection dealing with the low-level waste program undertook a low-level waste strategic assessment.

We did that because we found that the conditions in the low-level waste arena were changing rather dramatically. The low-level waste program itself is staffed with only what's called a maintenance level of FTE. But, yet, there were lots of issues confronting the staff.

And so we did the strategic assessment to identify. And out of that came the identification of seven high-priority items. One of those high-priority items was to update the BTP. And at the time we said we wanted to update the BTP, we told the Commission in the paper that we sent up we want to make it risk-informed and performance-based and we want to make it more user-friendly, more readable, of more utility.

We started that process with Sandia Labs. We actually created an updated version, more user-friendly, no changes to the technical content. That was put out. That was published. But then along the way the topic of blending came along. And clearly the staff knew that blending was something that we needed to be talking about in the BTP as well.

So we put the development of the BTP on hold temporarily until we could communicate with the Commission about the topic of blending, get back Commission direction as to how it wanted to handel the topic of blending.

And the Commission came back in the staff requirements memorandum, the SRM, for SECY-10-0043 and gave the staff some rather specific direction as to what to do about the topic of blending. And Maurice will cover that in more detail during his presentation, which follows mine.

Next slide, please. In terms of our expectations, they're fairly straightforward, as you might expect. As I said, we want to improve the clarity of the document. It is a great document. It has worked well. It has been successful. But it is not user-friendly. It is not easy to follow. So we think it can be put together in a way that is much

more clear and easier to understand.

We do need to risk-inform and performance-base the document. Certain aspects of the document are not necessarily risk-informed. Factor of ten, for example, is one we will talk a lot about today. And, of course, we want to respond to the Commission's direction coming out of SECY-10-0043 regarding the blending of low-level waste. They specifically direct us to risk-inform and performance-base the blending positions in the BTP. And they had some specific positions on Greater-Than-Class-C waste. And, again, Maurice will cover that in more detail.

Next slide, please. Now, I know that you all know the BTP as well or better than I, but bear with me for the public record. The BTP has eight major components to it.

Blending is but a small piece of what is contained within the BTP. So the major components in the BTP are the mixing of homogenous waste types or streams; solidified and absorbed liquids; mixing of activated materials or metals; contaminated materials; mixing of cartridge filters; waste in High-Integrity Containers, HICs; encapsulation of solid material; and mixing of dissimilar waste streams.

As I said, our objective is to make this document more risk-informed, performance-based as it relates to all eight of these components, not just blending.

Next slide, please. Now, to utter the term "risk-informed, performance-based" when you hear those words, it means different things to different people. I think we generally have an understanding of what we mean by "risk-informed, performance-based," but I'll bet you that if we went around the room, we would have subtle differences in our opinions.

What is important for our discussion today is understand that the Commission has a defined position on risk-informed, performance-based. It means something in particular in our regulatory lexicon. So that is what we are working toward when we say "risk-informed, performance-based."

In NUREG 1614, NRC's strategic plan for all of the agency's activities, the concept of being risk-informed and performance-based is articulated. So this is the definition that we strive for when we look at making this document more risk-informed, performance-based.

In terms of being risk-informed, it means that decision-making approaches that use risk

insights, engineering judgment, safety limits, and other factors for establishing requirements that focus on issues commensurate with their importance to public health and safety.

Objective criteria does exist or can be developed to assess performance. Licensees have flexibility to determine how to meet the established performance criteria in ways that will encourage and reward improved outcomes. So risk-informed, performance-based, terribly important part of what we do as a regulator, terribly important part of what we are trying to achieve today. And that is what we mean by it.

In terms of the performance-based component, it means that performance and results as the primary basis for decision-making. Performance-based regulations have these attributes, among others. They need to be measurable, calculable, or objectively observable parameters and can be developed to monitor performance.

Next slide, please. The panelists have gone around and introduced themselves. I want to echo the thanks that Bret gave to you. Each of you bring a great deal of expertise and experience and talent to the table and different views.

These types of panel discussions that we have had we found to be a great tool to help us improve our regulatory process. So, once again, the contribution you make today is extremely valuable to the process. And I thank you very much for that.

I would also want to thank Patricia and --

CO-FACILITATOR LESLIE: Bret.

MR. CAMPER: Bret. I've only known Bret for 25 years.

-- but Bret and Patricia for what they are doing today as facilitators. I must tell you, though, by the way, they are proteges of Chip Cameron. So try not to hold that against them. Bret said he would try to live up to that reputation and say, "Well, parts of it, you know, just parts of it." But seriously Patricia and Bret are part of the cadre of facilitators that have been trained within the NRC. And he is going to do a great job for us.

Bret, by the way, has involved in the high-level waste program for many, many years, is a strong technical expert in his own right. So, in addition to his facilitation expertise, he is a very sharp technical guy as well.

Next slide. Okay. Just to quickly recap the agenda, Maurice will follow me and lay out the

regulatory infrastructure. Following that, John Cochran with Sandia Labs will talk about the technical components of the current BTP. John will be talking about the current construct.

Then there will be an overview of the Federal Register questions. I think there were nine of them, Christianne. And Dr. Christianne Ridge of our staff will lead you through the construct of the questions and, more importantly, how we intend to discuss them as we proceed through our dialogue today.

Of course, there will be discussion with the panel members and the public. Patricia and Bret will lead the way with that. And I do encourage the members of the public to actively participate when those opportunities are afforded to you.

And to engage the panelists in dialogue, we want to have a meaningful collaborative discussion and get all of your views and expertise on the table.

So don't be shy. I know you will not be, but don't be shy. Be actively engaged.

So I think, with that, one final point I would make is that we do want to maximize the stakeholder -- last slide, last slide -- maximize stakeholder input. Today is an opportunity. It is the first opportunity. Well, actually, the first

opportunity was when we published the nine questions in the Federal Register notice. This is the first active public engagement opportunity, if you will.

There are a lot of things going on right now in the low-level waste program in parallel. There is the unique waste streams rulemaking. There is the look at part 61 from perhaps a comprehensive nature. There is the updating of the Branch Technical Position.

So you are seeing a number of different activities depicted on this particular chart. What we have done is to highlight in the darker yellow the color the ones that deal with the ongoing work on the concentration averaging BTP.

The meeting, of course, today here in Rockville, the comment period for the BTP, Federal Register notice that we published closes on the 15th of April.

We are going to brief the ACRS on the BTP here in Rockville in August. We plan to issue the draft BTP for public comment in October. And then I mentioned earlier conducting a public workshop in New Mexico in October as well. And then the goal is to issue the final BTP in June of 2012.

So there will be a number of opportunities

along the way for public input to the process, be it through comments, be it through observing different sessions that can take place or, of course, active participation in meetings like this.

So I think, with that, I will stop and let you get down to the serious work with Maurice giving you an overview of the regulatory infrastructure. I thank you very much for being here again, and I thank you for your attention.

MR. HEATH: Good morning. Thank you, Larry, for that.

IV. REGULATORY CONSIDERATION

MR. HEATH: What I would like to do today is just go over the regulatory infrastructure. Again my name is Maurice Heath. I am a project manager in the Low-Level Waste Branch and being the lead in that branch for going through the revisions of the BTP.

Next slide, please. Quickly we want to go -- the purpose of the talk today said "Identify and describe the regulations and guidance related to the concentration averaging and encapsulation." And the second thing I want to do is explain the direction given by the NRC Commission in SRM SECY-10-0043.

Next slide, please. Now, in that SRM, the Commission approved staff's recommended option 2 in

the SECY paper 10-0043. Things that also came out from the Commission's direction were for us to obtain a review from the Advisory Committee on Reactor Safeguards, ACRS. As Larry has mentioned, we will be doing that in August of this year. One other thing that came up was the Commission was explicit when they said, "Do you include the waste at Greater-Than-Class-C, GTCC, concentrations." And also one other point in that direction was to determine a standard for homogeneity.

Next slide, please. Now, in the SECY, option 2, option 2 was the blending position to be risk-informed and performance-based. Now, that included revision of the BTP in concentration averaging obviously. With that, we want to define homogeneity and sampling and also to eliminate the factor of 10 provision.

Now, also in option 2, it was stated that there would be a requirement for a site-specific intruder analysis, which would be risk-informed, performance-based. And that will address blending. And that will be part of the unique waste stream's rulemaking effort that is going on right now.

Also in that option 2, it stated that the staff would revise the volume reduction policy

statement. We will update that statement. And also we will issue an interim guidance to agreement states.

Next slide, please. Now, the regulations that are over-arching for the disposal of low-level waste that the guidance fits into are 61.42, which is a provision of the regulations that's for an inadvertent intruder to ensure protection of any individual inadvertently intruding into a disposal site.

Also in the regulations we have 61.55, which is the waste classification. That contains the tables 1 and 2. It defines class A, B, and C waste. And also at 61.55(a)(8), it states that the concentration of a radionuclide may be averaged over the volume of waste. So this is where the BTP directly goes to the regulations that allow for concentration averaging.

Also the regulation that pertains is part 20, appendix G, which describes the requirements for transferring low-level waste for disposal and filling out waste manifests for shipment of waste. And also part 20 requires the classification of waste A, B, or C to be identified when the waste is being shipped for disposal. And that is a key point that is in the regulations.

Next slide, please. Now, this slide is just an example of the waste classification table that's contained in 61.55. It shows class A, B, and C. It shows that they are a function of concentration. And it's curies per cubic meter.

But what I want to point out with this table is that this table kind of -- it identifies why we have a BTP because what it does, it brings the real world heterogeneity in waste to the regulation, which gives average values in these tables.

So the BTP is the implementing guidance that is used among many in the industry. That fits it and brings it all together.

Next slide, please. Now, the concentration averaging guidance, we have the one that is standing now is 1995 concentration averaging Branch Technical Position, as you know. That is the one that we are revising.

Now, contained in that is mixing homogeneous waste, which is blending, an issue that has been at the forefront or the past year. And that is only one piece of the BTP. And that's one important thing to point out.

Now, also in that guidance is a factor of 10 rule. And also in the guidance, it states that

operation efficiency or occupational dose reductions have considerations within that guidance.

There are other factors in the BTP, but I will let John Cochran -- he's going to get into more detail about that in his presentation.

Next slide, please. So, to summarize it up, key things to know about my talk: waste classification is related to disposal for one thing. Concentration averaging is authorized by the regulations. The BTP is an implementation guidance document. And we will have this issue, emerging issue, called blending, which is very important as one piece of the BTP, as I stated earlier. And the role of the classification table, the role of the waste classification table, is a way to get from real world heterogeneity to average concentrations in the table in order to show that you can meet the regulatory requirement.

Now, with that, I will go and turn it back over to Bret. Thank you very much.

CO-FACILITATOR LESLIE: Okay. At this point if Larry and Maurice can remain handy? If the panelists have any clarifying questions on either Larry's or Maurice's talk in terms of how, what the framework for our discussion is today?

And, again, I will remind you that the way we are going to identify who needs to talk is to turn over your name tent. Okay. Diane, I'll start with you. Can you go ahead and make sure you press the button for the mike.

MS. D'ARRIGO: When the Commission said not to include Greater-Than-Class-C, when is the Greater-Than-Class-C defined?

CO-FACILITATOR LESLIE: Larry, I'm going to toss it to you.

MR. CAMPER: Okay. Let's just start off with a good one. That's a good question. The Commission was very clear that it did not want to see waste at concentrations that equate to GTCC be considered for blending. And when we were communicating with the Commission, when the SRM was prepared, we pointed out to the Commission concentrations of waste that would be at Greater-Than-Class-C levels.

So the specific direction is you can't blend waste at that concentration. Now, waste is classified technically, by definition, for disposal. It does not have a classification until it is defined for disposal.

Now, we all understand that there are ways

out there that, in fact, exist at GTCC levels, of course, but it is when you dispose of it is when it becomes GTCC waste by definition.

But the point here is waste at concentrations that would equate to should not be blended. That was the Commission's direction.

MS. D'ARRIGO: So if the concentrations are before it is ready to go to a disposal site, like if it were going to go to a processor, then it could do that because it is not greater than C yet.

MR. CAMPER: That's correct, yes.

CO-FACILITATOR LESLIE: And, Diane, just to remind you that -- well, you haven't actually seen that, but that is going to be one of the questions that will be addressed a little bit later today in the presentation.

David?

MR. JAMES: I had basically the same question. This is David James. I had basically the same question in relation to how the Commission expected those boundaries to be drawn for the Greater-Than-Class-C. I think that is a relatively confusing issue around the table.

MR. CAMPER: I think you are going to help us with that.

(Laughter.)

MR. JAMES: We will be glad to work with you on that.

MR. CAMPER: It is a challenging issue. It was very clear that, as I said before, the Commission did not want to see waste at those concentrations. That category of waste was not suitable for blending.

Now, the particulars, the boundaries -- this is an excellent opportunity to help define that within the BTP. But you raise a very good point, as did Diane. I think that is one of the more challenging issues we face.

CO-FACILITATOR LESLIE: Okay. Given that I don't see any more name tents turned over, I am going to turn it now to John Cochran to begin to describe the technical framework for the discussion and going through the BTP.

I would like to remind everyone, for the people on the phone to ensure that they remain muted. And for those of you who have cell phones, please mute those as well.

Anyway, John?

## V. TECHNICAL OVERVIEW OF CA BTP

DR. COCHRAN: Good morning. I am going to

provide a quick technical overview of the eight elements of guidance found in the BTP.

Next slide. Before going over the guidance of the BTP, I did want to say a few words about the purpose of the BTP. Fundamentally the BTP is there to protect the inadvertent human intruder. And the BTP does this two ways: one by requiring relative radiological uniformity in each waste package so that we are assured that the actual disposal conditions are consistent with the conditions that were analyzed in the part 61 EIS. And in the part 61 EIS, the source terms were assumed to be homogeneous.

Second, the BTP sets boundaries for disposal of encapsulated, sealed radioactive sources, and similar waste streams. And these boundaries were defined not in the part 61 EIS but in the BTP itself.

Now, it is the understanding of the staff here that one of the reasons the BTP was issued was that there were accidents involving sealed radioactive sources in the late '80s; for example, the one in Goiania, Brazil. These raised the awareness and concern of staff that maybe sealed radioactive sources hadn't been properly addressed earlier and that guidance was needed to help address the disposal of sealed radioactive sources.

Next slide. So here are the eight categories of guidance found in the BTP. The BTP deals with homogeneous waste types: solidified and absorbed liquids; activated metals; contaminated materials and cartridge filters; disposal of waste in high-level containers, or HICs; encapsulation of sealed radioactive sources; mixing of different waste types in a single container; and, then, finally, a ninth element, alternative provisions.

If you are familiar with the BTP, you know that the BTP actually has separate breakout sections for activated metals, contamination materials, and cartridge filters. And in studying the guidance, we found the guidance to be the same for all three. And so for the sake of time, we have put all three together in one single discussion here.

Next slide. Now, there are a few things in the BTP that we are not going to talk about today. There is a nice table in the BTP for calculating volume; a requirement, of course, for a QA program. And then microcurie sources mixed with other wastes are exempt from the guidance in the BTP.

Next slide. There are some terms used in the BTP that are unique to the BTP and not found in part 61. One of those key terms is "waste types."

The BTP talks a lot about waste types. Waste types are simply wastes with similar physical properties. And maybe this is best explained through examples of waste types: Activated metals, homogeneous materials, contaminated materials. Those are all examples of what the BTP calls waste types.

The BTP also talks quite a bit about similar waste types. So if I had a container and the only thing in the drum was activated metal, pieces of activated metal, that would be a container of similar waste types. If I wanted to take activated metal and put some contaminated soil in there, that would be a container with dissimilar waste types in it.

Next slide. So I am going to have a road map in front of each of the eight topics. So here is a road map.

Next slide. Homogeneous waste types. So the BTP defines homogeneous waste types. And these are wastes in which the radionuclide concentrations approach uniformity in the context of the part 61 EIS.

Now, the BTP sort of automatically defines a number of wastes as being homogeneous waste types. So spent ion-exchange resins, filter media, solidified liquids, trash, and contaminated soil, if the fill volume is greater than 90 percent, all of these are

sort of automatically classified as homogeneous waste types by the BTP. The BTP tells us that if we have a homogeneous waste type, we can do a simple mathematical averaging: curies divided by volume or if you've got transuranic curies divided by weight.

Next slide. The BTP goes on to tell us that homogeneous waste types may be mixed together. In fact, the specific phrase is similar homogeneous waste types may be mixed together if you want to classify the mixture based on the component in the mixture that had the highest classification going into the mixture.

So that is one choice. I've got a mixture. I find the component in the mixture that had the highest classification. And I classify the resulting mixture based on that component or I can classify the mixture doing a mathematical average so long as all of the contributors to the mixture are within a factor of 10 of the average of the resulting mixture. So this is the factor of 10 rule that showed up in blending.

The BTP goes on to state that some mixtures of homogeneous waste types are actually exempt from the guidance. So if you have got a mixture from a design system for the collection of

homogeneous waste types for multiple sources at a facility, for operation efficiency, or dose reduction, those wastes are except from the guidance on mixing.

Next slide. Next slide. BTP guidance on solidified and absorbed liquids. I think this one is pretty straightforward. If you have got solidified liquids, you can average over the final waste form: either by volume or if you have got transuranics by weight. If, on the other hand, the liquids were merely absorbed, then you need to average over the original volume or the original weight and not the final weight.

Next slide. So this is the guidance on activated metals, contaminated materials, and cartridge filters. We put all three together because the requirements are the same for all three. We call this guidance for discrete waste and mixtures of discrete waste in a single container.

So you have got a couple of choices here. One choice is that you can classify the mixture based on the classification of the piece in the mixture with the highest classification.

So I have got a drum full of pieces of activated metal. I look in the drum. And I find the piece with the highest individual classification. And

if I am willing to apply that classification to the entire mixture, then I am done or we can do a mathematical average over the entire mixture. However, certain criteria have to be met. And these criteria ensure relative radiological uniformity in the disposal package. I am going to quickly go over the criteria. And then we will go over each of them in some detail in just a minute.

So if there is an individual piece in the mixture that is less than .01 of a cubic foot and exceeds table A, it has got to be pulled out and managed separately. If the gamma emitters control the classification of the mixture, all pieces in the mixture would have to be within a factor of 1.5 of the average of the mixture. These are ensuring radiological uniformity of what is in the package. Right? We are reducing the homogeneous.

For the gamma emitters, any piece in the mixture if it exceeds the table B values, it has got to be pulled out and managed separately. And there is a factor of 10 rule for the non-gamma emitters as well. So all pieces within the mixture have to be within a factor of 10 of the average of the mixture for the non-gammas.

Next slide. So now we are going to go

through these a piece at a time. Oh, I'm sorry. There are some terms that are used for this part of the guidance that I want to discuss first. And then we will go over the guidance piece at a time.

So the BTP talks about primary gamma emitters. And there are three primary gamma emitters, as defined in the BTP, cobalt-60 and niobium-94 and cesium/barium-137, and then the term we use, "non-gamma emitters," and these are listed here.

Next slide. So here is our guidance. You can classify the entire mixture, conservatively classify the entire mixture, based on the classification of the piece in the mixture with the highest classification. It is simple, and you are done or you can classify the mixture based on a mathematical average of everything that is in the mixture, but you have to meet up to four criteria to reduce the homogeneous of what is in the mixture.

Next slide. So now we are going to go through those four criteria again. So the first criteria is that if there is any piece in the mixture that is smaller than .01 of a cubic foot -- that's bigger than you might think, by the way. I was thinking it was about this big, and it's actually about the size of a coffee cup. So pieces smaller

than .01 of a cubic foot that exceed the table A values must be pulled out and managed separately. And this ensures that sealed sources and sealed source-like waste are managed appropriately.

Here is the table A value. I am not going to go through it, but I will point out that for class C for cesium, the limit is 30 curies. We are going to see that 30-curie limit again in a minute.

Next slide. If the primary gamma emitters control the classification of the mixture, then the concentration in any one item in the mixture can't be more than a factor of 1.5 of the average concentration of the mixture. If it exceeds the criteria, the piece has to be removed and managed separately. And, as I mentioned earlier, this ensures relative radiological uniformity of the pieces in the mixture.

Next slide. So those two were for the gamma emitters. Now for the non-gammas. If there is any item in the mixture that exceeds the table B values, that piece has to be removed.

Here is the table B. I am not going to go through it. It is in the BTP. We had trouble figuring out where table B came from. It turns out it is approximately one-fifth of the appropriate class limits. So for the class C limit, it is about

one-fifth of each or the equivalent of about what would be in a 200-liter drum. So it appears that the table B prevents averaging over containers larger than about 200 liters, or a 55-gallon drum.

Next slide. And, finally, there is a factor of 10 rule for the non-gamma pieces. So the non-gamma activity -- and this is per nuclide -- the non-gamma activity of any item in the mixture can't be greater than ten times the average for that nuclide in the average of the mixture.

And this applies to something called classification controlling. It's a phrase used in the BTP, "classification controlling, non-gamma nuclides."

The BTP tells us that these are the non-gamma emitters that are greater than .01 of their value in either table 1 or table 2. And, again, this criteria ensures radiological uniformity of the pieces in the mixture.

Next slide. Waste in higher-integrity containers. So we are over the hurdle here. That was the tough one. The next few are pretty straightforward, I think. So if you are going to dispose of waste in high-integrity containers, you need to classify the waste based on the waste itself and not the high-integrity container. You can't take

credit for the weight or the volume of the container. That's all that BTP tells us for disposal with HICs.

Next slide. Next slide. Encapsulation of sealed sources and sealed source-like waste. The BTP sets bounds for the encapsulation of sealed sources and similar waste, tells us that the maximum encapsulating volume or mass can't be greater than a 200-liter drum, .2 cubic meters. You can put the waste in something bigger, but the BTP says you're not going to average over something more than 200 liters.

It sets a gamma dose limit on the surface of the package. This is to be calculated at 500 years, can't be more than .02 of a millirem per hour surface dose at 500 years. It sets a limit for the dispose loop, cesium/barium-137 at 30 curies at the time of disposal. And then for the non-gammas, it would be that the appropriate class A, B, or C limit when averaged across the entire encapsulating media. So that is going to be your limit there, just look it up in the table.

The BTP tells us that these policies were put in place to prevent folks from encapsulating radioactive waste solely for the purpose of diluting the waste.

Next slide. The 30-curie limit is of some

interest to folks. And I would point out that the 30-curie limit is actually derived in the BTP from a couple of gamma source-handling scenarios that are presented in the back of the BTP. These scenarios were done to ensure that the intruder dose from exposure to a discrete gamma source is within the envelope of safety that was defined in the part 61 EIS.

Next slide. Mixing the different waste types in a single container. So an example might be a drum. The drum contains pieces of activated metal. And you would like to put contaminated soil in there. So I have got two different waste types: a homogeneous waste type, contaminated soil; and I have got pieces of activated metal.

The BTP tells us it is okay to do this so long as you are willing to classify the mixture, conservatively classify the mixture, based on the classification of the piece in the mixture that has the highest classification.

So I look in the mixture. I find the one piece that has got the highest classification. If I am wiling to classify the entire mixture based on that, I can mix dissimilar waste types in a single container. If, on the other hand, you are unwilling

to do that, then you need to seek alternative provisions.

Next slide, which is a good lead into alternative provisions. So we have gone through the eight elements of guidance in the BTP. This is really a ninth element. This is alternative provisions. So if the eight elements don't describe your situation and you want to do something that is different from the BTP, then this is the out clause here.

Alternative provisions remind us that under 61.58, the Commission may authorize other classification systems. Then the BTP goes on to state that classification alternatives other than what is in the BTP may be considered acceptable.

And the BTP gives us some examples of alternative provisions that might be acceptable; for example, where the physical form would justify a different intruder scenario than those used in the development of part 61.

And a reminder, of course, that we always have got to meet the subpart C requirements to the performance objectives. The BTP even gives an example.

I guess alternative provisions were only used once I think in their development. The example

given in the BTP is where they were used. We have a large, very large, intact activated component that was filled with cement.

Next slide. So I have done a quick review of the eight elements of guidance that are in the existing BTP. And over the years, the NRC has received a number of suggestions on how the BTP might be updated. A good many of these suggestions were used to create the questions that were published in the Federal Register. And Christianne is going to speak next and go over those questions.

Thank you.

DR. RIDGE: Thank you, John.

## VI. PRESENTATION - CONTEXT AND FLOW CHART

DR. RIDGE: I want to reiterate Larry Camper's point this morning that this discussion is going to be -- we anticipate it will be very useful to us in our revision of the Branch Technical Position.

And to get the most out of this discussion, we would like to try to focus it on the questions that were in the Federal Register notice. The Federal Register notice was available as you came in.

If you didn't get a chance to pick that up, you might want to pick it up during the break that

immediately follows my introduction. And that way you can have the notice in front of you in case it bears on any of the comments that you might like to make.

Next slide, please. To better focus the discussion, we have tried to break the questions into four groups. And what we would like to do is to move from the more general to the more specific questions.

Now, already this morning we have had a lot of interest in what comes up as our very last question. The numbers that you see here correspond to the numbers of the questions in the Federal Register notice if you would like to follow back and forth. We will put the text of the questions up here as well. So you don't need to be looking at your Federal Register notice.

Already we have had a lot of interest in this. All the way on the right-hand side, question 7 related to Greater-Than-Class-C. So I think it will be Bret's job to pace the conversation today so that we make sure we get to this very last question.

Next slide, please. The first set of more general questions that we would like to talk about are the provisions for averaging itself, which, of course, as Maurice pointed out, is in the regulation, and the guidance document for implementing that provision, the

Branch Technical Position.

So we would like to start off by asking about intruder protection and concentration averaging and other programs; for example, EPA programs for hazardous waste or DOE programs for waste disposal, how the intruder is looked at in those programs and when looking at the intruder, how concentration averaging if there are provision for concentration averaging in those programs, how that is handled to give a little context to NRC's program and concentration averaging.

Then we would like to move on to talking specifically about the site-specific intruder analysis. If we put more emphasis on the site-specific intruder analysis and that requirement will be part, we anticipate it will be part, of the unique waste streams rulemaking that is coming up as a requirement to do a site-specific intruder analysis, if we do that, do we need a Branch Technical Position, so looking at this from, again, a very high level at this point?

If we are putting all of the emphasis on a site-specific analysis, do we need the specific implementing guidance that is in the Branch Technical Position or in a revised Branch Technical Position.

Next slide, please. As I mentioned, we are going to have the text of these questions up on the screen as we go through each part of the discussion. So you will see this again.

Next slide, please. The next questions, we would like to focus on the intruder analyses. And we would like to start by asking in NRC's NUREG-1854. And that is our staff guidance. I couldn't fit the whole title up here. So forgive me for just using the number, but it is our staff guidance for reviewing DOE waste determinations. And that document contains some specific guidance on intruder analyses. And it contained a somewhat new approach to waste classifications that accounted for more site-specific factors.

So waste classifications typically are done with the averaging provisions that come from the part 61 EIS. There is a very static scenario where there is a certain excavation volume of waste. And that bears on the -- that is where the concentrations and the tables came from. And that is where the averaging provisions have their origin.

Now, in this NUREG, we developed a method for waste classification specifically -- again, this only related to DOE waste determinations -- for taking

into account more site-specific factors, the depth of waste, waste barriers to intrusion.

And our Advisory Committee for Nuclear Waste and Materials, which, of course, now is part of our, rejoined to our, Advisory Committee on Reactor Safeguards, ACRS, they endorsed this view, this new waste classification, and encouraged us to look at applying it to other programs. So one of the things we want to ask here is if those methods could be applied more broadly to low-level waste.

Staying with the intruder analyses, we want to ask if there needs to be specific guidance on the interpretation of intruder dose given waste heterogeneity. And the question here really in my mind is, how unlucky is the inadvertent intruder? Does the inadvertent intruder hit the average waste in a trench? Does the inadvertent intruder hit the hottest containers in the trench? Does the intruder hit something in the middle? And how should that be interpreted?

And since we are putting more emphasis now on the site-specific intruder analysis, we want to ask, should there be specific guidance to looking at the waste heterogeneity in terms of the intruder?

This question is very related to the next

question, where I talk about limits to average.

So if we could have the next slide? Again the specific questions.

Next slide. The first question that we want to talk about in our group related to limits to mathematical averaging is the volume of waste that we should consider for averaging.

In the Branch Technical Position, as it stands today, it discusses averaging over a waste container. And others have questioned whether we should average over a whole trench, whether we should attempt to average over the amount of waste an intruder could exhume, and there may be other alternatives. So we want to ask the benefits and drawbacks of these various approaches for our revision to the BTP.

Now, in this group of limits to averaging, what we are really asking again -- and everyone here is familiar with this, but I always feel compelled to point out the difference here. When I say averaging, of course, what we mean is mathematical averaging.

You throw some waste in a container. I'm sorry. You place carefully some wastes in a container.

(Laughter.)

DR. RIDGE: I know that is going to show up in the newspaper, NRC talking about throwing waste.

And you can mathematically average their concentrations. And, as Maurice has discussed, that is provided for in the guidance. And that is distinct from blending, where we are actually talking about physically mixing the waste.

So first in this first group, I want to talk about, limits to averaging, what volume can you average over the factors of 10 and 1.5?

The Commission endorsed our option 2 in our SECY paper on blending. And that is going to eliminate the factor of 10 for homogeneous wastes. However, there is still a factor of 10 similarly worded. You cannot average these concentrations if the most concentrated component is more than a factor of 10 away or if any of the components, rather, are more than a factor of 10 away from the average of the mixture.

The factors of 10 and 1.5 or discrete waste, again, 10 pertaining to non-primary gamma emitters and 1.5 pertaining to primary gamma emitters, those still stand at the moment. And so the question is, should those still stand for discrete wastes?

And then most specifically within this

group, John mentioned that you would see the limit for cesium-137, the 30 curies and .2 cubic meters limit come up again. And the question here is that that limit is much more restrictive than the 4,600 curies per cubic meter restriction in the waste classification tables. So the question is, should we somehow harmonize that? And should we keep this more restrictive limit in the revised BTP?

Next slide, please. Next slide. And, finally, we want to talk about limits to blending of waste. One specific question is, should we allow for blending of sealed sources and cartridge filters into something that would become homogeneous waste? Of course, sealed sources not starting out as homogeneous waste, but if we allowed blending to make them into homogeneous waste, should we do that?

And, then, finally, the question that we have received already a lot of attention for this morning, the Commission gave us very specific direction that we should not allow Greater-Than-Class-C waste to be blended into something that would be Greater-Than-Class-C waste.

And the Commission's thinking there that they laid out for us in the staff requirements referendum is that Greater-Than-Class-C waste is a

federal responsibility. And we should not blend it to be something less than that because that would make it a state responsibility. And we shouldn't cross that line.

That direction was very clear. But the question, then, is, do we need some more guidance and what would be in that guidance on how to implement that? It seems straightforward enough. You have Greater-Than-Class-C waste. Don't blend it.

But as Diane already addressed this morning, there is the question of timing. For example, there may be other specific questions, but there is the question of timing as to when this waste becomes Greater-Than-Class-C.

If you have something with Greater-Than-Class-C concentration, could it be blended at that point because it isn't Greater-Than-Class-C waste until it is shipped for disposal, not for processing?

And so in the Branch Technical Position, should we address that issue? And are there other issues that we should address? Is there other specific guidance that we need related to this Greater-Than-Class-C question?

So that is the questions in a nutshell.

As I mentioned, we are going to use these slides as a road map. And the specific text will be up there for you to refer to during the discussion. And we look forward to your comments. As Larry pointed out, we think we are going to get a lot out of this this morning.

Thank you.

CO-FACILITATOR LESLIE: Thanks. Thanks, Christianne and John.

At this point again I am going to look to the panel to see if anyone has clarification questions for the material that either John or Christianne described in terms of how we will go through the material today? Lisa?

MS. EDWARDS: John, on slide 2 of your presentation -- and, Christianne, I think you more or less referred to this during your set of slides as well -- you make a point that the BTP was issued to ensure the protection of the inadvertent human truder.

And my question is, if a waste package is placed in a disposal environment that equates to class B or C disposal; in other words, stability is provided, perhaps engineered barriers are provided that would alert someone digging in the site that they have encountered, a non-natural barrier?

If waste is placed in that type of environment, how applicable is the inadvertent intruder in your opinion from the Branch Technical Position's standpoint?

DR. COCHRAN: Actually, it sounds like a good question for discussion later, rather than a clarification. Is that okay?

MS. EDWARDS: Absolutely.

DR. COCHRAN: Okay.

CO-FACILITATOR LESLIE: Okay. Any other clarifying questions from around the table? We are doing good so far, which is great because I know once we get into the discussions, we will be spending more time. At this point in the agenda, we are supposed to break. Oh, sorry. John?

MR. LePERE: John, if I could, you made a point when you were talking about mixing of dissimilar waste streams. And you said if you were going to mix dissimilar waste streams, then you need to classify based on the highest individual component. And the question I want to ask here is if you are mixing or blending activated metals, where you have already applied a concentration averaging scenario to the batch of metal and then you add the soil for purposes of meeting container fill criteria.

Are you saying that you need to apply this to the most restrictive individual piece of that activated metal or the classification of the concentration average batch of activated metal?

DR. COCHRAN: My understanding is that you would not do a two-step averaging.

MR. LePERE: Understand. I am not suggesting that you again average the material over the soil, but if you have determined the classification for that container based on a concentration averaging scenario for the activated metals in that container and then you put lower-activity metals, you are not going to re-average. But you are going to characterize based on the class of the averaged activated mental, as opposed to a single individual component.

DR. COCHRAN: It sounds like a two-step to me, though, in that -- and maybe I don't understand the question properly, but to me if you had a container with waste in it or you were thinking of having a container with waste in it, you would constitute or create that container and then apply the rule. You wouldn't partially create a container waste, apply a rule, and then say, "Oh, I want to add some more. What is the next rule?" Am I

misunderstanding or --

MR. LePERE: Well, let me give you a scenario. I have a batch of activated metal, various pieces and parts of activated metal. And I apply a concentration averaging scenario to that activated metal. And I determine that that activated metal is class B or class C waste. I've got some class A soil. Now, I have to meet some certain fill criteria for the container, 85 percent, 90 percent, whatever the case may be.

For purposes of efficiency, I am going to place that lower-activity material in the same container, but classification is driven strictly by the activated metal.

DR. COCHRAN: Yes.

MR. LePERE: And you do a count, obviously, for the activity of the lower-activity metal in the overall scheme of things. But the classification is based on the activated metal.

DR. COCHRAN: Yes.

MR. LePERE: The reason I wanted to make that distinction, it sounded like you said you have to base it on the highest individual piece. And that's different than the classification that you achieved as a matter of concentration averaging the total

inventory of activated metal.

DR. COCHRAN: No. My understanding is it would be based on the highest piece. So let's say I've got ten pieces of activated metal going in a drum -- okay? -- and some soil for foil, contaminated soil. My understanding is that you would classify it based on the individual component -- so you've got ten plus soil -- the individual component that has the highest classification.

MR. LePERE: I'm sorry. I guess the point I am trying to make is the individual component is not necessarily an individual piece.

DR. COCHRAN: It is an individual piece.

MR. LePERE: Two different animals.

DR. COCHRAN: Okay.

MR. LePERE: Okay. I guess I'm missing the -- the component for purposes of classification is the final averaged activity of all of the individual pieces of metal. That is the highest or that is the classification-driving component for that container.

DR. COCHRAN: My understanding is you would look at all ten pieces and not the average of the ten.

CO-FACILITATOR LESLIE: Okay. So this obviously looks like one of the points of discussion

that will follow up when we get into the individual topics. Again, I thank the panelists for raising some issues early on. It gives the staff a little more time to think of, is it clear in their minds in terms of understanding your questions so that they can better incorporate your thoughts as they go about their jobs taking all of this information and working on the BTP after this meeting?

At this point we are a little early but not too bad. We are supposed to have a ten-minute break. And so I have about 9:45. And we'll come back around 9:55. And then we'll start our discussion at that point in time. And so for now we are adjourned for a break. And we will see you back in about ten minutes.

(Whereupon, the foregoing matter went off the record at 9:43 a.m. and went back on the record at 9:56 a.m.)

CO-FACILITATOR LESLIE: Well, welcome from your break. I am sure you have a lot more energy and ready to launch into the questions you have already had.

I kind of want to let people know we really intend to follow how Christianne laid it out: John's question and Lisa's question. We are going to

try to address that later this morning and then kind of Diane and -- I forget -- it was Dave, David James, on parts greater than class C. We are going to get that later today.

So, again, we are going to try to keep this flow. I am very mindful that we have had some really good comments and questions so far. And I think that when we get there, the NRC will be anxious to hear more and provide some insights.

So, as Christianne laid out, we have four really discussion areas that we need to get through in three discussion periods. So I want to start, as Christianne laid out, on the averaging provisions, remind you that there were two questions in the Federal Register notice that we will talk about.

And if I could get the next slide? These questions will be projected. And these are on the averaging provisions.

And so at this point I am just going to kind of open it up. I will remind the people on the panel that you can turn your tent this way or vertical, whichever way you think will get my attention first.

Is there someone at the panel that wants to talk about either question 9 or 3 at this point or

is everything clear and you can live with exactly what is in the BTP, they don't need to many any changes? Lisa, I will start with you. And I think I will be going to Graham next.

VII. START DISCUSSION OF QUESTIONS

MS. EDWARDS: If it is all right, I would comment on question 3 first.

CO-FACILITATOR LESLIE: Sure.

MS. EDWARDS: Is that all right?

CO-FACILITATOR LESLIE: That's fine.

MS. EDWARDS: From a policy perspective, the Nuclear Energy Institute would like to reinforce -- it kind of goes without saying that we were supportive of pursuing policy changes that continue to protect the health and safety of the public.

Within that concept, when you ask the question if whether the Branch Technical Position is necessary or not, our view is that the revision of the Branch Technical Position is part of a larger process that is happening, which includes the unique waste stream rulemaking and ultimately the proposed revision or potential revision to part 61.

And I think maybe the final answer is perhaps the Branch Technical Position would not be needed in the long run, but if you view it in part of

that whole process, revision of it now as a piece of interim guidance until the ultimate rulemakings are completed, which may subsume the Branch Technical Position later in that process, then we think a revision right now would be good but maybe more in line with interim guidance knowing that ultimately it would probably go away based upon the final rulemaking.

CO-FACILITATOR LESLIE: So I guess kind of what you are trying to get at is, how does this fit into the overall scheme of things? And are they considering that as they go forward, that this might not be needed the whole time --

MS. EDWARDS: Right.

CO-FACILITATOR LESLIE: -- eventually?

MS. EDWARDS: Right.

CO-FACILITATOR LESLIE: I don't know if the NRC wants to address that or we'll just continue on with the discussion. Graham?

MR. JOHNSON: Okay. I had similar thoughts as Lisa in that I envision the NRC tackling the rulemaking process. And I envision that being a long-term process. And I think that the industry could benefit with some updated guidance in the interim to allow us to continue safely disclosing of

waste while the NRC staff is working on the rulemaking.

CO-FACILITATOR LESLIE: And, Marty, you wanted to say something?

MR. LETOURNEAU: Actually, I was going to change the subject. So if there are others that want to comment on this thread, I would say go ahead and continue on that. I wanted to comment on question 9.

CO-FACILITATOR LESLIE: I think the NRC wants to --

MR. KENNEDY: Lisa, Graham, when you say "rulemaking," I assume you mean the longer-term comprehensive revisions to part 61 and only that rulemaking. Is that right?

MR. JOHNSON: That's correct for me.

MS. EDWARDS: Although I think that the unique waste stream rulemaking might play a role in this process if you introduced requirements for the site-specific intruder analysis and site-specific performance assessment.

The decisions and what actually get written down in the rule may have bearing on what is contained in the Branch Technical Position.

CO-FACILITATOR LESLIE: Marty? Actually, Larry?

MR. CAMPER: I mean, Lisa, you are right. Obviously, as the rule would be developed, if something comes out of that language, it would necessitate further guidance. And obviously the regulator would go back and do that.

But I do think it is important to kind of look at where we are on this topic. I mean, for example, right now the staff has two charges before it right now. One is to develop the unique waste streams rulemaking.

The Commission added blending to it. That is going to require a site-specific performance assessment. It is going to identify a number of technical parameters that have to be evaluated, such as period of performance, for example. And there is some associated guidance.

Then there is the charge currently to risk-inform the waste classification scheme at 61.55. That was part 2 of the SRM that came out of 08-0147 SECY.

What is going to happen on part 61 we have no idea. I mean, what we proposed to the Commission was five options. We recommended that we would get stakeholder input, come back to the Commission in a year with a recommendation.

We have no reaction from the Commission at this point about the staff's recommendation. We assume that they will find that approach favorable because it affords them an opportunity for maximum stakeholder input, but we're waiting for any direction that might provide to us.

So my point is this question of blending and capturing guidance at this moment in time or this point in time in this document update is now, and it's important.

And one of the things that I would ask you to think about when you think about blending -- and there is this question of we're charging with defining some homogeneity criteria, homogeneity criteria for blended material. Yet, you must juxtapose that against the regulatory provision that says concentration averaging is allowable.

And so there is a synergism, if you will, or certainly a relationship between homogeneity and concentration averaging. We need to define that or describe it more clearly in the BTP. So this is an opportunity now to do that. We can always refine later.

MS. EDWARDS: Larry, I agree with the points that you just made. I guess my comments were

centered more on the concept of for where we are right now adjusting the BTP or revising it to add clarification, improved useability I think is appropriate, but we would place emphasis that it's part of a larger scheme because currently the Branch Technical Position uses, for lack of a better term, non-site-specific scenarios to derive limits on concentration averaging and the rules basically within the BTP. So they're not site-specific.

And, as we proceed down the pathway, if in the unique waste stream rulemaking and/or possibly when part 61 is revised, if site-specific analysis and scenarios are required, then you I think hopefully obviate the need for kind of these generic non-site-specific because different limits may be appropriate in those scenarios than what would be envisioned by the non-specific scenarios currently assumed by the Branch Technical Position.

MR. CAMPER: Well, could be. I mean, obviously we have the classification system that we have today. This guidance in this BTP is designed to help implement how you actually manage those classifications the way it is you prepare for disposal.

The unique waste streams, unique waste

streams, what that means is these were waste streams that were not analyzed at the time part 61 was created. The target of that rule now is those wastes.

Now, along the way might that be broadened where it addressed all radionuclides, not just those waste streams that were evaluated at the time part 61? I don't know. We'll see how that goes in the public comment period. But I can only say that at the moment what the charges are and what the realities are that we're dealing with.

But you're right. I mean, we will have to see how that rule goes. And we may have to do this again at some point, yes.

CO-FACILITATOR LESLIE: Okay. I would like to go to Marty.

MR. LETOURNEAU: I wanted to reflect on question 9, especially the second bullet there, "Do they allow averaging? If so, what are the constraints?" I think we are talking largely about DOE there.

And, you know, we have a benefit in that we don't have a class A, B, C classification system for our low-level waste. Our biggest concern is make sure that it's not high-level, make sure it's not true, and everything else is low-level. And then what

we are looking to is the site-specific waste acceptance criteria based on a site-specific performance assessment.

I guess the one thing that I would stress there is that very often it is not the protection of the intruder that will drive those limits, but it is one of the other performance objectives, such as the groundwater pathway or the air pathway, that will determine what those limits are.

But once we have identified those limits and we are talking on a radionuclide-by-radionuclide basis for every radionuclide that is in the waste, we can back that back from the waste acceptance criteria to limits that can be applied to any size of a container.

And it doesn't matter at that point what goes in the container as long as you have adequately characterized it and you understand and can account for what is going into that container in terms of its radionuclide content and concentration so that you can then compare it against your waste acceptance criteria.

From that standpoint, we don't worry about where the waste came from necessarily before it goes into a container. The opposite of blending, as I like

to say, is segregation. And there is no requirement to segregate your waste. There is the requirement to ensure that when you dispose of it, you are going to be protective of human health and the environment. So that is what those waste acceptance criteria allow us to do based on the site-specific performance assessment.

We have situations where you may have different types of waste coming out of a specific facility. Maybe you've got job control waste and you've got HEPA filters. There's nothing that says that you can't put those in the same container. But when you put them in the same container, you have to know what the total radionuclide content is, what the concentrations are, and how that compares to your site-specific waste acceptance criteria.

CO-FACILITATOR LESLIE: Earl?

MR. FORDHAM: I've got to tag in on Marty on some of this, too, because some of the same principles apply that we also look to controlling the waste acceptance criteria that is part of our license conditions that incorporate a lot of what the BTP says already. In fact, that is one of the comments we would have, is that if you come up with an actual document for the industry to use, if you can come up

with suggested license conditions, we would love to see those, too.

As far as actually it being necessary, I am still on the fence there because in some regards, you know, some of the initial work that the BTP and the concentration averaging BTP did was to satisfy a few of the sites that we didn't have EISes to back them up for operation with the Hanford site starting operations in '65.

We didn't really see, do an EIS until we completed it in 2004. So, really, we were looking at the site thing, but now that we have a site-specific EIS in hand, we now balance everything against it. We have incorporated the BTP where we can and the conditions.

And now when somebody comes in -- and we'll get to it a little bit later, but the cesium idea is not foreign to us, as you can also already know. Radium we specifically petitioned that it not be included in the Energy Policy Act of '05 because of the processing that we do on behalf of the CRCPD for its disposal.

So in regards to that part of it, we looked very interestedly in looking at using waste acceptance criteria up front to manage the risk and

then also using the conservative scenarios that we have. We use a residential scenario, even though we are right in the middle of Hanford. In fact, in the year 2063, I am going to hand Marty, his kids, the keys to Hanford's disposal site, you know.

And so it is interesting the best that I think that idea will ever come out of that site will be an industrial scenario. We are going to a much more conservative scenario in that regard.

CO-FACILITATOR LESLIE: John?

DR. COCHRAN: I wanted to clarify some of what Marty had said. So for the DOE facility, you are going to do a site-specific PA. And that is going to assume a homogeneous source term. You will develop a waste acceptance criteria. Then that criteria is applied per package. Is that correct? So you don't look inside the package?

MR. LETOURNEAU: Yes. We could do it either way. And depending on the site and depending on the processes that the waste is coming from, it may be looked at on a per-package basis. All I am saying is that it can be done that way.

CO-FACILITATOR LESLIE: Anyone else?

MS. EDWARDS: Just a follow-up question. So although in some instances you may look at it on a

per-package basis, in other cases you may consider a large volume than per-package, perhaps even the whole disposal site?

MR. LETOURNEAU: Every package is going to have to meet the waste acceptance criteria in its own right. But then across the whole facility, we have to look at are we considering the whole facility homogeneous? Are we looking at specific locations of specific hotter items?

It gets back to the question that Christianne was raising. You know, how unlucky is the intruder? And we do struggle with that.

MS. EDWARDS: So per John's question, you know, presumably 100 percent of the waste that goes into a disposal site is not homogeneous, that given some of the complexity of your sites, you may have some helo volumes or certain things that are hotter than other things.

MR. LETOURNEAU: Let me give you another example. Every package is not going to be at the WAC limits. So for the whole facility, we do keep a WAC budget where we are looking at the overall source term budget that is coming into the facility. Then there may be a specific package that comes along that exceeds our waste acceptance criteria, but we are able

to then look at that on a case-by-case basis and see whether for the total for the whole facility we can still accept it. And then for that specific piece, we would focus in on the specific intruder implications for that piece and could it be accepted on that basis.

So the waste acceptance criteria provides you flexibility in both looking at a per-package basis and really having sort of an action level, if you will, for having to trigger what we call a special analysis, which is an additional look at the performance assessment and the intruder scenario for that specific package that otherwise would exceed the waste acceptance limits.

CO-FACILITATOR LESLIE: Christianne?

DR. RIDGE: Marty? Oh, I'm sorry.

CO-FACILITATOR LESLIE: It's all right.

DR. RIDGE: I just wanted to ask Marty to clarify something.

CO-FACILITATOR LESLIE: Sure.

DR. RIDGE: So if you have a container that comes in that exceeds the WAC, then would you assume that an intruder hits it? When you were looking at a special analysis on a case-by-case basis look, if you could accept that container, would you assume that an intruder hits it or assume that there

is some chance that an intruder hits it? How do you address that?

MR. LETOURNEAU: Yes. We would look at it both in the context of the original intruder scenario that was developed for the facility and then also look at are there any special handling requirements that would change that analysis? That would all be part of doing the special analysis to look at whether there would be any particular new criteria that you would need to look at.

And if it's a case of an activated metal, obviously that is going to be different than contaminated soil with high concentrations of cesium. So we would account for those differences in the special analysis.

We may also look at where it would go in the facility, if it would go in the center, in the bottom of the facility. Does that change it? Certainly the amount of soil that would be brought up under a traditional scenario, say a drilling scenario, would be accounted for. All of that case-specific information would be part of the consideration.

Now, the other thing to keep in mind is that the waste acceptance criteria are set based on the performance assessment, but they are not set at

the limits of what the performance assessment shows can go in the facility. There is some fraction of what the PA shows for defense-in-depth. So, you know, there is flexibility there in how you use those numbers.

CO-FACILITATOR LESLIE: Okay. Before I go to John and then Lisa, kind of a reminder. You have a facilitator who doesn't know all of your acronyms, which means probably some of the people in the audience, maybe the people on the phone, don't understand your acronyms.

I think WAC means waste acceptance criteria. So just kind of a gentle reminder that if you are going to start introducing acronyms, just explain them. Thanks.

John?

MR. LePERE: Yes. Marty, if I could, I just want to clarify something for myself. So if you have a particular package of a container that may exceed the waste acceptance criteria at the facility, you can still do an analysis and perhaps -- and I may be reading words into this -- apply some additional institutional controls to make that acceptable for disposal?

MR. LETOURNEAU: Yes, that's a

possibility, absolutely.

MR. LePERE: Like trench depth or --

MR. LETOURNEAU: Exactly.

MR. LePERE: -- culverts or things of that nature?

MR. LETOURNEAU: Right.

MR. LePERE: Okay.

CO-FACILITATOR LESLIE: Lisa, do you still have a comment?

MS. EDWARDS: No. That was my same question that John asked.

CO-FACILITATOR LESLIE: Okay. I am going to actually turn to the NRC staff for a second to kind of contemplate what they heard. Jim, it looks like you have got something to say.

I actually have to change batteries. So I will be trying to watch you out of the corner of my eye and see if anyone else turns up their tent.

MR. KENNEDY: Just help me with this a second, Marty. You were using the terms "performance assessment" and "intruder analysis." And I think you may have been using them in two different senses, "performance assessment" being an off-site person -- at least that's the sense that we use it -- and "intruder assessment" being an intruder that comes

onto the site and gets into the disposal package.

But for the intruder assessment and for the WAC, in particular, do you have concentrations that are specified similar to the concentrations that make up our waste classes A, B, and C? Are they part of the WAC? And, therefore, you do average the concentrations based on the analysis that you do for the intruder?

MR. LETOURNEAU: Yes. First of all, our performance assessment includes both the freight and transport to a point of assessment 100 meters from the edge of the facility for the pathways. We look at all pathways: water, air. We have a separate standard for radon.

But our performance assessment inherently includes with it the intruder scenario because depending on the site conditions, it may be one of those other performance objectives or the intruder scenario that dictates what the concentration limit is going to be for a particular radionuclide. Of course, we do use some fractions.

But then, yes, we develop a particular limit for the facility, which does assume averaging across the facility. But then, as I said, you have the flexibility to look at specific packages that

would otherwise exceed that, if you will, generic limit or average limit.

CO-FACILITATOR LESLIE: Okay. I am going to go to Mark first and then John LePere and then John Cochran.

MR. LEWIS: Very good. The discussion we are having right here with the DOE and Marty's discussion here on the fact that DOE really doesn't have a waste classification system and they use more intruder scenario and performance assessments obviously goes back to one of Lisa's original comments in the fact that 10 CFR 61 revision that may be a number of years down the road may conclude that there isn't going to be a table 1, table 2, class A, B, and C for commercial waste as well, in which case then the revisions to the BTP right now are really just an interim step.

And maybe the time that you spend making revisions to it needs to be minimized and discuss, only cover those items that in the interim period of time need to only address waste issues with the whole idea that down the road when you do a revision of 61, waste classification is going to go away and you are going to do all of your assessments on how you dispose of your waste on a performance base and risk-informed

and intruder scenario analysis.

CO-FACILITATOR LESLIE: John?

DR. COCHRAN: Two things. One, just to respond to Mark, I think, even to go to a site-specific basis, the NRC is probably going to have to provide guidance or bounds for the site-specific PA for the intruder. And I assume DOE does that.

And then I had a question sort of bringing something that Christianne had said together with what Marty had said. Christianne was asking, well, how unlucky is our intruder?

And Marty I know some years ago in Nevada Test Site had worked on doing an expert elicitation on probability of human intrusion attempting to answer the question, at least for Nevada, how unlucky is our introducer? Did that elicitation on probability of human intrusion go forward? And is it used?

MR. LETOURNEAU: DOE order 435.1 does allow consideration of probability of intrusion in doing that calculation. And up until the example that you cited, John, none of our DOE sites had tried to do that.

And yes, in fact, they did the expert elicitation. And they are using that in their intruder scenario, if you will. And their conclusion

based on a number of reasons, including land withdrawal and the land use policies that they have put in place, is that the probability of intrusion is qualitatively low.

CO-FACILITATOR LESLIE: Diane?

MS. D'ARRIGO: Could you elaborate a little more on that? What are the land use restrictions that make the probability low? Like right now I think 10 CFR 61 is 100 years.

MR. LETOURNEAU: Right. In our case, when we're talking about -- and it's no longer the Nevada Test Site. It's the Nevada Nuclear Security Site. Is that right, NNSS? They have changed their name. Abbie can help me.

MS. CUTHBERTSON: Yes. I think it's Nevada National Security Site.

MR. LETOURNEAU: Yes. One of the important things about understanding that site is understanding that it is surrounded on all sites by Nellis Air Force Base. So before you can get to the site, you have to get through the Air Force base, understanding what the local resource conditions are and the reason why there is nothing out there.

We had not in the past formally withdrawn that land. And BLM asked us to do a formal

withdrawal. So this land has been formally withdrawn. And all of that is part of what is leading into the future use expectations for the site, is the limited accessibility, the fact that it has been withdrawn, the fact that the federal government has said, yes, we will be here for essentially ever.

It can be debated, as always, when we talk about future use and institutional controls, but these are positive steps that have been taken that are different than some of our other sites and different than the commercial licensing assumptions.

MS. D'ARRIGO: So that is just for the NNSS, the former Nevada Test Site?

MR. LETOURNEAU: Yes.

MS. D'ARRIGO: But DOE's policy on this, then, would that also apply to other sites? Other sites have disposal for themselves.

MR. LETOURNEAU: Other sites would have the ability to look at their particular situations and see whether those types of conditions exist at their site. Very few have at this point. Obviously something like WIPP has been formally land-withdrawn.

But the Nevada Test Site, NNSS, took it upon themselves to take this step. And they were the first ones in the Department to go that far in looking

at what their future use would be and what their land status was and all of that.

MS. D'ARRIGO: So I guess I am just trying to be specific about what. Are you talking about you have changed 435.1 or you have just specifically done something for NNSS?

MR. LETOURNEAU: No. We didn't change anything in 435.1. We have always had the language in there that said probability of intrusion could be considered. And we always had the language in there that said future land use could be considered in determining future compliance.

But they are the first ones to go to that length of exploring that and doing the expert elicitation and looking at all of their conditions and developing their own site-specific control policy and future land use assumptions along those lines. So it is in 435.1 now.

MS. D'ARRIGO: So that is maybe the kind of thing that NRC would consider when they are updating 10 CFR 61 to instead of having A, B, C wastes, that they would have some other kind of criteria that would be site-specific performance assessment. Is that what is being advocated?

CO-FACILITATOR LESLIE: Okay. I don't

know if it is advocated. I think Marty is just trying to explain what has been going on at DOE's facility.

And, again, the purpose of this talk today -- and Larry has laid the framework and I will try to reiterate we are trying to focus just on the BTP. There will be other opportunities. He has that slide. That might be a consideration when they revise part 61, but we are not going to really focus on that today.

MS. D'ARRIGO: Well, I was just trying to see if that is what -- a similar kind of thing that is being suggested by the folks that we are talking about doing away with ABC and having there be performance assessment criteria. So that would be one way of maybe doing it. Is that what we're considering, understanding the concept?

CO-FACILITATOR LESLIE: Sure.

MS. D'ARRIGO: I am not trying to --

CO-FACILITATOR LESLIE: All right. No. Christianne and then Lisa?

DR. RIDGE: Thank you.

I just wanted to clarify something that I had said and ask Marty a follow-up question. When I asked about how unlucky the intruder is in respect to the Federal Register notice question, what the Federal

Register notice question is really focused on is what do we assume that the intruder hits?

We look at the intruder. We look at protection of an intruder by assuming that there is an intruder at the site. So it's a little different from the question that we have just discussed regarding the probability of intrusion.

We are looking at the probability of intrusion. In the current framework, we are looking at the probability of intrusion as one. Intruder comes to the site and intrudes on the waste. And that is how we are protecting the intruders, by assuming that there is an intrusion.

And then when I was paraphrasing the Federal Register notice question with respect to how unlucky is the intruder, that was a question about, what do we assume the intruder hits? Do we assume that the intruder hits the average waste? Do we assume that the intruder hits more concentrated than average waste?

And so it is a valuable discussion, but I did just want to make that distinction because it grew out of the discussion of the Federal Register notice question, that those are two slightly different things.

And the follow-up question that I wanted to ask Marty is that once you have come to that assessment that the probability of intrusion is subjectively low, what happens then? It is subjectively low? And then does that change what criteria are applied?

MR. LETOURNEAU: It doesn't change the criteria that are applied because we do the same thing. We assume a probability of 100 percent that they are going to intrude and calculate the result accordingly.

Again, the same thing, looking at them hitting higher-activity sources than lower-activity sources, but, really, what that is being used at is part of the overall safety case, if you will, of interpreting and applying this institutional control policy and the future use policy and all of that. So it is not changing the limits.

CO-FACILITATOR LESLIE: Thanks, Marty.

Lisa?

MS. EDWARDS: I want to go back to an earlier comment you made, Marty, and just for my clarification. You talked about the potential of a particular package exceeding the waste acceptance criteria that is specific for a particular DOE site

and that when you looked at whether that package was acceptable or not, you might consider things like the depth of cover for the particular package location.

So I kind of drew from your comment that things like intruder barriers or engineered barriers that would alert the intruder, you could perhaps put cement or something around it that distinguished it in some way or the depth of cover, which would change kind of some of the applicable intruder scenarios.

I just want to be clear. So you could look at that individual package. And the applicability of a particular envisioned intruder scenario for that site might be looked at differently for that package if you put special constraints on how the package was placed in the disposal environment. Is that right?

MR. LETOURNEAU: Right. We typically have not gone to the point of considering all new barrier covers or new intruder deterrents. Typically we're looking at, well, gosh, if I put this on the bottom of the facility, instead of on the top, and rerun the intruder scenario, do I get a different result? And typically if that doesn't work, there's probably not much else that you can do.

MS. EDWARDS: So, Christianne, as a

follow-up to that -- and some of the intruder scenarios we have in the Branch Technical Position and part 61, which the Branch Technical Position draws upon, they really apply right now more or less to class A wastes that don't have the intruder barriers.

And there is an assumption that when you go to class B or C disposal requirements or the equivalent thereof, that the intruder is alerted. So at that point, then, the intruder isn't inadvertent any longer. And those same kind of scenarios are not applied to those disposal environments for B and C waste. Is that your understanding?

DR. RIDGE: My understanding is that the assumption for class B waste is that the waste is still recognizable. Class C waste is evaluated at 500 years, instead of 100 years with respect to how the tables were developed.

So with respect to how the tables were developed, the numbers for class C waste were developed at 500 years. And it is assumed that at 500 years, that waste is not recognizable. So it is not quite the same for B and C, B being evaluated at 100 but recognizable, C being evaluated at 500 but not recognizable.

MS. EDWARDS: Sure. So for C, well, for

always at 500 years, the short-lived is gone. And we are really worried about the carbon-14 and transuranics. But for a lot of the intruder scenarios that we consider in the class A situation for the agriculture and that kind of thing, we say some of those don't really apply when you are looking at the short-lived, the cesium and the cobalts, et cetera, because in the B environment, they would still be recognizable waste forms while they were still present, that the short-liveds would all be gone by the time the waste became unrecognizable. Is that your understanding?

DR. RIDGE: Yes. That's the basis.

MS. EDWARDS: Okay.

DR. RIDGE: And that is why there is no class B for long-lived --

MS. EDWARDS: Sure.

DR. RIDGE: -- waste is that those are evaluated. You know, you have that barrier. So those are evaluated later.

CO-FACILITATOR LESLIE: Yes, David, did you --

MR. JAMES: Yes.

CO-FACILITATOR LESLIE: Okay. And then I will get to John.

MR. JAMES: Lisa already covered most of my thought, but basically with the approaches with the BTP, it is a reinforcement of the limits and the modeling that was done for 10 CFR 61 originally. So in the DOE case, where they're doing individual performance assessment, individual site parameters, individual cover designs, they have a lot more flexibility in how they apply these criteria.

Just looking at the BTP and looking at the disposal practice that is actually occurring in commercial sites, I think we have an argument, let's say, as to the applicability of these averaging criteria at the class A level basically. I think that was the plan.

CO-FACILITATOR LESLIE: Thanks.

John Cochran?

DR. COCHRAN: I'm just going to add to what Christianne had said. The scenarios in the EIS are the same, whether it's A or C. It's just that in A, you assume the intrusion occurs as soon as you lose active control at 100 years. The B and C waste requires additionally the depth of burial or intruder barriers such that the waste is going to be recognizable to 500. Then at 500, those are assumed to be lost. But you still apply the same scenarios,

but they occur at 500 now.

MS. EDWARDS: And source terms do that.

DR. COCHRAN: Yes. Now, I would also say that in general, the short-lived are gone at 500 but not necessarily with sealed sources. And one of the things that we did in reworking, trying to make the BTP easier to read is we redid the calculations that are in the back for the intruder scenario for encapsulation.

We found that if you start with 30 curies of cesium, a 30-curie source, decay it for 500, and then put it one meter from a person for 2,000 hours, the dose is still quite unacceptable, even though it was cesium and it was only 30 curies.

Now, if you are familiar with the analysis in the BTP, that assumes 2,360 hours of exposure at one meter, the point being that cesium in highly concentrated packages, short-lived, does not necessarily decay to benign levels, even in 500 years.

CO-FACILITATOR LESLIE: Okay. I think I am going to go to Christianne for clarification and then to David James.

DR. RIDGE: John's really an expert on this. And so I don't like to clarify that what I am saying is different from what John is saying. But,

actually -- and maybe John and I need to discuss this offline. And I'm sorry that we are not in synch on this.

What I had said was that the scenario for class C waste is the same as A because after 500 years, it is assumed to be unrecognizable. The scenario for class B waste is evaluated 100 years and is assumed to be recognizable and is a different scenario. Okay. So we are now in agreement. Okay. So just to be clear --

CO-FACILITATOR LESLIE: We are in agreement.

DR. RIDGE: Okay. So yes, the scenarios for A and C are the same, the scenario for B different because it is assumed to be recognizable. And it happens at 100 years.

I don't know if I have now made things more confusing, but it sounded to me like John was saying that the scenario for B and C was the same. And B is a little different is all I was trying to say.

CO-FACILITATOR LESLIE: And this is an advantage of having the meeting transcribed and having your public comment period well after the date of the meeting. So we will think further clarification, but

I think you will be able to follow the thread in the transcript.

DR. COCHRAN: Just a quick follow-up. I'm sorry.

CO-FACILITATOR LESLIE: Go ahead.

DR. COCHRAN: We do agree. If I said B and C, it was a mistake.

CO-FACILITATOR LESLIE: Okay.

DR. COCHRAN: So A and C are the same. It is just a matter of when it occurs. B is different. So if I said something different, I'm sorry. We are in full agreement.

DR. RIDGE: We're all in agreement now.

CO-FACILITATOR LESLIE: Okay. Then David and then I will go to Diane.

MR. JAMES: I think there always is a difference between A and C because you have additional depth with the C. But the point I was going to make is if you take the sources, the sealed sources, out of the discussion and say, "We will treat them as a special waste form" or something that is a little bit out of the ordinary, how would it all apply to the rest of it?

Because when you look out to that 500 years, you have got your protection covered. If you

don't have a sealed source in the mix, you don't have that worry. And right now the disposal sites treat sealed sources differently than they treat normal waste anyway.

Barnwell had encapsulation rules. Clive doesn't allow them. I don't know if Hanford does. I don't think so. But they are treated special in the disposal site. There are special disposal requirements, special declaration requirements. And I think that that assessment goes on, even if it's not specifically called out in the regulations, beyond 10 CFR 61 that, you know the handling of sealed sources in the original regulation, in the original classification criteria kind of left a blank there, which, you know the BTP then tried to fill in. But in doing so, it over-reached I think into a lot of other categories that don't really fit the comments.

CO-FACILITATOR LESLIE: Diane? And then John Cochran I think. Well, never mind, then. Diane?

MS. D'ARRIGO: I wanted -- if it's easy to just spiel out what the A, B, C distinctions are, I would appreciate that. I have a recollection of something being 300 in there. So it's 100 for A. It's 500 for C. And what is it? It's 100? Can you summarize that for me?

DR. COCHRAN: I'm happy to if you want. It's complicated. And I am going to oversimplify it. Okay? So here is an oversimplification. A waste is such that if intrusion occurred at 100 years, as described in the part 61 EIS, A waste is such that the intruder would not receive an unacceptable dose digging into the waste and gardening in the waste at 100 years, as described in the EIS.

C waste would be acceptable for intrusion and gardening as described at 500 years.

B waste would be safe after a few hundred years. So it has to be recognizable at 100.

So the discovery dose -- I've got some photos we could show. But if the intruder dug into the old landfill, he would recognize the waste and, importantly, that it is a hazard to him or her and back away.

MS. D'ARRIGO: At 100?

DR. COCHRAN: At 100. But at a few hundred, the C waste would become acceptable.

MS. D'ARRIGO: B?

DR. COCHRAN: B. I'm getting my A, B, and C's mixed up. And that's --

MS. D'ARRIGO: Okay. So a few hundred.

DR. COCHRAN: Yes.

MS. D'ARRIGO: That's where I got my 300 from. Okay.

DR. COCHRAN: Yes. Three hundred is the minimum life of the intruder barrier for the B.

MS. D'ARRIGO: So after 300 years or a few hundred years, it would no longer be recognizable and it would meet the scenario?

DR. COCHRAN: That's correct. It would be no longer recognizable. And, importantly, the intruder could dig into it and live there and garden there, as envisioned in the EIS, and not receive an unacceptable dose.

MS. D'ARRIGO: Okay.

DR. COCHRAN: I'm sorry if I have mixed my A, B, and C's here.

CO-FACILITATOR LESLIE: All right. Right now there are no tents up. So before we move on to the -- oh, sorry, Earl. It was up for a while and then went down. Sorry. Go ahead.

MR. FORDHAM: Just to kind of help out here as to how unlucky the intruder is kind of idea, just from a practical standpoint, I can tell you that the packages in the trenches at Hanford are a very small percentage of the waste class limits. And we do segregate by waste class.

However, if you are looking at probability of actual intrusion being one and you want to give it some model of what you should be aiming for as far as what they hit, definitely don't use the average for the trench or anything.

You may want to skew it towards hitting one of these packages that are -- and I will give the power plants their credit. They are about the only ones along with brokers that get anywhere close to an actual waste class limit on a package basis.

CO-FACILITATOR LESLIE: Okay. I'm going to -- again, I don't see any more tents up right now. And this was supposed to be one of the easier sections of the meeting. I am going to just turn real quickly to Jim and Christianne to see if they have any further questions or have they basically heard enough to understand the responses of the participants on questions 9 and through of the Federal Register notice? Are you comfortable?

MR. KENNEDY: Well, I would just encourage people to write in comments. They are due April 15th. And elaborate on some of these points. There are some big issues here, and they are complicated.

One thing I am still trying to get my hands around is the difference between doing the

site-specific intruder analysis -- that's one thing. And we talked about that and how the sites have a lot more controls than were envisioned when part 61 was developed and what's considered in the EIS.

At the same time as Larry pointed out we simply have class A, B, and C in the regulations, the tables are there. The requirements have to be met. There may not always be a direct connection to health and safety, like there used to be when part 61 was originally developed.

And so what does one do with that provision there and the need to specify guidance for how averaging is done, even in light of having this unique waste streams rulemaking coming in the next couple of years if that makes any sense?

CO-FACILITATOR LESLIE: Okay. All right. Just a reminder that when you are done talking, to unplug yourself. We had a little bit of feedback a while ago, but I think we are set to go to the next slide.

Okay. All right. Lisa?

MS. EDWARDS: I would like to just ask one more, maybe put a question, maybe put a challenge out to the group. So we have assumed a probability of intrusion of one. And when we look at all of the

intruder scenarios, at least for class A, we start talking about 100 years. And I guess I want to challenge the believability of an accidental intrusion at 100 years.

Some of us live in homes right now that are greater than 100 years old, in some cases several hundred years old. We certainly have, most of us, visited sites that are well over 100 years. And we didn't lose them. We still know where they are all these hundreds of years later. And an inadvertent intruder implies that 100 years from now we somehow forgot that there was a disposal site that is well-marked and delineated.

And if we are going to challenge ourselves to be risk-informed and performance-based, maybe we also need to go back to some of our original assumptions and say, are those reasonable assumptions to impose upon the performance assessment or et cetera?

CO-FACILITATOR LESLIE: Those are the assumptions in the BTP or are those the assumptions in the regulation?

MS. EDWARDS: Well, they are kind of in both places because the Branch Technical Position draws upon those scenarios and the assumptions

contained in those scenarios to define limits on averaging or the implementation of what the rule actually says.

So to risk-inform the Branch Technical Position, I think you have to go back and say, what is the reasonableness of these assumptions?

CO-FACILITATOR LESLIE: Okay. All right. And we are going to move on to the next group of topics, kind of where we are in the agenda. We are supposed to have public comments at 11:15. That gives us a half-hour right now to start talking about intruder analyses. And we are going to be focusing on questions 1 and 8 in the Federal Register notice. And if I could get the next slide, we will have those up for the participants?

And, again, I will just look for a tent to come up. We don't necessarily need to start with 1 or 8. Again, Lisa, you are still up. Well, maybe she is not.

You know, so would the waste determination guidance be an appropriate approach for the BTP as a starting spot or an ending spot? Well, I was just trying to paraphrase what Christianne had said is that, you know, the NRC staff has some guidance out. It is being used. They have gotten feedback from an

advisory committee that said, "You should consider doing it someplace else."

And I guess I was just throwing it out and kind of putting a sharper point on it. So if the staff just implemented those concepts and that approach in this, into the BTP, would that be fine for all of you? Okay. Good.

David?

MR. JAMES: I'll start it. I'm sure there are a lot of people in the room who understand and are familiar with NUREG CR-1854 much more than I am, but in my reading of it, the guidance allowed taking credit for conditions like greater depth obstructions and limited blending with grout material to stabilize material that was trapped in the bottoms of slanted tanks that were buried.

There were some -- I think the basis that was built into it was that you could average over as much grout as you could mix the material with, you know, up to a certain level, but it allowed for downgrading the classification and allowing the abandonment of the tanks in place for in-place disposal.

The rulings that were in there in some of the latitude and flexibility that were provided by

that evaluation analysis if we applied those same sorts of things with our wastes from the nuclear power plants, one, it would kind of obviate the need for the Branch Technical Position itself and give a lot more flexibility than we have been able to take up to this point in time.

Another point with respect to that, too, is that it is a DOE-operated process. So they have within their organization great depths of expertise of people that can take on these kinds of analysis and do the studies that wouldn't typically be part of the organization backing up a commercial site.

And also just at that point, they did individual performance assessments associated with those disposals.

CO-FACILITATOR LESLIE: Thanks, David.

Marty?

MR. LETOURNEAU: Yes. I guess we are definitely the ones that have had the most experience with 1854 other than the NRC staff. So I wanted to clarify what the conundrum was that we were having here.

You know, we are trying to close these tanks and we are trying to use the criteria from the 3116 legislation, which allows us to close these tanks

and declare that they are not high-level waste looking at the residual that is left in the tank, whether we have cleaned out, removed the key radionuclides, the highly radioactive radionuclides to the maximum extent practical, whether we have a solidified form that will not exceed the class C limits, and then meeting the low-level waste performance objectives.

So the real question was, where and how do you determine whether you have exceeded the class C limits or not? Do you look at the residual in the bottom of the tank? Do you try to mix it with a little bit of the grout? Do you average it across the whole volume of the tank?

And ultimately the solution -- and I will let Jim and Christianne talk more to this, but my perspective is ultimately the solution that they looked to was, well, if we look at what is in the tank and we have some minimal mixing with the grout and then we apply an intruder test to it and assume that somebody is drilling down through the tank and through the grout and just down to the bottom of the tank so they have gotten the maximum amount of waste with the minimum amount of material to dilute it. And that is the stuff that comes up to the surface.

What is it then? And what does it mean to

the intruder at that point? And that really is to me the key in those scenarios that are in 1854. It is looking at the intruder, rather than trying to decide at the bottom of the tank or with a certain amount of grout or what have you, whether it is class C or not.

CO-FACILITATOR LESLIE: Earl?

MR. FORDHAM: Marty, let me just clarify it because, you know, being an Hanford, your tanks aren't small.

MR. LETOURNEAU: Right.

MR. FORDHAM: So, you know, your drill rigs are what? You're looking at a two-foot extraction, two-foot cross-section.

MR. LETOURNEAU: Was it eight-inch?

MR. FORDHAM: So it's only an eight-inch extraction?

DR. RIDGE: I don't recall the exact measure, but the idea was that a person was drilling for a resource, probably water. So it wasn't based on necessarily what you would drill into a tank. It was based on if you were going after water, what would a water well look like? So I think it was smaller than two feet certainly.

CO-FACILITATOR LESLIE: Okay. And I guess one of the things -- I would like to turn to

Christianne a little bit more. And, again, this is guidance that has been used for a program that is not commercial low-level waste. And so I am hearing some of the people not being completely familiar with what is in that guidance document. And so, you know, can you describe some of the things in there that are specific to your contemplation in terms of revising the BTP? And perhaps that is going to elicit some more response.

DR. RIDGE: Certainly. I think Marty has done a good job in giving an overview. Essentially what it does is that it allows some consideration of site-specific factors. And essentially I think the way Marty put it -- and I hadn't quite thought of it exactly this way before, but you're applying these classifications more to what is brought up than what is in place.

And the way that that is implemented is by applying a modification to the sum of fractions. And so the concentrations are compared to the table, but there is a modifying factor applied to the contribution to the sum of fractions.

That was done explicitly in recognition of this DOE situation being very different from the commercial low-level waste. And so when it was done

at the time, it was done, I guess, as I already said, in recognition of this being a very different scenario from the low-level waste. And we recognize that departure.

Now, after that was published, the Advisory Committee for Nuclear Waste and Materials advocated us broadening that approach. I don't know if the question is, do I need to explain any more exactly what was applied or what was assumed?

The assumption was in the original environmental impact statement that someone, the limiting scenario was someone, excavating a base of a house. And so there is a much larger volume of waste brought to the surface because the waste is assumed to be shallow.

In the situation we were dealing with with DOE, it wasn't general guidance. It was being applied to specific situations that we were familiar with. We knew that the waste was at a much greater depth. And we knew that it had an intruder barrier in the form of a great deal of grout over it. And so that assumption was in most cases a driller.

Now, there is text. And I shouldn't say it wasn't general because there is text in 1854 for cases in which the waste was more shallow. But the

case that is most often applied is a case for a driller. And the reason is that we were allowing some credit for the depth of the waste. So that was one of the major differences in the scenario.

Now, there were other differences. Uncertainty was accounted for because it was a probabilistic analysis that was done. More uncertainty was accounted for. Dosimetry change was accounted for because there was a dosimetry change since part 61 using ISCRP2. More modern dosimetry was used.

So there were several changes that were made, several differences between the analysis supporting the 1854 guidance and the waste classification tables. But the main idea was that there is this modifying factor applied to the sum of fractions contributions. And it's based on a line of credit for depth of disposal in intruder barrier.

CO-FACILITATOR LESLIE: Okay. Earl, Diane, and then Lisa? Diane?

MS. D'ARRIGO: I just wanted you to explain. You used the phrase you were comparing the amount that was brought up versus the amount that is in place. I wasn't quite sure what you were referring to.

DR. RIDGE: Certainly. And I probably shouldn't have said "amount." I should have said "concentration." Okay. If an intruder is assumed to go on the site, which an intruder is, and they are going to exhume the waste, when I say -- something I said a few times was credit was allowed for depth of disposal. What that means is that if you are disposing of waste that is at a greater depth, when you bring it up to the surface, you have also exhumed an amount of clean material because the waste is -- when I say credit was allowed for depth of disposal, essentially what that means in the equation is that you are assuming that there is mixing with the clean cover, all the clean grout that is on top of it.

And so by modifying the sum of fractions contributions, one way to look at it is that you are looking at a concentration after it has been mixed with these clean materials.

It might not be an important point.

MS. D'ARRIGO: Okay.

DR. RIDGE: I mean, that might just be the way I think of it. So that part might not be an important point. What is actually done is that you modify the contribution to the sum of fractions contributions based on, as I said, intruder barrier,

which determines what year it is you look at. A line of credit for an intruder barrier means you look at what year the disposal is assumed to happen, the intrusion is assumed to happen at. When I say --

MS. D'ARRIGO: So you account for decay?

DR. RIDGE: Yes, exactly. You account for decay. But we don't generally assume an intruder barrier lasts more than 500 years. So it's the difference between looking at 500, instead of 100.

So when I say allowing credit for an intruder barrier, specifically what that means is looking at the year of disposal. And when I say allowing credit for depth of disposal, specifically the way that comes into the equation is you have assumed some mixing with a clean cover and the clean grout.

Now, the original metal is also assumed some mixing with the cover, but in this case, we are assuming it is deeper. So there is more of it.

CO-FACILITATOR LESLIE: And can I try to paraphrase this? Are you saying that there is actually a different intruder scenario for this NUREG compared to what is done in the BTP?

DR. RIDGE: Yes.

CO-FACILITATOR LESLIE: Okay. Yes.

Diane, did you want to follow up?

MS. D'ARRIGO: Well, I just was having a little bit of a hard time envisioning what you were talking about because on one level, we are thinking of containers of B and C waste buried deep in trenches, and then on another scenario, we are looking at the bottom of tanks with sludge. And then it's obviously going to be more noticeable.

But how much if you were digging that up? I just was having a hard time envisioning what you were saying looking at the -- but you are applying this to both of those scenarios.

DR. RIDGE: I'm sorry. I don't understand.

MS. D'ARRIGO: Are you still having a hard time envisioning what I am saying or --

CO-FACILITATOR LESLIE: Well, let me try to --

MS. D'ARRIGO: -- you were having a hard time?

CO-FACILITATOR LESLIE: Let me try to paraphrase. I was trying to lead you in to say what are all of the things that were in that NUREG that were different than what were in the BTP because you have offered this up as one spot where you might, you

know, take approaches and --

DR. RIDGE: I did try to hit upon the four things, but let me list it as four things: intruder barrier, depth of disposal, uncertainty, and new dosimetry.

PARTICIPANT: Would you say it again, please?

DR. RIDGE: Intruder barrier, depth of disposal, uncertainty, and --

PARTICIPANT: New dosimetry,

DR. RIDGE: Thank you. And the fourth thing I said --

CO-FACILITATOR LESLIE: Was new dosimetry.

DR. RIDGE: New dosimetry. Thank you.

MS. D'ARRIGO: The four things are different in the two?

DR. RIDGE: Yes.

CO-FACILITATOR LESLIE: So that was kind of my point, to recognize that there were several things in this NUREG that might be percolating through Christianne's and Jim's mind. And those might be things that, you know --

DR. RIDGE: But the main idea, the main philosophical difference, is not really those four things. The main philosophical difference is allowing

credit for site-specific factors in waste classification. That is the main difference.

CO-FACILITATOR LESLIE: Okay. That is a good clarification.

Lisa and then David.

MS. EDWARDS: So, Christianne, if you look at the question in talking about how this could be applied in the Branch Technical Position, you had an instance where there was a particular intruder analysis that applied to this specific helo volume, right? Instead of the resident farmer or whatever, you looked at a drilling scenario.

But, Mark Lewis, correct me if I am wrong. We have some disposal sites that have no credible intruder scenarios because of their location as cited in your licensing requirement, right, by the agreement state? So how would you envision applying that kind of concept to say the Clive facility, where they are in the middle of the desert, people won't be drilling for water there, you know, how would you apply this concept in that type of case because you really have unlimited concentration limits, then, right?

DR. RIDGE: I understand your question. My thinking is that that is really a policy question as far as if we would ever assume that there is no

intruder. And, as you say, that would result in unlimited concentration, limited only by the off-site person and, you know -- but essentially the concentration specifically would not be limited.

And I am hesitant to speak for the Commission.

(Laughter.)

CO-FACILITATOR LESLIE: And this will be one of the few times today that Christianne is going to rein herself in. I'm just kidding.

DR. RIDGE: It may be.

CO-FACILITATOR LESLIE: Yes.

DR. RIDGE: It may be, but I think that is clearly -- essentially I think that is clearly a policy question whether we would ever submit there is no intruder.

CO-FACILITATOR LESLIE: Yes. David or Lisa, did you want to clarify?

MS. EDWARDS: Just to follow up to that. Some of the EPRI research -- and, Dave, you probably will elaborate on this, but really identifies that there are different conditions in different parts of the country.

And some of those environmental conditions are much more favorable to a long-term disposal

scenario than others because of the amount of waterfall they have where the water table is and what reasonable scenarios for future land use apply.

And, you know, quite frankly, right now that is not recognized anywhere in the guidance. But any reasonable amount of modeling would point out quickly how important and impactful it is in terms of looking at the long-term impact of the various scenarios.

That is why I bring it up. I am not looking for a limitless concentration limit. It's not in our thinking, in what is written down right now.

CO-FACILITATOR LESLIE: David?

MR. JAMES: Yes. I just wanted to kind of encapsulate all of what was said about the NUREG 1854 approach. Basically it is a case or a site-specific performance assessment and case and site-specific intruder scenarios.

We are still locked in with the BTP with the original EIS intruder scenario, the intruder agriculture, intruder construction. Those were the fundamental bases for the regulations. That was how we evaluated the volumes that were excavated by the intruder. And that really is the only basis that is behind those regulatory limits.

So we are still living with that, but we have added onto that the BTP criteria after 10 or 12 years of working with the old rule. Some of the criteria in the BTP just kind of go a little bit beyond the bases that were built in the original EIS analysis.

CO-FACILITATOR LESLIE: Okay. I have half the table who wants to talk. And so I guess trying to keep the discussion thread, who wants to kind of continue this discussion thread? Graham, did you have something to follow on? And then I will start going around to my left.

MR. JOHNSON: I just have one clarifying question for Christianne. You had mentioned uncertainty as one of the things that was different. Can you expound on how you use that and what effect it had in the analysis?

DR. RIDGE: The way that was looked at was essentially just that the new analysis was done probablistically. So there was uncertainty in the -- let's see -- in dose conversion factors. There was uncertainty in --

MR. JOHNSON: Source term uncertainty?

DR. RIDGE: Was it source term? I don't believe so. No. Obviously with an off-site, there

are a lot more things that can be uncertain with respect to hydrology. With the intruder, there aren't a lot of sources of uncertainty. And obviously I can't recall exactly what those all were. Certainly how much a person would eat was probably -- I'm not remembering that it was, but if I were going to do it again, I would say probably how much a person date would be uncertain, how much a person drank.

Your more important question was what effect that had and did it essentially raise limits or lower limits? And I don't know the answer to that question.

MR. JOHNSON: Thank you.

CO-FACILITATOR LESLIE: Okay. I am going to go to Earl, Diane, and then Jim.

MR. FORDHAM: Thanks. Actually, this idea kind of Lisa hit with the unrestricted idea limits.

A question that Marty had brought up was this land withdrawal, NNSS, Nevada Test Site by any other name. Hanford is looking at something in that same line. And just how irrevocable are those land withdrawals? I understand, you know, obviously WIPP is one idea where, you know, surface land use could happen again.

MR. LETOURNEAU: The land withdrawal is

less an issue of irrevocability and more a recognition of what is already there. Use Hanford 200 area as an example. You have got all of the tank farms. You have got the canyon facilities. You have got the old burial grounds. You have got the new burial grounds. You have got the commercial, the Northwest Compact Facility.

You have got so much source term that is not going away in that area that there cannot be a presumption that we are going to ever be able to walk away from that and not control it.

MR. FORDHAM: Can you put that in writing for me? I would love it. That would change my scenarios right off the bat. We would go from rural to industrial.

MR. LETOURNEAU: Well, you know, we are trying. We are trying. But even some place like Hanford or Savannah River, where we have that recognition, it's obviously very difficult to do. I can't do it. The Secretary can't do it. Congress needs to do it. Enough said.

MR. FORDHAM: Okay.

MR. LETOURNEAU: Let me just follow on to what David was saying, though. If you take any specific waste package based on the current

classification system and you put it in your commercial disposal facility and then you do a site-specific analysis on it looking at that specific depth, whatever intruder barriers you have, a probabilistic analysis with current dosimetry, you will get a different answer. That is the end result.

MR. JAMES: That's the number one result. We don't just work with that one package in the intruder scenarios. We take a much larger volume in the evaluation. So there's a much extended probability of mixing it up and getting an average concentration that more or less conforms to the site.

CO-FACILITATOR LESLIE: Diane? And then I'm going to go to Abigail. I have got to remind folks that we are supposed to in the agenda go to a public comment period at 11:15. So it doesn't mean that we are not going to come back to this, but I want to try to wrap up these people here. And depending on how many public comments we have, we will come right back into it.

MS. D'ARRIGO: Let me see what I am trying to say here. The radioactivity, the releases to underground water, and those kinds of scenarios, is that included in the uncertainty part of the four items?

It was determined long ago in 10 CFR 61 that the intruder scenario is limiting over the other kind of leakage risks. And I am wanting to know when we do the performance-based analysis, then that kind of leakage, that would have a higher importance because if you are assuming no intruder is possible, then other things would have more importance. And so I am trying to understand where that comes in this equation.

CO-FACILITATOR LESLIE: Christianne, do you want to try to answer that?

DR. RIDGE: The intruder is assumed to be limiting for the concentrations. The total activity at the site typically is limited by an analysis for an off-site receptor. And that is always done. So by focusing on intruder, we don't mean to say that the other scenario isn't done. The intruder was limiting for the concentrations.

Does that answer your question?

CO-FACILITATOR LESLIE: Okay. Abbie?

MS. CUTHBERTSON: Thanks. This is Abbie Cuthbertson from DOE. Unlike most of you here, I am not a safety expert. And I work on security issues. And I think that one of the things that we have been discussing is risk-informed decision-making. And I

think all of the risk we have been discussing is related to safety.

I think there are security risks, too. And there are some safety risks that I think fit into this. And I will get into my main points in the next section because they are mostly about concentration averaging and sealed sources.

But even if you can solve all of the issues with compact exclusion and with transportation containers and with transuranics and all of these other things that are currently challenges to sealed source disposal, the way that the Branch Technical Position is being interpreted now creates a gap in the activity of sealed sources that fall between 10 or 30 curies and GTCC. And those are some of the sealed sources of biggest concern from a security standpoint.

I think John mentioned Goiania earlier. You could also look at the recent events in Dehli where sealed sources were sold at a junk market and fell into the hands of someone who didn't know what they were.

And I think that if the gap can't be addressed somehow -- and I think this may be an opportunity to address that gap. Then 100 years from now or 500 years from now, you have sealed sources

that were never disposed of.

And so is it more likely that somebody will go looking for water next to a DOE site or uranium enrichment facility and dig down and happen to find the right container with the sealed source in it or that the sealed sources will fall out of regulatory control in 100 or 500 years and become both a safety and environmental and a security concern?

CO-FACILITATOR LESLIE: That's a great question. And I am going to hold discussion of that for now, again because we are going to try to -- if no one responds to it, I will certainly expect you to ask that question again.

Jim, did you still have something?

MR. KENNEDY: Yes. And I apologize if this isn't entirely clear because Abigail's point is relevant to this. But coming back to what Lisa and David said earlier, were you saying in so many words that you think the BTP should allow for site-specific analysis, instead of the current assumptions that they're now using, that's now used in the BTP? Is that the way you would like to see it written?

MR. JAMES: I'm not sure that I could answer all of that clearly in that respect. I think that when the BTP was constructed, industry made a lot

of arguments against putting that BTP out there because it really wasn't consistent with the disposal model that was in place. And I think that that view is still held.

So from that starting point, we would say that, number one, it's unnecessary. So we don't really know that, at least for some classes of material. But if we were going to implement something like that, then site-specific performance probably would be the way to go. And I think that is what you are advocating with the blending argument.

MS. EDWARDS: Can I respond to that, please?

CO-FACILITATOR LESLIE: Sure, Lisa.

MS. EDWARDS: This would be more from a Nuclear Energy Institute perspective. We always favor changes that recognize increased understanding of science and technology and the decision-making process.

We obviously have a lot more information now than we did 30 years ago. And we also advocate changes in guidance that reflect operating experience. So we have a whole lot more operating experience on our disposal sites than we did 30 years ago as well. And they tell us a lot of things.

We know that the assumptions that are in there right now don't reflect current disposal practices. If we are going to update the Branch Technical Position, that information should form, I would say, a base of what is possible of feasible.

So our kind of baseline approach of science and technology gives us a basis for kind of a framework of basic information, but there is a next step. And that is what is practical.

So once we kind of develop maybe the ditches on the side of the road from the science and technology and operating experience of what is feasible, practical comes into play and what can we actually implement in an effective manner, right?

So I think your question about whether the Branch Technical Position should kind of be thrown out more or less and be replaced or certainly implement site-specific performance assessment, the science would say that is appropriate. Okay?

We know that the conditions in one area of the country are very different than the conditions in another. And it has a direct impact on what intruder scenarios are applicable, are reasonable to consider. It also has a direct impact on those other pathways that Diane brought up for water intrusion and that

kind of thing for the off-site receptors.

And those should be taken into account from a strictly science standpoint. What you have to get to eventually, though, is what can be implemented. What can the states reasonably implement and interpret? And that is a little bit of a policy I think question for you.

At NEI, we will still go back to we want the basis to be the science and technology, but we understand that both what is practical and then ultimately what is acceptable have to help inform the decision that is ultimately reached.

MR. KENNEDY: Right. And this is where it becomes difficult because I bring up that question in light of what you said at the beginning, recognizing that there are some rulemakings ongoing and a longer-term part 61 revision that could completely change all of what we are talking about today. And so the question is what to do with the BTP in the meantime, notwithstanding science and engineering.

MS. EDWARDS: I think that is why I think my original comments focused on I think this step needs to be considered an interim step.

MR. KENNEDY: Yes.

MS. EDWARDS: So we are at a place right

now and we have problems and challenges that we should deal with right now and we are charged with dealing with right now.

So the revision to the Branch Technical Position could be that interim step until those later steps in the rulemaking decide on some of the policy stuff associated with the site-specific performance assessment in my opinion.

CO-FACILITATOR LESLIE: Thanks, Lisa.

And I am going to ask for the patience of the panelists because there have been people in the audience who have been quite patient waiting for their turn. And we have gone a little over the time line in terms of when I was planning to take comments from both.

We'll start here with the people in the room. And then we'll go to the phone. So I put this alphabetically. So, John Greeves, do you have any questions you would like to address or comments to the panelists at this point?

## VIII. PUBLIC QUESTIONS AND/OR COMMENTS

MR. GREEVES: Yes. I have got a comment, not a question. John Greeves with Talisman International. I found this quite interesting this morning.

Question 3. Bottom line, is the BTP necessary? My answer is no. Could it be eliminated? My answer is yes. I actually thought I was going to be a bit bold and in isolation, but listening to this table, I am heartened with what I hear.

Lisa said it quite correctly. The BTP, having lived with it for 30 years in both versions, is a non-site-specific approach because that is what we had to do back in those days. And we lived with the first version for 15 years. Now we have lived with the second version for 15. It is a very prescriptive approach.

NUREG 1854 is what we have learned in the regulatory business over the past ten years. And my comment is don't revise it. Set it aside. Put out interim guidance. I wouldn't even call it a BTP. And move towards 1854. Eighteen fifty-four has been worked by DOE and NRC. And it is flexible, suitably flexible.

So I don't think I am actually by myself on this point. What it will do, though, it will raise to you, the NRC staff, a question. You have got a schedule here that shows lots of things happening with the BTP. If you walk away from a meeting like this and your conclusion is you don't need the BTP, what

happens to all of these out-schedules that talk for issuing a draft, publishing, workshops, et cetera? I've got some great ideas what you can do with that, by the way. And with what is going on in Congress and on the Hill, people are going to have the knives out for your resources.

I'm taking too much time here, but I've given my answer to that question. And I am quite pleased with the experts around the panel in different words saying somewhat the same thing. What do we really need now? Is it a BTP or something else? So I will leave it with that.

CO-FACILITATOR LESLIE: Thank you very much, John.

Scott Kirk, did you have anything you want to talk about now or questions or comments?

MR. KIRK: Yes. Scott Kirk, Waste Control Specialists. My question is to Maurice. Maurice, I think on your slide number 4 -- now, you make reference to the homogeneity criteria and also the intruder analysis and, more importantly, the interim guidance that will be issued to agreement states here in the meantime. There is going to be a lot of work, I guess, over the next year or so to true up the Branch Technical Position.

So I would like to sort of understand the nexus between what is going to come out in this guidance in six weeks versus what we might learn over the course of the next year, when the BTP is really finalized and we understand what is needed for the intruder analysis and to address it like homogeneity criteria.

Does my question make sense?

CO-FACILITATOR LESLIE: Maurice, could I get you to --

MR. KENNEDY: I'm going to --

CO-FACILITATOR LESLIE: -- or Jim?

MR. KENNEDY: I'm going to take a stab at that.

CO-FACILITATOR LESLIE: Sure.

MR. KENNEDY: Our purpose with the interim guidance, which was one of the four tasks associated with our risk-informed, performance-based option for blending, was simply to say to the agreement states; in particular, Tennessee, what they need to consider between now and when the BTP is revised to address blending and revise the non-risk-informed blending positions that are currently in the BTP.

We are going to be saying as much as we can. You know, we made a commitment to get it out

pretty quickly. The SRM was issued in October. And the interim guidance is due the end of March. So we have actually got it going into concurrence next week.

And we simply are going to say as much as possible. We are not going to be able to say anywhere near as much as the final BTP when it address blending, we will say, because we will have a lot of public input by that time. And we will have had a lot more time to think about these issues. But we are going to be saying things that you need to relate this to the site-specific performance assessment, that you need to address homogeneity and talk a little bit about that. Maybe Christianne might want to elaborate and so forth.

We are simply going to be saying as much as we can in the short time that is available so that states that have blending proposals, namely Tennessee, can have something, some word, from NRC on what to do.

MR. KIRK: That answers my question. Thank you very much.

MR. KENNEDY: Okay.

CO-FACILITATOR LESLIE: Thanks, Scott.

Jim Lieberman, any questions right now? Thank you. Tom Majette?

MR. MAJETTE: Thank you. Hi. I'm Tom

Majette. I'm with EnergySolutions.

I would like to offer one comment that kind of relates both to Federal Register questions number 1 and 9 and also maybe new Jim Kennedy question number 10, particularly as it relates to this concept of harmonizing NRC guidance with what happens in other agencies and the idea that maybe NUREG 1854 is not so much a global solution but an example of how you might accomplish that and also possibly touching on question number 3 given John Greeves' suggestion that you don't need a BTP. You do interim guidance, which might be the BTP. So that is the topic of my comment.

So it seems to me that, as I understand the notion that there is a probability of one for an inadvertent intruder, that really derives from the regulation 61.42, which says, "Ensure the protection of any individual who may," et cetera, et cetera. So presumably the NRC views that as not allowing them the opportunity to apply a probabilistic factor to an inadvertent intruder.

Nonetheless, I think you can provide protection for an inadvertent intruder without some of the prescriptive nature of and the limits on averaging that are in the BTP going to those two questions.

Can you relax those limits on averaging

and still protect an intruder? And I would say that you can and that you could do that, in part, by looking at some of what DOE does. And by being essentially more reliant on a site-specific approach, I think you could do that in guidance.

I think 61.13 really essentially says you can do that, the Lieberman-Greeves solution, which his not the newest John Grisham novel but the letter that they wrote to the Commission that most of you are familiar with.

So you have I think provision in your regulations that allow you to do this. I think you can do it under guidance. I think you can do what NUREG 1554 did in terms of where it could rely on some improvements in science, as NEI and EPRI are proposing, improved dosimetry, site-specific factors. So I think you have the opportunity to do all of those things.

I think that to me the best approach is to relax those limits on averaging because they don't protect an intruder per se. And even if you do assume a probability of one for an inadvertent intruder at any site, I think you should allow that site-specific analysis to acknowledge that out of sight you may have stability, recognizable waste form, engineered

barriers, even for class A waste, which protect the intruder by providing that recognition factor.

61.42 doesn't say, "You get this much dose" or "You get this much waste." It just says, "Protect." And, even if you take it as a probability of one, I don't think you have to be that prescriptive to do that. And the way to do that is with an 1854 kind of approach. So that's I think my answer to those 1, 3, 9 and Jim Kennedy question number 10.

CO-FACILITATOR LESLIE: Thanks.

Mike, did you have any questions at this point? Okay. All right. If you'll give me a moment while I walk to the phone and get my list of people on the line? And we'll walk through here for a second. At this point, I'm going to let it open for the people on the phone. Is there anyone in particular that has a comment or a question for the panel? Is there still anyone on the phone?

MR. DIXON: This is George Dixon. I have no particular questions at this point.

CO-FACILITATOR LESLIE: Okay.

MR. HAMMEL: Yes. I don't have any here either, just listening with interest.

CO-FACILITATOR LESLIE: Okay. Was that Jeff or Lee?

MR. HAMMEL: Lee.

CO-FACILITATOR LESLIE: Okay. Jeff or Mark or --

MR. LONG: Same for Jeff.

CO-FACILITATOR LESLIE: Okay.

MR. WETTERHAHN: Same for Mark.

CO-FACILITATOR LESLIE: And, Christie, are you still there?

MS. CLEM: Yes, I am. I have no questions at this time.

CO-FACILITATOR LESLIE: Okay. Is there anyone else on the phone?

MR. AZAR: Yes. Miguel Azar. I've got a question.

CO-FACILITATOR LESLIE: Okay.

MR. AZAR: It seems you are trying to solve world hunger here. You are trying to take the whole issue at hand. I guess if you were to break it down into its subcomponents, like sources, just one area, could the regulation be written in such a way to either include or come up with a different design for how you would treat sources or exclude them from the burial site altogether if there is such an issue?

CO-FACILITATOR LESLIE: Were people clear on the question? Can you try to rephrase your

question again? And I didn't catch your last name. Azar? Okay. A-z-a-r.

John Cochran?

DR. COCHRAN: I thought what he was saying was we're taking on the entire elephant and you can't eat an elephant at once. So could we break the discussion down into individual components and try to take on the problem that way?

That's what I thought he was saying as let's not try to solve world hunger. Let's not try to eat the entire elephant at once. Let's break it down into components and talk about the components. That's what I thought I heard.

CO-FACILITATOR LESLIE: Okay. So I think perhaps we are going to deal with some of the more specific things later in the discussion period. So that's a good comment. And I think we are going to address that a little bit later.

In fact, one of the things that I will do at the end of the day is kind of both Larry and John Cochran laid out kind of the bits of the elephant or the eight factors that they needed to consider or that are in the BTP. And I kind of will try to pulse the crowd, not just about the discussion questions we have had, but, you know, have all the bits of the elephant

been touched upon, not necessarily eaten?

Is there anyone else on the phone at this point that would like to make a comment or question?

MR. LAMBERT: This is Rusty and some others from Utah. We don't have a question. We are just glad to be able to participate.

CO-FACILITATOR LESLIE: Thank you very much.

MR. JANATI: Rick Janati, Pennsylvania. No comments at this point.

CO-FACILITATOR LESLIE: Okay. All right. I am going to move the microphone away from the phone. And I will kind of ask this question. Our agenda right now would have us breaking in ten minutes. I think we have talked through question 9. I didn't think I heard anything on question 3. I don't necessarily want to start a new question with ten minutes to go. So you guys have touched on this. Okay. So I am grounding myself here.

So if we are done and don't have any other questions on this slide on the Federal Register notice questions 9 and 3, I don't really want to start a discussion on a new topic.

And, Larry, you have got a comment?

MR. CAMPER: Well, I would like to when

you are done.

CO-FACILITATOR LESLIE: Okay. So before we actually break for lunch, then I will give it to Larry. But the idea is whatever Larry has to say will be the last words before we go to lunch. Well, hopefully it will be the last words. And then right after he finished -- I don't know how long-winded he will be -- I will let you know when we need to be back.

Larry, you got me earlier on in the meeting. So, you know, payback.

MR. CAMPER: Oh, no, no. They want to eat.

I thought it would be kind of a good time to share with you some of my "Aha" moments as I sit there. It's just too many if I want until the end of the day. So bear with me. You know, I'll try not to keep you from lunch too long.

It's very interesting to listen to this discussion because what you are doing is you are thinking great thoughts. And it's not surprising to me that there was a lot of dialogue about how do we take on the elephant, how do we solve the big problem? Okay.

The problem we have is, as you know, the

regulatory process is just that. It's a process. It's a step-by-step kind of thing.

So many of these comments, such as operating practices have changed dramatically since part 61 was created 30 years ago or so, the role of the environmental -- you know, there was no regulatory impact analysis for part 61. The environmental impact statement served for that purpose. We wouldn't do that today. The process would be different. So the environmental impact statement became an extremely important part of part 61.

You know, we have had discussions about the scenarios that were assumed and so forth and so on and those things led to driving the waste classification system and so forth and so on.

So one observation is that a lot of the comments really get at what should be the construct of the low-level waste regulations for us in the United States today given 30 years of operating experience, given that we now know a lot more things than we did before, and so forth and so on, given the role of the environmental impact statement at the time as compared with what the role of a typical environmental impact statement is today to satisfy NEPA requirements.

So it is kind of an "Aha" moment. And I

always and the staff have talked a number of times about whatever you do -- and if you read the big paper, the part 61 paper, we cited several places in that paper where the environmental impact analysis would probably have to be updated. And you probably would have to do a current environmental impact statement for the reasons which I would summarily point out in Lisa's comment, you know, following good technology, good science, changes, and so forth.

So that is an observation. So the second thing is, you know, there is no period of performance specified in part 61. And, yet, we had lots of talk about 100 years, a few hundred years, 100 years.

And Diane, of course, asked a couple interesting questions about those numbers, but you don't have a POP specified. You have considerations that went into defining the class based upon the analyses that were done in the environmental impact statement. That is not the same thing as a regulatory compliance for a period of performance, not the same thing. So, you know, it kind of raises a question, should there be a period of performance in part 61? And if so, what should it be?

This question of the interim guidance as compared to the BTP, I mean, again, we've got to step

back and say, "Where are we in the process? At the moment we have a charge from the Commission that, among other things, that dealt with blending was to produce interim guidance.

This is not unlike what happened when the Commission made its decision coming out of SECY-08-0147 regarding depleted uranium. We were charged with providing some interim guidance. That is because it takes time to create any regulatory change. And the real world doesn't stop in the meantime. Therefore, there is a need for interim guidance.

So the staff has a charge before it now to develop interim guidance. And we will develop interim guidance.

I think Jim did a very fine job of pointing out that when we create interim guidance, we strive not to create new policy. It will be an articulation of what exists now that is designed to be guidance to help real time until such time as the rule is finalized and there is a policy change, if you will.

The question of the BTP, I mean, the BTP, today we have a system that relies upon the waste classification system. Now, there are requirements in part 61 to do site-specific analyses. There is a

requirement to protect and inadvertent intruder.

And I have always said I don't know how you design an operating facility if you don't have a thorough analysis, an expectation, understanding of all of the radioactive material to be disposed of, in what quantity. That changes over time, so forth and so on.

But a site-specific performance assessment by definition has changed, too. What we now say when we refer to that term is different than what was envisioned in 61.12, 61.13. And one of the things that we are looking at in the rule dealing with unique waste streams -- and it was talked about in the public meetings -- is to what degree are there any adjustments needed to 61.12 and 61.13 or, for that matter, 61.17, which is the concept section.

So we are looking at that, but this idea that a site-specific performance assessment becomes the driver, as compared to the existing waste classification system, remember, the charge at the moment is require a site-specific performance assessment for unique waste streams, including large quantities of depleted uranium. The charge wasn't require site-specific performance assessment for all radionuclides.

Now, John Greeves and Jim Lieberman in their letter to the Commission pointed out that maybe that is what you ought to do, maybe that is what you ought to do, staff. And the point that I have made with John and Jim is that that is a good comment. It is a very good comment at the time of the proposed rule because for the staff to take that on now would mean you would have to go back to the Commission and communicate with the fact that we told you something in SECY-08-147 and you, Commission, told us to go forth and do what we recommended. That would be changing the recommendation. So we would have to communicate further with the Commission.

So at the moment this notion of a site-specific performance assessment deals with unique waste streams. And, as much as I have come to dislike that term "unique waste streams," what it means is those waste streams that weren't analyzed at the time we created part 61.

So thoughts about the role of a site-specific analysis more broadly are something that is going to be suitable to talk about when we talk about part 61 at large. Now, we have our first public meeting out in Phoenix following the Waste Management Symposium on March 4, where we are going to talk about

the part 61 paper. And some of those kinds of commentary are quite suitable when you start talking about what should 61 be like in general. What should part 61 be like in toto?

And so the points that I would make are two. One is I think that many of the thoughts that are being expressed are great thoughts. And it is only natural that we would have those thoughts from such an august group. However, big picture, they are much more along the lines of what should part 61 be like, as compared to we have a regulation today. We have a BTP that has been in place for many, many years. We are trying to find ways to specifically refine it because it will be with us for quite some time.

And oh, by the way, I have -- you know, Christianne said earlier, "I would never pretend to speak for the Commission." And certainly neither would I. I have no idea, we have no idea as a staff what is going to happen with part 61. We over the next year are going to be having a lot of public meetings, a lot of stakeholder input.

We are going to go back to the Commission with some recommendation in December of '12. No idea, no idea. So we may end up with something remarkably

different than what we have today or we may end up with something that is tweaked just a little bit or we may end up with something that doesn't change very much at all. Don't know, shouldn't know. That would not be consistent with the process.

So, again, the issue for us at the moment is what do we do to refine the BTP? What do we do to address these specific questions? I thought, Tom, your comments there at the end, you brought us back to questions 3, 9, and 10. So the more you can bring yourselves back to the question at hand, the more you give us to take away with at the moment.

That is not a criticism or an admonishment. It's just an observation. And it is not surprising. This always happens when you are talking about a specific document or something. It is only natural that we talk about bigger picture issues, especially when you are thinking about the fact that, although part 61 has served us well for many, many years, it really is time to take another look at it, I mean, for the obvious reasons. Lisa, I think you summed it up very well.

So, anyway, just some "Aha" moments from my vantage point so I don't have to do all of that at the end of the day.

CO-FACILITATOR LESLIE: Thanks, Larry. And those were good comments. And if you can go one slide, please. It kind of puts in perspective that when Christianne introduced this, she said we are starting from the more general things, and we are going to move to the more specific things.

I am very grateful for everyone's participation so far. I am really happy that we managed to get through the averaging provisions and the intruder analysis because, even in the introductory comments, most of the concerns and the detailed questions and comments had to do with limits to averaging and so on and so forth.

So the good news is we are going to break for lunch on time. And we have two long slots to address each of the following things after lunch. I think Maurice on the table to the left as you go out has a list of nearby restaurants. There is, of course, the Phillip's right there.

According to the agenda, we are supposed to break at 11:45 and come back at 12:50. And, by my watch, we are at 11:45. So I will look forward to seeing you all at 12:50.

For the people on the bridge line, we are going to mute on this side. You can hang up on the

phone and dial back in or you can stay connected. I will leave it up to the people on the phone. And we will get back to you around 12:45, make sure you are still there on the phone. Thanks.

(Whereupon, a luncheon recess was taken at 11:47 a.m.)

A F T E R N O O N S E S S I O N

12:56 p.m.

MS. ADELSTEIN: Good afternoon. Okay, thank you. You may have noticed that I am not Bret. I am Patricia Adelstein, and I'll be your guide for the next hour and a half or so. The only difference between Bret and I is that Bret has longer hair that I do. So we'll get started, and one of the --

I just wanted to recap very, very quickly what happened this morning. We covered a number of questions, and we still have one other question to attend to, which is number eight, which I'll go to in just a second. This afternoon we'll just continue the discussion in the order that are listed on the PowerPoint, and then we'll have a discussion. We'll have a break around 2:30.

We'll have another discussion and public comments, and we'll try to break around 4:30 if we can. But I can't guarantee anything, okay. Okay. All right. Question number -- oh, the other thing I probably need to tell you is is that I am not as highly technical or any technical as Bret. So I won't make any comments, which means that you all, the panel members, need to help me out and help yourself out by,

you know, engaging in a conversation where you have the ground rules.

One person at a time, constructive, concise and crisp. All viewpoints will be heard, and that to speak, you turn over on the side. Okay, all right. Okay. Number eight, I'll open it. I'm sorry. We have on the telephone, let's go around very quickly. I'm going to walk over to the telephone and put the microphone next to telephone to see who's there. Hello?

MR. SAFER: This is Don Safer from the Tennessee Environmental Council, Nashville, Tennessee.

MS. ADELSTEIN: Okay, all right. Thank you. Who's next?

MR. HAMMEL: Lee Hammel with Progress Energy.

MS. ADELSTEIN: Okay, thank you.

MR. LONG: Jeff Long, American Electric Power.

MS. ADELSTEIN: All right.

MR. WETTERHAHN: Mark Wetterhahn, member of the public.

MS. ADELSTEIN: Okay. Anyone else?

MR. LAMBERT: This is Rusty Lambert of Utah.

MS. ADELSTEIN: All right, thank you. Okay. Speak now, or forever hold your peace. Okay, all right. Let's get started. Okay. As I understand it, Question No. 8 we didn't address, but or that it wasn't specifically asked, but that there was some general conversation about it. Before we move on, you all wanted to get any feedback about Question No. 8 because it really wasn't specifically addressed.

So I'm going to open up the floor to the panel, and this question refers to heterogeneity in waste concentrations in site-specific intruder analysis. David? Oh, I'm sorry.

MR. JAMES: This is David James again. I just got tasked with having to open the discussion on this subject, but we did have kind of a prepared statement, and I'm just going to go over it, kind of paraphrase it. But the applicability of the intruder scenarios that are applied here take into account various site attributes, including site characteristics, barriers, waste form, etcetera, that if we did that using the current disposal practice, that the intruder scenarios that we're working with really don't apply.

MS. ADELSTEIN: Could you get a little closer the mic? I'm concerned that people on the

telephone can't hear you. Thank you.

MR. JAMES: Okay. If it's determined that one or more of the intruder scenarios do apply, then heterogeneity should be considered in the context of the 232 cubic meters that were specified in NUREG 782. If we assume that the scenario is still operable, then the waste should be distributed within the disposal site, such that a non-compliant volume couldn't be excavated.

But the actual treatment of heterogeneity within an individual package really goes beyond what can be evaluated in that kind of a scenario. If we move away from the traditional intruder scenarios, the construction and agriculture, and go to lesser exposure scenarios like drilling or discovery of whatever it might be, the exposure potential from those scenarios is substantially less.

We still could go with much higher activity within an individual package on a drilling scenario than we could on an overall basis, if we're looking at the cases of an intruder excavation for a house or something like that.

If the site itself is maintained as an industrial site or not viable for homesteading, or whatever we actually call that intruder scenario, then

again we kind of obviate the need for such restrictive averaging within the individual packages.

The question of heterogeneity within the package in the current disposal context, and from where the current disposal regulatory concentrations were derived, is really not even applicable to the scenario.

So I guess that's the start salvo in the discussion. We don't believe that heterogeneity, as it's driven by the averaging criteria in the BTP, really has any applicability to our current disposal models or the way that we dispose of our waste.

MS. ADELSTEIN: Okay. Thank you very much. Okay. Questions or comments? Okay, John. Does it pertain to this, or are you -- okay, yes.

DR. COCHRAN: I would certainly agree that actual intrusion, right, with a backhoe, digging a basement, is going to mix up the soil. My question is has anybody done any studies to sort of quantify how much mixing would really occur?

MS. ADELSTEIN: Speak into the mic.

MR. JAMES: I was going to say well, consider that, you know, in the model that was developed, it wasn't assumed that the person was digging with a backhoe. It was digging with a shovel,

and that the waste would be excavated to the sides of the foundation that he was creating. Then from, there, it would be spread.

Certainly if you've got 50 different liners you're going to be mixing the soil probably -- I think within the volume context is the first two meters of it are still assumed to be pure soil without any contamination. So you're going to get at least a factor of three mixing just from that process.

As it goes, that would be it, plus whatever mixture that you have in the trench would be at trench average concentrations roughly.

MS. ADELSTEIN: Okay. Does that help John? Do you have any follow-up questions at this point? Push the button.

DR. COCHRAN: My question was a little bit different, but and just to follow up on your point, I think that the EIS assumes actually reduction of a factor of eight. So you've got two meters of clean cover, one meter of waste, and then that meter of waste is actually waste plus interwaste soil. So I think the EIS assumes reduction of a factor of eight.

But my question was more about the physical mixing, and to be honest with you I don't recall the excavation with a shovel. So that's why I

have to go and look back up.

MR. JAMES: So I don't know that it's specifically stated, but based on the time that the intruder spends in the excavation, that it was like several months in the process, that I assume was more or less manually excavated.

Getting maybe a little bit more to your point, since the material is spread around, even if it isn't mixed, you know, to a completely homogeneous mixture coming out of the trench, you have occupancy considerations an individual spots, that if you aren't going to assume that if you had a hot spot in your garden, that the intruder's going to spending his whole day there.

The exposure would be spread out over time, based on where he's going, if it's directly under his house and he still has a foundation shield to the intruder. But in any case, that the volume that the intruder is exposed to isn't, you know, an eight-inch drill hole. It's 200 cubic meters. So there's a lot of -- or at least in the context of that excavation.

There is mixing. There is occupancy time considerations that go into the evaluation. And again, if there are hot spots or non-uniformity of the

mixing, it's more or less compensated for in the distribution of occupancy in the evaluation.

MS. ADELSTEIN: Okay. John, you have your card up, but okay, great. Diane? Speak into the mic please.

MS. D'ARRIGO: Why -- okay. So this is heterogeneity, either in containers or in different kind of waste in the same trench? Is that what that means, this question?

MR. JAMES: Effectively, I think.

MS. D'ARRIGO: Okay, and so you're saying, David, that it should -- there shouldn't be any special consideration for it because why? Everything else compensates for it? I mean I wasn't quite sure why you thought it didn't need to be considered.

MR. JAMES: I was talking about heterogeneity within an individual waste package. Our exposure model for evaluating that incident assumes that the intruder doesn't just encounter one package with the higher activity in it, or even some part of that package. He encounters the whole package at the average concentration values, and then he actually mixes that package with its neighboring packages.

So that what the intruder is actually being exposed to are concentrations that are

commensurate with the average concentrations in the disposal site.

MS. D'ARRIGO: Why couldn't the person get exposed to a hot spot and --

MR. JAMES: He can get exposed to a hot spot. It's okay. He isn't going to live on that hot spot. He maybe encountered that hot spot for a brief period of any given day, but he would not be tied to that hot spot. You have to evaluate it over the whole exposure scenario.

MS. ADELSTEIN: Okay. Does that help, Diane? okay. Marty, you had your -- and then you'll wait. Okay. Chris Young.

DR. RIDGE: I think given that we've recognized that disposal practices are a little different, are significantly, in some cases, different today when what was envisioned in the IS, I think it's good to reflect on this averaging, not only in light of a -- not only thinking about an intruder who exhumes a basement, but also a well driller.

While I agree there's substantial mixing if you assume that someone's drilling a basement, if you have a well-driller, you're looking at a lot less volume. So I think part of the impetus for this question is whether or not there needs to be guidance

on what an intruder would hit, and I think it's a little easier to think of that when you're thinking about exhuming enough waste for a basement.

It's a little more challenging, maybe, to think about the question in terms of someone who hits a smaller volume, for example, a well driller. So I think one of the things that would be very useful to us in this discussion might be to get some feedback on given that, you know, waste is not uniform when it's put into a site, what are appropriate assumptions about what an intruder might hit if they are exhuming a smaller volume. I think that's where the more challenging view might be.

MS. ADELSTEIN: Okay. Comments to Christianne? Yes, Earl.

MR. FORDHAM: Christianne, I think --

MS. ADELSTEIN: Earl and then Marty and then --

MR. FORDHAM: --some of this comes down to what is fairly achievable out there. You know, after you've got a closed trench, you've got an activity level in the trench, divided by the volume. So all you've got is true averaging. Now are you asking here how to consider it in site-specific intruder analysis?

The only thing I can tell you in something

like that is you're going to have to take the trench average, you know, if you can identify which trench the intruder's going to drill through for his well, which is, you know, you may want to take the highest average one.

Then you know, you might be able to, by sampling some of the manifest, get an idea of what your sigma is. Class A levels, in reality, you know, pretty low. So I mean your best bet. Out at U.S. Ecology, we don't GPS in Class A waste. Class B and C, initially we were 50 by 50 by 25. So we can get you, you know, some additional information for your use in the intruder scenario.

But I don't think you're going to get anything better than an average plus or minus a sigma. Then you'll have to treat it as you did in 1854 with uncertainty.

MS. ADELSTEIN: Earl or Marty, excuse me.

MR. LETOURNEAU: Yes. My comment is along the same lines, that this is one of those areas where you have to begin to be careful about what it is you're asking for and what you're trying to do, because when you're looking at prospectively a new facility or a new cell, and you're trying to do a performance assessment or intruder scenario on it,

you're not going to be able to model heterogeneity.

You don't know what's going into the facility. You're going to have to do volume and average across the cell. Invariably, what you begin to get will be different. It will be at some level heterogeneic. Some of it will be a little bit higher; some of it will be a little bit lower.

You run the risk of setting yourselves up to have to do a site-specific analysis on everything you've received, if you're not too careful about how you interpret this. That's one of the reasons why we use simplifying assumptions and we set up a WAC based on averaging across the whole volume and then manage to that, knowing that there are conservatisms built in, but on the whole, we expect it to come out in the wash.

MS. ADELSTEIN: Okay. I see quite a few cards going up or have gone up. So Diane, and hold on, Diane. After Diane, we'll have John and Lisa and David, okay. If some of your comments have already been said, we respectfully ask that you hold off on saying those, okay?

MS. D'ARRIGO: This is another background question that I should already know the answer to but I don't right now. When the scenarios are done now,

do you assume that the concentrations for A are at the top of the range, or are the calculations done at an average of that range?

MR. FORDHAM: Our assessment out at Hanford used trench averages, and then overall performance was done over the site average, as expected in the year 2063 when we close.

MS. D'ARRIGO: So you're keeping track?

MR. FORDHAM: Right.

MS. D'ARRIGO: But when the 10 C.F.R. 1 EIS was done, do you guys know if they used the top of the range for Class A or the average?

DR. RIDGE: No.

MS. D'ARRIGO: Okay.

DR. RIDGE: Well, it was a backwards calculation to see what -- in the EIS, they were determining what the classification limits would be, and they assumed that there was some mixing of higher activity waste with lower activity waste.

MS. D'ARRIGO: Right. I'm just trying to -- all right. I'll have to just look at it.

DR. RIDGE: Okay. I'd like to answer your question, if that doesn't do it.

MS. D'ARRIGO: Well, I guess I'm not exactly sure what I'm asking. It's that we're looking

at a scenario in reality now where if we do downblending of BNC (ph) to Class A, that the waste that would go to Utah would be potentially much closer to the top of the Class A range.

And so I'm wanting to know if the current analyses that have been done assume that amount of risk. Like was that risk level calculated for the top of Class A, or was it, was the calculation done for assuming that -- the reality is that A is usually much lower, so they used a different average. Do you understand the question?

DR. RIDGE: Yes, I think I do, and for the concentrations that were in the EIS, of course it was what they were calculating was what the top of the Class A range.

MS. D'ARRIGO: Right.

DR. RIDGE: And the assumption was actually for Class C, it's a little different. For Class C, it was assumed that all of the waste that you would bring up was that there was some waste at the top limit, and any waste that was at the top limit for any radionuclide was mixed with waste below the limit.

So it was not assumed that it was all at the limit, to answer your question, for Class C.

MS. D'ARRIGO: For Class C.

DR. RIDGE: For Class C. For Class A, cesium was singled out and treated a little differently. For most -- so again, it's a backwards calculation. So it wasn't saying these things are at the limit.

But for cesium, there was an extra dilution factor built in. It was treated like Class C waste, and it was assumed that anything you brought up that was at the top of the limit for cesium was mixed with waste that was not at the top limit for cesium.

Part of the reason was that it was observed that most Class A waste wasn't, especially for cesium, wasn't very close to the limit. That, I'm assuming, is the logic why -- well, in the EIS they lay out, that is the logic why cesium was singled out.

For the rest of Class A, yes, those concentrations, they were mixed with soil and copper, as we've discussed with respect to the scenarios, but not with other waste. So to answer your question, it was not assumed --

MS. D'ARRIGO: So the rule of the fraction -- okay.

DR. RIDGE: It was not assumed that it was full right at the limit, because they assumed that anything that had cesium at the limit, that the cesium

was diluted, with lower activity waste. Did that get -- did that answer it?

MS. D'ARRIGO: And so --

MS. ADELSTEIN: Diane, I don't want to stop the conversation. However, you've got about five people who still want to make some comments. Is this something that you could take offline? Okay, great. Thank you. Okay. Mark, I just wanted to let you know that you'll be after David. Okay, and John?

MR. LEPERE: I guess I just wanted to address the question of heterogeneity in the waste, and I would offer up an idea that my esteemed colleagues can comment on.

If we assume that concentration averaging has been applied to an individual package, and you have an average concentration if you take the concentration that's factored higher, than you should be addressing heterogeneity within the context of what we've been doing, in terms of disposal. Does that make sense?

Worse case scenario, if you've got a non-homogeneous package, you're going to be a factor of ten above that concentration.

MS. ADELSTEIN: Okay, all right. Lisa. Graham, did you have your -- no, okay. Lisa. Speak

into the mic.

MS. EDWARDS: So the introduction of a drilling scenario actually raises a few questions for me, because this is not a scenario that was well-developed in kind of the history.

So some of the things that I don't have enough information to evaluate it from is in the previous scenario of the 232 cubic meters being excavated, there was an analysis basically done of there will be this much cover depth over this much area, and that leads you to some relative amount of mixing between waste material, and cover material or non-contaminated material.

In a drilling scenario, I don't have enough information because I haven't analyzed that, to understand what the relative mixing in that scenario would be, because you might jump to the conclusion that the amount of mixing is lower, somehow, than it is in the basement scenario.

But in fact, you're talking about hitting, first of all, a much smaller amount of waste. But you're still going through a considerable depth to get to that waste, and if you are really drilling, you are probably potentially drilling even below the waste.

So I think before we arbitrarily introduce

a new scenario and make assumptions about the constraints that scenario represent, there has to be a better understanding of that, of what that scenario really means.

I would make two other points. The first is is that if you're going to introduce a new scenario, I think it again makes me suggest that we would need to revisit the 100-year assumption and the reasonableness of the 100-year assumption.

If it's reasonable to introduce a brand-new scenario, and I'm not saying it's not, it's reasonable for us to challenge those assumptions that around that scenario, including the 100 years.

MS. ADELSTEIN: And you have one more point?

MS. EDWARDS: And one more point.

MS. ADELSTEIN: Okay.

MS. EDWARDS: On sealed sources, I think sometimes what I'm hearing in some of the opinions and perspectives that need to be addressed from health and safety protection is that there's a most limiting case introduced by the concentration of activity in sealed sources.

I'm not at all suggesting that sealed sources should be prohibited from entering the

disposal site, because I very much agree with the point that Abbie made.

However, I think that the constraints that we develop for waste streams that are dissimilar from sealed sources should reflect the risk of those waste streams. If the risk of sealed sources is different, then different constraints should be applied to sealed sources.

That way, you could assure a safety disposal of environment for that waste stream, without arbitrarily or overly-conservative constraints being placed on other waste streams that it does not apply to from a risk basis.

MS. ADELSTEIN: Okay. Christianne, You have your hand or your have your card up, and I'm going to ask is it a clarifying question or comment? I would like to go on with the others. Are you going to lose the thread if you do?

(Off mic comment.)

MS. ADELSTEIN: Short response, and then we're going to move on.

DR. RIDGE: Yes. I just wanted to clarify that the driller I was using as an example. We've talked a lot today about using more site-specific scenarios. So I didn't necessarily mean any

particular scenario.

But we have looked at the driller in some context, and that's an example of what might be a scenario where you would exhume a little less waste, and that makes the heterogeneity a little bit more challenging to look at, just as an example.

MS. ADELSTEIN: Okay, David? Thank you.

MR. JAMES: Yes. I just had one comment. That is that in all sense, the drilling scenario itself is a lot less conservative than the agriculture and construction scenarios, that we can tolerate much higher activities and keep the dose constraints and performance objectives in bounds. I think that's as far as I want to go with that.

MS. ADELSTEIN: Okay. All right, Mark?

MR. LEWIS: I guess I just still want to address the reality, I guess, and the probability. You know, if you think about the fact that you really need to assume what credible scenario is going to occur when you look at the probability of that, just as an example on the drilling or even on digging a basement for a house.

I mean who's going to try to drill a well in the desert, or try to put a basement in the desert on a piece of property that they don't know is going

to be a radioactive disposal site.

Even if they do, and they hit man-made barriers such as concrete faults for resins, or six inches of steel shell on a steam generator, you know, what's the probability of them bringing up a high concentration of material and be exposed to anything.

So I think some reality needs to go into how you go about doing that intruder scenario analysis.

MS. ADELSTEIN: Okay. John, is this a clarifying question or you're responding?

(Off mic comment.)

MS. ADELSTEIN: Okay, that's fine. We want to move on soon, so but go ahead.

DR. COCHRAN: And I'll just repeat some of what was in the EIS. The EIS states that the probability of future human actions are unknowable. So the fact that people might be building subdivisions on the outskirts of Tucson 50 years ago seemed zero probability. I mean, because nobody would want to live out there and now they do.

So the EIS simply states that the probability of future actions are unknowable, and the NRC went ahead and conservatively assumed that intrusion would occur, the probability of one, and

then placed some limits on that.

Then later in the EIS process, backed off by a factor of ten, to account for the fact that markers might actually work. The probability of human intrusion might be less than one, and not all the waste would be at the top of the limit, whether it would be A, B or C.

So the EIS states the future's unknowable, but they did go ahead and back down by a factor of ten in the end, in part to account for probability.

MS. ADELSTEIN: Okay, thanks. Can we move on? Is everybody ready to move on to the next question? Okay, great. If you could go to the slide that has all four. I think it's Slide No. 7. This slide right here. Would you go to that one for me. Got it. Oh, that was fast.

All right. So here we are in the sequence limits to averaging, Q4, 5 and 2. The first one is averaging volumes for waste classification, and here are the questions. There are also copies of the questions as well. So I'm opening it up to the panel. Number four? Lisa.

MS. EDWARDS: Well, I would suggest that the conversation we just had addressed much of the content of the question in number four.

MS. ADELSTEIN: Any other comments about that?

(No response.)

MS. ADELSTEIN: So moving to the next question, can we do that? Do I have consensus on that? Yes, Christianne.

DR. RIDGE: They are very closely related questions. The one we've just discussed relating specifically to the intruder analysis, as part of protection for 6142. This one related to waste classification. It's not explicitly asked for here, but one question that I had in looking at these two questions in the FRN was whether those scenarios need to always been the same.

I don't know if we could get -- I know we do want to keep to schedule, but when we are thinking about the guidance to come, one question we have is if we have guidance on what you need to assume for the volume and the concentration of waste and intruder hits.

You have separate guidance on the volumes of waste you're allowed to average over for concentration averaging. Do those need to be the same volumes, or could you say for 6142 we're doing an analysis where an intruder hits the average over the

whole trench, but for waste classification, we're looking at the average on a package basis?

Or could you say for an intruder scenario, we're assuming an intruder is exhume a very small amount of waste as a well driller? So for the 6142 analysis, we will only allow you to average over a container volume or subcontainer volume, although that I grant you it seems like it would be difficult to do a subcontainer volume.

But a very small volume that a certain type of intruder might exhume in the 6142 analysis, and yet for waste classification, move to a container or perhaps a group of containers or something larger that Question No. 4 is asking, and I think one question for us is do those volumes always need to be the same, or could you be considering different volumes with respect to waste classification, and for the analysis you're ding for 6142?

MS. ADELSTEIN: Okay. Does everyone understand the question, to the extent that -- okay, all right. Comments, David and then Lisa. Okay, David.

MR. JAMES: I think there are really different scenarios than what you're going to be pulling up on the 6142. It could -- I think if you

looked at the case and back-calculated the limits, like you did for 10 C.F.R. 61 itself, that you would find some -- be able to have much higher allowances for activity within that package, or within that excavation.

I'm kind of looking at the rest of it as well. In terms of moving away from the factor of ten, we concur with that, especially as it applies to the homogeneous waste types. I'm not sure that I'm totally on the mark here, so I pass.

MS. ADELSTEIN: Lisa.

MS. EDWARDS: May I first ask Christianne to restate just briefly the comments she just made?

MS. ADELSTEIN: Can you restate the question a little bit more precisely?

MS. D'ARRIGO: Could you, instead of saying, at least for this round, 6142 and 6110, just summarize what that means?

MS. EDWARDS: Sure, certainly. I'm sorry for slipping into the numbers, and this question, I don't want to belabor the point. But we were about to skip over question four entirely, because it is so closely related to the question we just discussed, that a lot of the discussion we just had is relevant to four.

So before skipping over this Question No. 4 entirely, they're very similar questions, except that the previous one asked essentially what concentrations do we imagine that an intruder encounters when we envision an intruder scenario for the -- and again at 6142? That's the performance objective for protection of an individual against inadvertent intrusion.

MS. ADELSTEIN: Okay. So it's not part of that question. I'm trying to understand as you go. Go ahead.

DR. RIDGE: The unique waste streams rulemaking will specify that for unique waste streams that an intruder has done, and some concentration of waste needs to be assumed. Do we assume that the intruder hits the average of the trench, the average of a package?

That's the same thing this question number four is asking. The difference is that Question No. 4 is asking with respect to waste classification, because there are two pillars here, as you might have it, for protecting the intruder.

One is that you show that the waste classification requirements have been met, the waste classification and segregation requirements as they

stand in the rule now are met. So essentially, if you say it's Class A waste, it's really Class A waste. You have to show that.

You also, if the unique waste streams rulemaking goes ahead in the proposed rule, there's going to be a requirement that you do an intruder analysis to show protection of an individual against an inadvertent intrusion for that performance objective, the 6142 performance objective for protecting the individual against an inadvertent intrusion.

So my question, you know, we have these two related questions, and they're so close to related that we almost moved on without even discussing this one, saying that the discussions are the same.

So the question is, is there a difference or are they identical? Do we always say if we're going for classification purposes to average over a package, then we assume that an intruder will hit a concentration that you can find in a package, knowing that that concentration may be higher than the trench average.

So are these questions identical, or are they different? Is it two different questions? Can you assume one thing for the intruder in the intruder

analysis and a different volume for waste classification. You know, it could be something that doesn't bear any more discussion. But my question is are those two questions identical or not?

MS. ADELSTEIN: Okay, okay. Lisa and then Diane. Thank you.

MS. EDWARDS: Well, I do think that there is at least always a tie between classification and the whole trench volume issue. I don't think you can ever completely separate those two, because they're tied and you're doing classification to protect the intruder over time.

I still get a sense from our discussion that we have this scenario in mind, and a heavy emphasis on some kind of discrete item being encountered within a package. I think the way I would bound this is first of all, for inadvertent intrusion, it means that somebody is encountering waste or something different in the soil that they don't realize they are, and whether we have unpredictable human events that people decide they want to live in the middle of the desert or wherever the disposal site is or not.

If waste is varied in such a manner that it is identifiable, it presumes that people will

investigate what is different about this before continuing their actions. To address a little bit of Diane's point earlier, it is true that there is some amount of Class A waste that is close to the Class A limit.

But in all instances that I am aware of, it is varied in a fashion that is different than the lower activity Class A waste and does in fact have identifiable barriers that are in place for -- through discount sealed sources, John, would be in place and recognizable for longer than the short-lived radionuclides would be present.

I think all of that has to factor in, and we have to be careful how we handle those two things. So you can't like take part of the scenario and not the other part. You have to think about first of all, how do I get an inadvertent intruder? If you're going to make waste class limits for that inadvertent intruder, you have to make sure you're in a disposal environment that exposes an inadvertent intruder to short-lived radionuclides.

If you don't have a scenario where someone can inadvertently intrude, in other words, not realize they're hitting something different, I would submit to you they're no longer an inadvertent intruder.

They're an aware intruder.

And we just quite frankly keep records for longer than 100 years. We keep going back to our same houses in the same historical sites, and we're able to take records a long ways back. I don't think the 100 years is reasonable to assume somebody stumbles upon a disposal site and doesn't know, or doesn't have the ability to find out there was a disposal site there.

MS. ADELSTEIN: Okay, okay. Diane.

MS. D'ARRIGO: I would say the opposite, that we've got climate change. We don't know what's going to happen in the desert. We've also had radioactive waste sites that have been proposed in every kind of location around the country, and had, you know, if those were to open.

We've also got a history of radioactively contaminated sites, albeit they, you know, weren't licensed labeled radioactive waste sites. But we have lost radioactive waste sites, and they turn up later. So, and that's happened with hazardous waste. Look at Love Canal.

So there are examples where you could have the records lost, depending on if it's an A, a B, a C, you know, how long you're requiring institutional controls. So I think that has to be taken into

consideration, and that shouldn't just be assumed, that oh, it's out in the desert. Nobody would ever move there. I really, you know, I think that's a policy question that does need to be debated, as was mentioned earlier.

Then my other concern, where I originally raised my card, is that you're making distinction between the two questions, and from my angle, I'm trying to understand --

It looks like what we're going toward here potentially is how much processing needs to be done in order to enable waste to go into a disposal site, and how much tracking do we have to keep in the disposal site and how much containerization, how much -- how difficult it has to be for even an inadvertent intruder, and then of course I'm concerned about migration leakage, which isn't the controlling limiter.

I'm worried about hot spots. I'm worried about, you know, how much -- by making rules about what's going to be disposed, what's the ramification of how much more processing needs to be done, and that from a public perspective, the less handling and management -- the less handling and moving of this material, I think is probably the better for the

public.

We don't want just to meet a criteria here to have to go do a bunch of other steps somewhere else, and truck this stuff back and forth across the country. So that's a few different thoughts I have on these questions.

MS. ADELSTEIN: Okay. Are you getting what you need so far, and James, you're responding to that? Well, let me just ask. Christianne, did that, did you get what you needed on that or are you getting some additional -- okay. Go on James.

DR. RIDGE: They're all good comments. I think the question I'm asking might be something that you might not necessarily have an opinion on at the spur of the moment. So we can move on from that.

MS. ADELSTEIN: Okay. James.

MR. KENNEDY: Just a related point hopefully, and that is this issue of waste classification is something that the generator does. Analyzing, doing a site-specific intruder analysis would be something that the disposal facility operator does. They're two different things.

The generator is the one that deals with a container; a disposal facility operator is one that deals with the trench. Ideally, there would be a one-

to-one correspondence in terms of safety. But I don't think there is anymore.

So you know, right now, we have the waste classification system, that generators are required to demonstrate and document that they meet a certain waste class when they ship it. So I think that's what in part distinguishes that question from the earlier discussion of the, you know, analyzing over the trench.

I'm not sure how that fits into things, but that's a consideration. Just the fact is there's a requirement that generators have to classify waste, and they do it over container.

MS. ADELSTEIN: Okay. Mark, and oh I -- okay, good. Mark.

MR. LEWIS: Yes. I guess I just want to add one more clarification to that. You said the generator classifies the waste, but not in every case. Obviously, 10 C.F.R. Appendix G says that you can go to a processor, and a processor can, you know, modify the waste form and then he classifies it.

MR. KENNEDY: Yes, that's correct.

MR. LEWIS: And again, the whole idea behind that originally was that there may be generators out there that are not capable of either

being able to process their waste and make it suitable for shallow land disposal.

(Off mic comment.)

MR. LEWIS: Okay.

MS. ADELSTEIN: Okay. Any other comments regarding Question 4 before we move on? Okay. So we're onto Question 5. Comments, questions, clarification? Okay, David.

MR. JAMES: Okay. I guess it --

MS. ADELSTEIN: Move closer to the mic, David.

MR. JAMES: Yes. It's been our position for the last couple of years now that the factor of ten rule is really unnecessary for mixable components within a package, that once these materials are put into the package, basically and they're mixed, actually once they're in the package, the mixture itself really can't be separated, one part from the other.

No matter what you do to alter that package, you end up mixing the material more and more. But -- and once it's mixed, whether we've got some, a few cubic feet of high Class C waste is put in with a larger volume of very low level waste. The bottom line is what's in the container defines the class. It

doesn't -- and it isn't going to look at any different to an intruder, isn't going to look any different in the disposal site, whether there was a factor of ten rule applied or not.

Most of the material that's going into it in any case is already destined for that same disposal site. Depending on how they operate, it can all go into exactly the same trench. So the benefit that's gained from that factor of ten is hard to conceive.

I think the biggest effect of it is that certain portions of the waste get orphaned out into a non-disposal configuration.

MS. ADELSTEIN: Okay.

MR. JAMES: I think that covers my opening here.

MS. ADELSTEIN: Okay, your opening? All right. Other comments, responses to the question?

MR. LEWIS: Yes. I'll just add to that just a little bit, nothing different than what David said, other than a clarification, I guess. The whole objective of 10 C.F.R. 61 was to make sure the final waste form that goes into the disposal site meets the performance objectives of the site.

So how it got that way in order to meet the criteria for the disposal site shouldn't make any

difference whatsoever. So this factor of ten and the 1.5, again clearly adds no value when you look at the final form that goes into the disposal site and being able to meet the performance objectives.

And it wouldn't just be the factor of ten in the Rule 1.5. There's lots of things that if you look at the final waste form goes on the site, meeting the performance objectives. You know, again, you can even expand that into -- you don't even need a waste classification system at all.

But certainly, if you're going to have a waste classification, the factor of ten and the 1.5 really doesn't make any difference. You can process, utilities process all the time. They ma have one waste holding tank where they're collecting waste resins from all over the plant into one tank and mixing it all up, and then they do their waste classification.

Another plant may be designed so that you've got five or six different tanks, and they collect it in those tanks and then they check each one. So what's it make a difference whether it's done at the plant by the plant folks, or it's done by a processor intermediately? You know, the final product is going to look exactly the same when it goes to the

disposal site and meet the same performance objectives.

MS. ADELSTEIN: Okay. All right, thank you. David, do you have your card up? You don't have any other -- who else wants to comment on this? Yes, John. I'm sorry. I didn't see you. Okay.

DR. COCHRAN: I just wanted to make sure we're all talking the same thing here. So the factor of ten for mixing similar homogeneous waste types, the Commission has agreed that will be removed. However, there's still a factor of ten in there for the non-gamma emitters and the factor of 1.5 for the gamma emitters for individual pieces. That's really what the question's about.

My memory is that one of the other reasons the BTP was put in place was so that all the states and the NRC had a firm boundary for GTCC, right? So if you take away the factor of 1.5, right, you might take a little bit of GTCC, I mean what you might call GTCC, and mix it in with a lot of Class A, right.

So you don't know what the upper boundary, the boundary is for GTCC, because you can dilute it in a large container. So this factor of 1.5 and the factor of ten put a firm boundary on GTCC. That way, you know that there can't be anything in a container

that's more than 1-1/2 times the Class C limit, all right.

So I've got a Class C limit. So in theory, I could work a package up to the Class C limit. I know because of this rule, nothing in the package is more than 1-1/2 times the Class C limit. So it puts a firm boundary on the Class C GTCC boundary.

So I'm just repeating some of what was said about why the BTP was put in place, and then asking, you know, whether or not we think we should relax these rules, and if so, what's a good basis for relaxing the rule?

MS. ADELSTEIN: Okay. John and then Earl.

MR. LEPERE: I guess I'm just going to add that we kind of mixed apples and oranges here. We were talking about homogeneous and removing the factor of ten, and then went right into ten and 1.5, without making the distinction that that would be for non-homogenous type waste.

I will add that the factor of 1.5, at least in the context of irradiated hardware, very, very rarely comes into play.

MS. ADELSTEIN: All right, Earl.

MR. FORDHAM: I would also run us back to

the idea of a site-specific analysis, because between out at Hanford, I've got one Class C, Class B-C limit for cesium and just down the road, you know, there's another limit down there. So I mean the factor of ten and 1.5, you know, might artificially give us an upper level of the Class C limit.

But in reality, I think you've got to base it more on your, where the site is and the characteristics of the site. So I full support, you know, go ahead and removing it, but basing everything on the site-specific PA.

MS. ADELSTEIN: Okay, all right. Any new feedback?

DR. COCHRAN: I'd just -- I'm sorry. So if we removed it, and we went to the site-specific PA, then we come right back to the some of the earlier discussions, which is how unlucky is my intruder? I mean do we assume that he hits that package you put in there, do we go ahead and do an average across the trench?

So if we take it out, I shouldn't speak for you. I'm a consultant here, so I shouldn't use the "we." But I'll just say it differently. If the factor of 1.5 were removed, then what restrictions would you put on the intruder analysis, to make sure

that there was some upper bound on what goes in the trench?

MR. FORDHAM: Cell bank, basically isotopic bank of what's allowable to go in it, based on volume and waste. You'd basically have an allowable for the site, based on site characteristics.

MS. ADELSTEIN: Okay. I really want to go to David first, if that's okay, given that he's been waiting patiently.

MR. JAMES: I would just say with respect to the factor of 1.5, it really only has -- well, it has potential to come into play in a couple of places. One, it's applied to filters or -- well, we call it cartridge filters, as well as activated hardware and some other types of material.

With respect to cartridge filters, our main activity driver there is cobalt-60, which is our only one. It only has a Class A limit, so it really never comes into play as being particularly classification-controlling. Well, in the context of classification-controlling, as John has defined, that anything that's greater than one percent of the Class A limit is classification-controlling, or contributes to classification.

I'm not sure that we can particularly

abide with that interpretation, but for other materials, cesium comes more into play, although would rarely -- if it is the controlling isotope, not likely in filters and less likely in activated hardware, it could govern the classification of at least some items, and probably overly-restrictive since it's really more of a short-life radionuclide.

In the case of activated hardware, niobium-94 comes into play, because it's a trace element within the elemental composition of stainless steel. That does have the potential of reaching Class C concentrations, and could be extremely limiting in the disposal equation for activated hardware down the line.

One thing to consider with niobium-94 is that it is a, I think, a 30,000 year half life radionuclide, and because it's a Table 1 radionuclide, anything that's greater than the Class A limit is automatically put into intruder-protected disposal.

For mixing it into this particular scenario, I think, is again another oval beach. We really don't need that constraint. Plus niobium-94 is only there as a speculative concentration to begin with.

MS. ADELSTEIN: Okay. Comments or

questions about what was just said?

MS. D'ARRIGO: What was the last thing? What was speculative?

MR. JAMES: The original concentration of niobium-94. It's a trace, so it's a contaminant of the metal, or niobium, the elemental niobium is a contaminant of the original metal.

MS. ADELSTEIN: Okay. Lisa.

MS. EDWARDS: So just to kind of clarify that point but make sure I have it straight, if you have niobium-94 at less than Class A limits, you're already, you know, in the lower limits. If you exceed the Class A limits, you immediately go into Class C, which puts you in a disposal environment that has intruder protection, and really what we have to worry about is the long-term scenario of post-500 years, and that the concentration limits imposed for the Class C limit already take that scenario into account, that long-term scenario.

So imposing a further constraint of the 1.5 between individual parts of the package don't offer any additional protection. What we're looking at is the long-term scenario in this case, and those concentration limits that are defined address that long-term scenario.

MS. ADELSTEIN: Okay. I think I overlooked John. Go ahead.

MR. LEPERE: Well, I was just going to clarify that the definition of classification controlling is just something we pulled from the BTP. We've tried hard to properly interpret the BTP in rewriting it for clarity, and for the presentation today.

But if we missed some things, we'd really like input, right, because you folks are the practitioners who work with it day-to-day. So if we've misinterpreted something in there, you know, we'd really like the feedback. We realize you read the words, but we think you might have read them wrong, and here's the way they're typically interpreted.

But just to point out, classification controlling is just something that we pulled out of the BTP.

MS. ADELSTEIN: Okay. Does that help? All right. Other comments before we move on? Is there a card up that I don't see? John.

MR. LEPERE: John. If I could respond to that. The BTP defines classification-controlling nuclides for the purposes of saying these nuclides --

these are the primary gamma contributors, and these are the non-primary gamma contributors.

But how it is applied is that, you know, at what -- when do you decide that you're going to apply a factor of ten, and when do you decide you're going to apply a factor of 1.5, and it is, in this specific case, which nuclides are controlling classification, and more often than not, in hardware, it's nickel-63. So that's why I said the factor of 1.5 doesn't often come into play.

MS. ADELSTEIN: Other feedback? Okay, Christianne and Jim. James, did you get what you need? Yes, okay. All right. Before we go to Question No. 2, as a matter of clarification, John is -- John Cochran is going to provide some slides and regarding -- that will clarify the question and make things a little more concise, and in the long run, save us some time maybe.

So John, you want to take over from here and stand behind the podium? And after John speaks, I think what we're going to do is take an early break. I'll come back out, but it will be about a ten minute break. So go ahead, John.

DR. COCHRAN: Maybe we'll go ahead.

(Off mic comments.)

DR. COCHRAN: What's the new version of PowerPoint? Is it pptx? Try changing the -- just rename it with an pptx and see if it will open.

MS. ADELSTEIN: Is it up at the top? Okay, while they're working on that, I just wanted to say that we have a public meeting feedback sheet that we would like everyone to complete, and at your break if you could take a look at that, that would be terrific. If you could take a look at it and fill it out before you leave today, we would really love that. Okay.

DR. COCHRAN: We may have to work on this over the break.

MS. ADELSTEIN: Yes. I'm just wondering if we should have a break right now, let you work on it, and then move forward after that. Okay? I heard somebody say sure. I like that decisiveness. Okay. If you could be back in ten minutes please, and thank you for your help and cooperation.

(Whereupon, a short recess was taken.)

MR. LESLIE: I'd like to welcome everyone back from the break. There are a couple of people on the panel that have plane flights that fairly early, and again, that's our goal, is to try to allow them to leave on time, but also fully participate.

As you well know, I have the longer hair compared to Patricia, and so I'm going to run out the rest of the meeting, and I'll try to keep my comments and my interruptions shorter than my hair. And so with that, John, could you take over?

DR. COCHRAN: I'm going to try to do more good than harm. That's the doctor's creed, right? If we could go one slide forward. So we're about ready to talk about the 30 curie limit for encapsulation of sealed sources, and that 30 curie limit comes from an analysis that's presented in the BTP itself.

So I'm going to try to explain that analysis and not take too much time doing it. So again, I hope I do more good than harm. I'm going to back up just a little bit and go just two or three slides over, how the original A, B and C limits were derived, and then go straight from those into the 30 curie limit, because the 30 curie limit's linked back to the original A, B and C analysis.

Could we go one slide ahead or two? Let's go the other way. Come on, there we are. So in derivation of the A, B and C limits, the assumption was that often the future controls knowledge and even recognition is lost for a low level waste disposal site.

The intruder comes out and begins to excavate a basement, and David, that's a good point, that maybe they were using shovels. But I had assumed a backhoe, so that's the photograph we've got here.

Okay, next slide. So he's digging the basement and one of two things happens. He's digging the basement in the old landfill. Either they recognize the hazard, and that's an important point, recognize the hazard, and they back away, and the only dose they get is a discovery dose. They get the dose from discovering that they've got waste here, but no other dose. That gives us our Class B limit.

Forward one slide. Or they're digging in the landfill and maybe it's a little different. But they don't really recognize that there's a hazard there. So they proceed, and they proceed to do two things.

They proceed to build the basement, and that's the construction scenario, and then they would proceed to live there, live in the home, and have a garden and some of the cuttings from the excavation went into the garden. Both of these are chronic exposure scenarios.

Next slide. So here's our basement, and the assumption is that after they've dug the hole for

the basement, some of the waste out of the hole goes around the basement walls and you get some gamma through the basement walls, and some of the waste is going to go in the garden. They're more or less subsistence living out of the garden.

Next slide. So here we are. We've got a simple home. Some of the cuttings from the old landfill are around the basement walls, and some have ended up here in the garden, and they're growing vegetables in the garden. They get dust in the garden. They eat vegetables out of the garden. They're getting gamma shine from the gamma; they're getting some gamma shine in the house, etcetera.

Next slide. So using these scenarios, the NRC back-calculated the concentration that would give the intruder 500 millirem per year, both in construction and ag, and most times it was the ag scenario that was limiting.

Those back-calculated values become your A and your C limits. Now in the EIS process, the NRC took those back-calculated values and liberalized them by a factor of ten, okay, to account for the fact that the markers might work, long-term markers might work.

The probability is probably something less than one. One is kind of conservative, and that not

all of the waste would be at the top of the class limit, Class A or Class C limit. So those are the three reasons that are given in the IS or not given any weighting or anything else, okay. Back-calculated at 500 millirem and reduced by a factor of ten. For the Class C limits, many of the Class A limits are reduced by a factor of ten. Cesium is reduced by a factor of 20, Christianne found, in the EIS. Next slide. So the final --

MS. D'ARRIGO: (off mic) You need to say that in a full sentence --.

DR. COCHRAN: Sure. So NRC ran the scenarios and calculated the dose. Then they back-calculated how much cesium, for example, could I have in the soil that would give me a 500 millirem dose to the intruder, in construction and ag? Okay. So they back-calculated how much cesium would be required in the soil to give that dose.

They then liberalized it by a factor of ten, increased everything by a factor of ten for the Class C limits.

MS. D'ARRIGO: Liberalized it in which way?

DR. COCHRAN: Liberalizing, meaning if the limit was 400 curies per cubic meter, they made it

4,000, okay, a factor of ten. That's a good question, what does liberalized mean because folks can have different interpretations. So the values that were derived in this analysis were the values, are the values you see in Table 1 and Table 2, in 10 C.F.R. 61.55. So these are the Class A, B and C limits that we see in the regulation.

Next slide. Okay. So that was all background. So now what I want to do is to explain the derivation of the 30 curie limit for encapsulation of sealed sources. So here's the question that was before the NRC at the time. We want to set guidance for disposal of highly radioactive discrete items, sealed sources.

We want that guidance to be within the envelope defined in the Part 61 EIS that I just described, which was set for homogeneous source terms, and I'm sorry I didn't be really clear. But we've talked about this in the construction ag scenarios. It's assumed that the waste is uniformly mixed with the clean soil, okay. So the source term is absolutely homogeneous.

Okay. So the NRC said well how am I going to set the standard for a discrete item, given the EIS analysis for a homogeneous source term?

Next slide. So the NRC established a couple of exposure scenarios. Let me just skip them and go on and I'll just explain one of them.

Next slide. So here's what the NRC did in developing that standard. It took cesium at the Class C limit, 4,600 curies per cubic meter, reduced it by a factor of eight, which is what was done in the EIS. This was because of mixing with the clean cover material and the soil between the barrels that reduced it by a factor of eight.

They then reduced it again by a factor of ten, okay. So now you're reduced it by a factor of 80. Okay. I'm going to start with soil that's got 58 curies per cubic meter, cesium-137 in it. I'm going to decay it for 500 years. I'm going to spread it out, so I've got a uniform source term, and the concentration of the source term will be 540 picocuries per cubic meter. I'm sorry, it should be cubic meter. Next slide.

I said okay. If I've got this infinite source term of cesium at 540 picocuries per cubic meter, how long has my intruder got to be here to receive 500 millirem, and the answer was 2,360 hours.

Next slide. The NRC then said if instead of having this uniform homogenous source term all

around the intruder, what if it was a point source? How much cesium could be in my point source, such that if my intruder were still out there for 2,360 hours, he'd receive 500 millirem? The answer was 30 microcuries or 30 curies at time of disposal.

So this is where the 30 curie limit came from that's in the BTP. So I hope that helps to focus the conversation.

MR. LESLIE: Apparently, there's at least one question on this, and Abbie.

MS. CUTHBERTSON: I've been waiting for this all day, so I'm very excited right here.

(Laughter.)

MS. CUTHBERTSON: So I appreciate the safety analysis, and I think one thing that was missing in the past was an acknowledgment of the security concerns associated with disused sealed sources. I agree with Lisa that nuclear energy waste is different from sealed sources, and they're important for different reasons.

Sealed sources are important because they're -- if they're not disposed of properly, then they're out at thousands of sites all over the country, and while they're under regulatory control, there are so many out there that don't need to be at

these sites.

If one was to be discovered and used inappropriately like Goiania or like Delhi or somewhere else, then that would be a problem. And if someone was to intentionally weaponize them, it would be a huge problem that would cost the country many, many billions of dollars and potentially shut down large parts of major urban areas.

I think that this is something that's likely acknowledged. There were two reports that came out recently, that focused on this issue. In August of last year, the interagency and OAS/CRPCPD contributed to the Radiation Source Protection and Security Task Force report, which the NRC was involved in, and that was signed off on by the Secretaries of all the interested federal agencies and by OAS, and presented to the President and Congress.

That said that by far the most significant challenge identified is access to disposal for disused radioactive sources. As I mentioned earlier, there are a number of challenges with regard to access. But what we've seen happening is this 30 curie limit is really being implemented in a way that creates a big gap between 30 curies or actually 10 curies at one site.

We don't know what the future site in Texas limits will be, and we're working with Washington and Hanford and American Ecology to try figure out what the alternative provisions mean there. But I think it shouldn't have to be in the alternative provisions. I think there should be a clear recognition that there is this gap.

For instance, cobalt sources at the one facility that has ten curie limits. They're being treated the same as cesium sources, and cobalt will never be greater than Class C. So when EM is able to open the greater than Class C facility, that's not going to solve this problem.

Cobalt sources are a concern, because there are a number of them that are several thousand curies, several hundred curies. Cesium sources are also a concern that are above 30 curies and below whatever the bottom threshold of GTCC is, and I think that's up to EM to determine how they'll allow for concentration averaging at the future JTCC site.

But it could be a gap of many hundreds of curies, and those two beta gamma-emitting sources are two that are most important, not the important necessarily, but in the group of the most important isotopes of concern from a security standpoint. I

think that there needs to be an acknowledgment that this is happening because of the way the branch technical position is being implemented.

Whether it was meant to be implemented this way or not, this is occurring, and it's creating a gap which is now a much bigger problem than it was in the mid-80's, because we're more concerned about terrorism and about dirty bombs than we were at the time, and these are the sources that would be ideal for those reasons.

If you're looking 100 years or 500 years in the future, it's better to dispose of these responsibly than to allow them to just stay out where they are now. So I wanted to make a few suggestions, or they're actually questions, that I thought might help address this when the BTP is revisited.

I think that I appreciate that there's the inadvertent intruder scenario. I appreciate that there needs to be a certain dose limit at the surface of the container. But why does the volume have to be a 55 gallon drum, and why couldn't it at least be the volume of the device that these sources are in?

Because well another question is why does it have to be a discrete source? Why can't it be multiple sources if it meets the waste acceptance

criteria otherwise? Because some of these devices have multiple sources in them, and you would have to take them to a hot cell, open them up, take them out, put them in one by one into new containers, just to meet the criteria, which seems very laborious.

Also, why does the shielding have to be concrete? Why couldn't it be lead or deplete uranium or titanium or something that allows for more shielding? So I think that it's important to look at all of these things in going forward, because I think those could help, even with the assumptions that are in place now with the inadvertent intruder, and with surface dose rates, and they could help fill this gap.

I don't know if they'll ever be able to fill the entire gap, but I think it's really a concern, and I think this is an opportunity to try to address that. Thanks.

MR. LESLIE: Sure. Earl.

MR. FORDHAM: Her two questions were exactly the two I was going to ask too, is obviously when the '95 BTP came out, the package of choice was a 55 gallon drum. I'm not sure you would say that anymore, rate cases being what they are for a disposal site used. It could be just about anything. We see a lot of B-25 boxes now. So that could change very

easily.

Also, the idea of using led pigs. Our Department of Ecology in Washington, as long as we use a lead pig to act as shielding, is considered a product still. It is not a waste, and we routinely use lead pigs to knock the dose rate down, as part of our packaging for radium sources. So we're already using lead pigs there.

So that would be, that's kind of the angle that we're -- we've asked NSA to actually work through our licensee on trying to bridge this gap out at Hanford, and be able to see if we can take some, at least the in compact sources, and there is thoughts about maybe pursuing, going to our legislature to address the non-compact ones.

MR. LESLIE: Thanks, Earl. David.

MR. JAMES: Yes. Just one question for Abigail. The Department of Energy's been collecting sealed sources for the last several years. What does DOE with a 30 curie cesium source?

MS. CUTHBERTSON: Well, I managed that program, and there basically what occurs is that licensees voluntarily register their sources as disused and unwanted. Then we have come up with threat reduction prioritization criteria, in

coordination with the NRC.

So we apply that to the sources on the list. Then we look at logistical factors like availability of Type B containers that can -- are big enough and shielded enough to take these devices, and then we recover them and at the time, we take title to them and they become owned and DOE-generated. Then we store them and dispose of them in accordance with DOE Order 435.1.

MR. JAMES: Don't they primarily go to the WIPP facility?

MS. CUTHBERTSON: No, not cesium sources.

MR. JAMES: Not cesium sources. So they go into regular landfill disposals on DOE sites?

MS. CUTHBERTSON: Let Marty answer.

MR. LETOURNEAU: NNSS has disposed of a number of those sources.

MR. LESLIE: Microphone.

MR. JAMES: Sorry. Do you dispose of them in landfills in 55 gallon drums or some --

MR. LETOURNEAU: Or it would be 25 boxes.

MR. JAMES: So you do dispose of them in boxes, with fill or with grout or some kind of filler in that container?

MR. LETOURNEAU: Or appropriate shielding.

MR. JAMES: Okay.

MR. LESLIE: That helps me decide who I'm going to go to next. I'm going to go to John and then I'm going to go to Lisa.

DR. COCHRAN: I guess just first, a point of clarification. Are they being disposed of or not, because I just heard that they are being disposed of?

MS. CUTHBERTSON: When they're DOE-owned.

DR. COCHRAN: Okay, DOE title. But the commercial sector ones, okay. So then I've got two questions. If you were queen, okay, what limit would really help you out? Is it 60 curies, is it 600 curies? What would really help you out?

MS. CUTHBERTSON: Well, that's a good question. With cobalt, the limit could be infinite, because it's never going to be greater than Class C, and so -- and there are cobalt sources that are several thousand curies. I mean that's what I would want if I was queen, but I would be willing to settle for less.

(Laughter.)

MS. CUTHBERTSON: And for cesium, it's unclear also how, you know, greater than Class C will be defined exactly. I've heard the number 976. This had 4,600, and so basically everything below what is

determined to be greater than Class C would need a disposal pathway.

DR. COCHRAN: I guess I'm just curious. So if the BTP limits us to 30 curies of cesium for a sealed source, did the GTCC folks pick it up in their inventory above 30 curies? They did not.

MR. LETOURNEAU: No, they can't. Legally, they can't.

DR. COCHRAN: Because the BTP's guidance and not regulation?

MR. LESLIE: Can I remind folks if they're going to join the conversation, to use the microphones.

MR. LETOURNEAU: The greater than Class C EIS looked at anything that met the definition of greater than Class C from commercial sector. It also looked at similar materials that DOE has, which they termed greater than Class C-like. But it did not look at all orphan materials.

MR. LESLIE: James.

MR. KENNEDY: Abbie, I appreciate your thoughtful comments and recommendations, and perhaps it is time to revisit some of the assumptions that went into the original BTP, particularly in light of what's happened since 1995 and 9/11, and all the

security concerns that we have today, particularly for sealed sources.

There were a number of assumptions that were made. They were controversial at the time. Some of the are subjective obviously, and so I think there is possibly room to revisit those. So I appreciate those comments. Just one other comment, and that is for cobalt-60, the limits are imposed by the agreement states, I believe, right, not NRC? It's not in the NRC guidance.

MS. CUTHBERTSON: Well, right. I think I'll -- Earl may know better, but I --

MR. KENNEDY: If that's so, what would you have NRC do, is my question?

MS. CUTHBERTSON: Well, I guess my point is that the way some agreement states, if they're the ones making this determination are implementing it, they're taking the 30 curies across the board for all the isotopes, all the beta gamma-emitting isotopes.

So I think that there should be some kind of recognition that this is happening and a way to look at how it can be addressed, so that if for some reason it has to be 30 curies for cesium chloride, which I hope it doesn't have to be, it's clear that that's not -- cobalt is not the same as cesium

chloride, and you can't make the same assumptions.

MR. LESLIE: Okay and Lisa, I'm sorry. I skipped over you, and then I'll go to Diane.

MS. EDWARDS: I very much appreciated Abbie's comments as well, and I kind of would like to take the same type of thought process that she evoked, related to sealed sources and security issues, when she talked about we don't want to create gaps, where we have orphaned or limited disposal artificially in some way, and apply it to low level waste disposal across the board.

And we have a public policy that says disposal is preferred over storage, and if we start with the premise that one of our objectives is to achieve disposal when it is possible to do so in a safe manner, then we need to approach how we structure our revision to account for that.

So we don't want to create even more gaps than already exist certainly, and perhaps we would like to reduce gaps that are currently in place.

The thing that bothers me about the comment about how unlucky is your intruder, is it challenges; right way it moves you off of what are a reasonable set of assumptions, and moves you into what fantastic scenario can you think of, where if you

extrapolate that scenario out, no matter how fantastic it is.

I could create this situation, that therefore it could be used to justify more restrictive limits, or become the basis for more restrictive limits, which would create further gaps, which is counterproductive to our original policy of wanting to prefer disposal over storage.

So I would encourage us in our deliberations, that although how unlucky does your intruder happen to be must enter the conversation. I'm not sure it has to be the basis of the decisions that are made, and the basis of the constraints that are developed. I think that's all I want to say.

MR. LESLIE: Thanks, Lisa. Diane.

MS. D'ARRIGO: I think collecting the sealed sources is one of the good things that DOE does, and I'm wondering if there's any effort on the part of NRC or whoever else is allowing creation of sealed sources to limit that, because of the problems that we have?

MR. LESLIE: Jim, I'm going to turn to you.

MR. KENNEDY: Diane, this isn't my area, so I can only say a little bit. I do know, for

example, with cesium chloride sources, there's been a whole effort underway, including a National Academy study, to look at replacement of cesium chloride sources, which are quite large.

They made some recommendations. There's been, the Commission's given it a lot of consideration. I think we have a policy statement in the works, and so we've decided, I know at least for that category of sources, which is one of the major ones that we've looked, we will continue to allow their use under certain conditions.

But there's no, at this point, requirement to phase them out. I can't really speak very well to this issue. It's a whole topic unto itself.

MS. D'ARRIGO: Well, then the other thing that I know the steel industry was concerned is that there were a lot of orphaned sealed sources that were out there, and then the NRC made some strides toward having better control over a tenth of them, and I guess that that process is increasing.

But from a public perspective, it seems like preventing more of these things from getting out is an important thing to do. So I'm throwing that into the pot.

MR. KENNEDY: Yes, and just to follow up

on that, I mean yes, that's so, and then on the other side there are lots of beneficial uses for these --

MS. D'ARRIGO: There are, but then they need to be regulated, and what happened is that they were general licensed. So they're all under general license and you don't know where they are. So that's a problem. They need to require specific licenses then.

MR. KENNEDY: Yes, yes.

MR. LESLIE: Sorry. The facilitator's trying to make sure that this is a thought that gets captured, and it's a little beyond what the BTP is about, but it's worthwhile, because I also realize that there have been public meetings on that and perhaps we can provide some more information to you at the end.

I'll work with the people at break to see if I can come back to this at the end of the day. Okay, thanks. So I guess Abbie, I'm going to -- I don't see any other -- oh, David. Abbie, you're saved by David.

MR. JAMES: I just have one comment. This is more in relation to the 30 curie estimate. The 30 curie estimate actually corresponds to the Class B limit for cesium. So if you put that .2 cubic meters

at 30 curies into a Class C mixture of materials, it would disappear in there. There's no distinction between that.

A person could pull out any two cubic feet of it and theoretically it could be higher. So I think that limit only makes sense in a Class A type of facility.

MS. D'ARRIGO: Will you say that one more time?

MR. LESLIE: There's lots of quizzical looks.

MS. D'ARRIGO: No, it was a very good point.

MR. JAMES: I don't know if I can. I have to reconstruct now. The 30 curies of .2 cubic meters corresponds to the Class B limit for cesium, 150 curies per cubic meter. If you had a Class C facility which theoretically had high activity that was greater than 150 curies per cubic meter of that same rate of a nuclide in the trench, or where you dump it, you couldn't distinguish the source from the rest of the material in there.

An intruder could come in and any two cubic feet that you pull out of there could be equal or greater than 150. What I'm saying is that if you

are going to set that as a limit, it really only comes into play in a Class A-B facility, not into a Class C facility.

If you're really looking at Class C disposal or greater than Class C, then it would go up to the Class C limit, for something to be distinguishable.

MR. LESLIE: Okay. John Cochran.

DR. COCHRAN: It's the combination of the curies and then the size that cause the problem. So if you use the upper bound of 100th of a cubic foot, a little smaller than a Coke can, and you put 30 curies in there, and you scale that up, that's 100 and some-thousand curies per cubic meter.

So it's really not just the curies, but one has to look at the concentration of the curies. I think that's why we talked about earlier, that it was accidents with sealed sources that in part triggered the BTP, I think, because of the concern that sealed sources might be in a disposal facility, they might be excavated and be unrecognized.

That's the key point, I think, is that they might be unrecognized.

MR. JAMES: And apparently outside of an intruder-protected facility.

DR. COCHRAN: Well, the fundamental assumption when we talked about that was that when the intruder digs into the disposal facility, you've got one of two pathways. Either that they recognize the hazard, they back away, right. They only get an acute dose, or it's completely unrecognized. Your waste is soil-like, and they proceed with construction and ag.

I'm speaking a little bit for folks who, you know, I'm just trying to put myself in their shoes maybe. The sealed source accidents, Goiania, the one in Egypt, the one in Morocco, all those occurred because there was a lack of recognition of the hazard.

Had they recognized the hazard, people wouldn't have died. But people didn't recognize the hazard. So I think that's a bit of the problem here is recognition.

MS. EDWARDS: But none of those events happened associated with regulated disposal; correct?

DR. COCHRAN: No. In fact all those were in use or, in the case of Goiania, it was a semi-abandoned medical facility.

MS. EDWARDS: Yes. So they were abandoned or they lost control of those things. Those accidents did not occur in the environment that we're talking about.

DR. COCHRAN: They did not, but I think they caused, I think they caused folks who were developing the BTP to think about that in the context of a disposal facility. I'm making a hypothetical there. I don't actually know.

MR. JAMES: I would still say if we take those out of the mix of what we're talking about here, and define them as a discrete or unique source or a unique waste type, most of the issues that I think with the BTP, just kind of slip down the scale.

DR. COCHRAN: Well, yes.

MR. LESLIE: Can I go to James?

MR. KENNEDY: Well, I just want to affirm what was being said, both what John said and what Lisa said, and that is that we understand that the sealed source events back in the 80's, for example, were one of the driving forces for the sealed source scenario that John described earlier. That is, the 2,360 hours with the guy sitting in the chair, as it were.

But you make a good point, and that is that wasn't for a licensed disposal site. That was for abandoned sources, and one could argue that those weren't the appropriate scenarios, that that's too conservative.

I think, you know, one of the bigger

questions here is just exactly what are the appropriate scenarios for these things, and who decides what they are. In the case of the BTP, you know, it was decided by the staff back at the time that they made certain assumptions based on trying to prevent these accidents.

But a baseline assumption was that the likelihood of somebody going into a licensed disposal site was about the same as some of the events that occurred for unlicensed sources that were, I guess, in urban areas. That's a big assumption, I would argue, and maybe something that needs to be looked at again.

MR. LESLIE: Jim, this actually brings up a good point. I mean what the NRC staff is struggling with a bit is there are some really good comments that are coming out today, but that might not -- especially if you have extra material, written material that will really help them hone in on what is the appropriate scenario or the depth of it.

For instance, Abbie if you've got information in terms of addressing your two particular questions, you know. I heard Jim say these are great questions and things that we need to consider. I think we've heard the questions, but I don't know at this point, with the discussion, that they're getting

all of the necessary information to really address it as they go forth with the BTP.

So it's just, and just to remind folks, that this is part of the beginning of the discussion, that the written comment period ends on April 15th. So again, just good discussion, but I think the staff will appreciate any comments in terms of written as well, or specificity here today as well as we go on. Lisa.

MS. EDWARDS: Well, EPRI and NEI will work together to provide you the information that we have. But we do have a document that I think is part of your public record now and in your library for a technical justification for proposed modifications to branch technical position.

But any other information that we have available that we are comfortable, that we have enough technical behind it, we will look to submit that before April 15th. But one of the things is we could talk about one of these issues for much longer than one day, and not get to the end of that issue. It is not possible to solve the problem in the discussions that we're having today.

So I think part of this is just to sound out what are like, how do we -- how big is the bread

box?

MR. LESLIE: Right, right. Okay, good. Good feedback. John.

DR. COCHRAN: Just a thought or two in closing on the sealed source issue. You know, all this was developed strictly in a safety context. I mean there was no thought about national security, about safeguards, and maybe because this is going to be risk-informed, right, we look at the risks and whether or not the controls are commensurate with the risk, this may be an opportunity to now bring security concerns to bear, and particularly when talking about sealed sources

MR. LESLIE: Lisa, do you still have -- no. Okay. No problem. At this point, I'm not seeing anyone else wanting to jump in to address Question No. 2. Staff, have you heard enough or have some good notes? Any other follow-up questions?

(No response.)

MR. LESLIE: Okay. Could I go to the next slide then? All right. We're in the last bin, down to the two final questions, which also probably are going to elicit a fair bit of discussion, based upon comments earlier today.

Can we go to the next slide? We'll start

with Question No. 6 in the *Federal Register* notice, what types of -- what limits on the types of low level waste that can be blended should be specified in a concentration averaging BTP?

Specifically, should blending of cartridge filters in sealed sources to form homogeneous mixtures be addressed in the branch technical position? Does anyone want to start off? Well, there's John quick. John Lepere.

MR. LEPERE: Well, as a matter of fact, I would like to. I think first and foremost, I would very much like to see sealed sources and cartridge filters dealt with in an entirely separate fashion, because they're not the same thing.

That being said, I think we can use clarity in the BTP with regard to dealing with cartridge filters. Obviously, I've got my own little agenda here. There are processes that will allow you to deal with cartridge filters in a manner, solidification in a manner that will achieve homogeneity and meet Class A concentrations.

Averaging of cartridge filters is something that we've been doing, just mathematically averaging and concentration averaging of cartridge filters is something we've been doing successfully

since initiation of the BTP. There's a reasonable argument that cartridge filters, packaged in a container, could be similar in nature to DAW in an intruder scenario.

So there are a number of things that I would like to see clarified in the BTP, and I think John, what you've started doing in terms of dealing with categories of material and what rules you apply, as opposed to activated hardware and cartridge filters, soil-like materials, things like that, is a move in the right direction.

I think we should just expand on that solidification of any waste, when it's done in a manner that achieves homogeneity in the final package, should be recognized more clearly.

MR. LESLIE: Graham and then David.

MR. JOHNSON: Okay. I'll take that same point. I think that filters should be allowed to be handled in a manner similar to DAW. I think that the risk is similar to DAW. The waste form at the time of the intruder scenario is similar to DAW.

I also want to say that we in the nuclear business, particularly at Duke, we spend a lot of time, dose and effort and money, segregating filters based on waste class. If that segregation is really

not needed, it certainly would be helpful, because we spend a lot of time and a substantial amount of dose dealing with filters, probably moreso than anything we deal with.

The multiple times that you handle filters as you are trying to classify them and segregate them is something that is a burden that we would love to see minimized. That's it.

MR. LESLIE: I'll go to David and then Abbie. Microphone.

MR. JAMES: First, I'll agree with John, that sealed sources have no place in the discussion of filters. They're completely different animals in terms of handling and disposal. We've advocated that cartridge filters should be treated like DAW, and as Graham said, they're more similar to DAW than other things.

We also look up on the cartridge filters. There's a very small segment of the overall waste treatment. It only maybe accounts for about five percent of the waste volume, and in comparison they did using the source data that EPRI collected, all of the cartridge filters that were disposed between 2004 and 2007, constituted an activity equivalent to about half of the total of Class A resins that were disposed

of during that period.

So even from an activities standpoint, even though an individual filter can be high in classification because it has very restrictive rules for how it's evaluated and averaged, it still -- there aren't that many of them. They don't count for very much. They don't add much to the disposal site, and they probably don't quite deserve all the attention they're getting.

I think, you know, in summary, or just one additional point that I was trying to think of, I've had the opportunity over the last 20 years or so or the last 30 years almost to do a lot of work with the Japanese. The Japanese, when they opened their first disposal site, was dedicated to DAW and cartridge filters. They split resins out separate.

They always kept that stream together with cartridge filters. I think, you know, from a rational and waste form point of view, that's basically what they are, is DAW.

MR. LESLIE: Before I get to Abbie, David, a question. What is DAW?

MR. JAMES: Dry active waste.

MR. LESLIE: Thanks. Abbie. Then I'm going to go to Mark and then probably Lisa and Graham.

MS. CUTHBERTSON: So I'm not sure what blending of fuel sources is, but I imagine it's one of two things. Either you put an intact sealed source i a pile of dirt, or you break one and mix it in with the dirt or something like that. In the first case, you wouldn't do that, because you would want to shield it and the radioactive dirt or gloves or whatever you have that you're trying to mix it in with or average it over, wouldn't be a good shield.

In the second case, you do have the concern that some day, 500 years in the future, a subsistence farmer will dig in and hit the sealed source exactly. But you have a shorter-term security concern that or a safety concern that it's safer to just keep the source intact, instead of having people have to cut them open and pour them in dirt and mix them all up.

So I don't really think -- I think these things should be addressed through concentration averaging, and looking at different shielding, rather than blending of fuel sources. I'm not sure it's practical or, I guess, practical.

MR. LESLIE: Mark.

MR. LEWIS: Just two independent comments. One is the distinction between homogeneously mixing

and solidifying filters, whereby you now shred a cartridge filter into it, so that it can be mixed homogeneously, versus encapsulating. I mean obviously there's a distinction there, when you come to intruder kind of scenarios. So we certainly need to make sure there's a distinction there.

Abbie, I agree with you. I don't think you want to shred up sources, sealed sources and spread them around. But the filters is a whole different story, since they're more really -- once you get them shredded, they're more like DAW, as David said. So that was one thought.

The other thought that I want to point out, and I don't know that the NRC can do anything about this with the BTP, but regardless of what you've had in the past from the BTP or what you might put in the BTP, it seems like every disposal site that is licensed by an agreement state interprets the requirement for sealed sources and filters differently, from one another.

That makes it very difficult for generators to figure out how to comply with either the NRC BTP classification system, versus the individual disposal site criteria.

MR. LESLIE: I'm going to go to Lisa, then

Diane and then Marty.

MS. EDWARDS: I have a comment, but first I'd like to ask a question.

MR. LESLIE: Sure.

MS. EDWARDS: So the IAEA has a process that is apparently being implemented cross various countries for boreholes, for the disposal of sealed sources, which is a different set of physical -- it's a different physical disposal environment than what is presented in the typical low level waste disposal site. How does that fit into the overall strategy that you envision?

MS. CUTHBERTSON: I'm also familiar with the IAEA's borehole program, and as far as I understand, they haven't actually built any boreholes yet. But they do hope to, to address sealed sources in other countries. I can't speak to different disposal technologies within the U.S., because that's really what EM decides for the DOE sites, and what the states decide for the compact sites.

I think, you know, if other countries develop responsible disposition pathways in them, then I think that's good. But I feel like I can't speak to whether a borehole is better than another type of disposal here.

MS. EDWARDS: I guess my comment is back to filters, and treating filters more like dry active waste. What I would add to David's comment is that there really is no similarity in the waste form or activity content of filters. If you try to compare those to activated metal or to sealed sources.

Really, therefore, no comparison in what their response is in the disposal volume. Filters are physically, chemically and radiologically more like dry active waste, and could be treated in a manner similar to dry active waste.

For instance, limiting the activity averaging for filter over just the filter volume, which is a relatively small volume presumes that 100 years later, this papery-plasticky thing is going to somehow have retained its physical shape, when in fact you might have like the outer shell there.

But you would presume it is going to decompose in a manner similar to other paper products, over 100 years, won't have its physical shape intact any longer. So from a technical basis, I would say that that is part of the reason why it should be treated more like DAW than a discrete item.

MR. LESLIE: Thanks, Lisa. Diane.

MS. D'ARRIGO: I had two questions. One

is on this filters and DAW being the same. Don't the filters have generally more radioactivity, a higher concentration than the DAW? But you're saying that physically, after they're shredded they're very similar physically.

Don't they have a lot more plastic than maybe the DAW? I don't know how much plastic is in the DAW. It's about the same?

(Off mic comment.)

MR. LESLIE: Lisa, mic.

MS. EDWARDS: Plastic was not a good descriptor of filters.

MS. D'ARRIGO: So they don't really have -- I guess I'm concerned, because DAW gets incinerated in Tennessee, right? Isn't that one of the things that happens with it?

MS. EDWARDS: It can be, uh-huh.

MS. D'ARRIGO: Uh-huh, and then are filters being burned there too?

MS. EDWARDS: I don't know the answer to that question. Mark?

MS. D'ARRIGO: Are filters also being burned along with DAW?

MR. LEWIS: There are some -- I'm sorry. There are some that do get incinerated at our Bear

Creek facility, but they're usually very low in concentration. Not your typical ones that, you know, that tend to be the ones that are a problem child, that have real high concentrations.

So the ones that are real low activity typically don't have a metal. they're made for incineration. They're made out of plastic. The ones that John is really talking about are the ones that are, have a steel metal cage around them, and they're paper or fiber filters, and they usually have far more concentration on them than what you have, the ones that we incinerate.

MS. D'ARRIGO: So the, I was also asking how much plastic is in DAW and in incinerable filters.

MR. LEWIS: In DAW, there's a lot of plastic. You know, as you might expect, there's just plastic everywhere. So DAW, dry activated waste, really simply is your trash can full of trash that has some contamination on it. So you're going to end up with lots and lots of plastic.

Filters, in the filters that do get incinerated, there usually is a lot of plastic as part of the cage rather than the metal, whereas the filters that tend to be the more problem child ones, they don't have a whole lot of plastic. They're typically

more metal framed, with paper and fiber inside.

MS. D'ARRIGO: Then I had a second question on this question itself. It says what limits on the types of low level waste that can be blended should be specified in the BTP? So I guess I am hearing about Studsvik's new process, that is pyroprocessing.

It had been pyroprocessing B and C waste and it's still B and C when they're done, and now we're hearing that they can process it and it becomes A. So I'm wanting to know if that's, those are resins. So are they bringing in more Class A resins so that they can be pyroprocessed down to Class A?

MR. LEWIS: First off, the process is not new. It's been, they've been going on for ten years, and in general --

MS. D'ARRIGO: I guess what's new to me is the understanding that it could result in Class A.

MR. LEWIS: Right.

MS. D'ARRIGO: Maybe it's not.

(Off mic comments.)

MR. LEWIS: The method of steam reforming, which is what Studsvik is using, is a process that's been around for a very, very long time, to try to treat organic materials of any one kind or another.

So again, it's a long term process. Studsvik themselves has been in existence for ten years, and been processing resins for a very long time. The original model for that was going to be to process, you know, any kind of resins necessary and be able to ship, as Class B or C material, to the Bonneville site before it closed.

When we no longer had a B and C disposal site to ship to, then it became a little more difficult for them to do lots and lots of volume reduction on those resins, and still be able to maintain a Class A category in order to be able to ship.

But understanding that it, the methodology of steam reforming is not really your stereotypical blending like we've been talking about here, because it's a whole change in chemical form.

I mean you're actually removing all the organics and changing the chemical form that's there. It looks totally different from one another. The process that you're talking about right now, that just recently was in the newspaper, was actually joint venture between Energy Solutions and Studsvik, a LLC company called Semper Safe, and the intention is to be able to take resins prior to processing from sites,

with any kind of waste classification or radionuclides, and be able to blend them in before they process.

Once they're processed, it's a whole change in waste forms. So the final product will be Class A for disposal.

MR. LESLIE: Marty, and then John Cochran.

MR. LETOURNEAU: I wanted to go and jump in here, because this was seeming to be something where I could share some DOE experience, and I think actually with Diane's questions, this is a good segue. Everybody started out by saying oh no, no. We can't blend sealed sources with filters or DAW or something else, and you know, I don't disagree with that.

But let's talk about why we don't do that, and let's talk about how to approach this in terms of what you would say in the BTP to avoid unintended consequences. It's not that we don't do it because those two things are so very different on the face of it; it's that we don't do it because they're going to have to be managed differently. When we look at combining wastes, it has to do with how they're going to be managed.

If they're all going to go to the same disposal facility and be managed the same way, then

you haven't gained yourself anything by separating them. If the end result of putting them all the same container is that yes, you do average over that container, but they're all going to go to the same facility anyway, then that's the more important issue.

Along the same lines is it's more important to look at whether you are mixing reactives with cellulosic material and the problems that that can cause, than things that are of different radionuclide contents.

So if I take an example of a laboratory at Savannah River or even H-Canyon, yes, I've got a lot of DAW coming out of there, and I've got filters coming out of there too.

I'm going to end up sending it all to the E area trenches. I don't save myself anything by saying ooh, these are two separate waste streams, when in fact they have the same materials. They don't have any compatibilities, and it's actually from a safety and cost standpoint and worker protection standpoint easier to consolidate them and accumulate them in one place.

When that drum or box is full, I'm able to attach the inventory that shows everything that went in there, all the characterization information,

radionuclide content, and send it off to the disposal facility.

MR. LESLIE: John Cochran and then John Lepere.

DR. COCHRAN: I'm just going to respond in part to Lisa's question about borehole disposal. I felt the IAEA, as a consultant on the borehole disposal project they called BOSS there, it's specific for CO radioactive sources and not other waste.

It places the waste at a minimum of 30 meters deep in boreholes, doubly-encapsulated in stainless steel. Could be used in arid or wet environments, and it is correct. We've not implemented it anywhere yet. We've tried Ghana and had some problems with it.

But it's a great system. It just hasn't quite, you know, sort of gained traction yet. Then on the U.S. side, the GTCC EIS is now out for review. I went and downloaded that the other day, and the intermediate level borehole disposal options in there, the depth of disposal is greater than 30 meters, and these would be the larger diameter boreholes, and they largely for long-term performance rely on a good geologic setting.

At 30 meters, greater than 30 meters in

both cases, you've eliminated all the near surface human intrusion concerns but for drilling, and then for drilling, you can place a deflector or a cone on the top of the waste, which should last for thousands of year, and elect to prevent even that intrusion scenario from occurring.

But the mere fact that the footprint is so terribly small, if you worry about probability, the probability goes to near zero, because the target becomes so small. But those are both moving ahead, an IAEA system for sealed sources greater than 30 meters, and then in the GTCC EIS there's also a borehole disposal option.

MS. EDWARDS: The reason I brought it up and the reason I find it so interesting is it does impose a very distinct disposal environment for sealed sources that is specific to sealed sources and not applicable to other waste streams.

I think that is a way to inform our own guidance that we're working on here, and keeping in mind that including the sealed source in our set of assumptions of what kind of risks are present, means we're trying to treat it as the same kind of waste stream as the other waste streams in that disposal environment, and it is not.

They should have separate disposal requirements and be treated separately, and the requirements for the other waste streams should be based on the risk of those waste streams.

MR. LESLIE: Thank you, Lisa. John and the David.

MR. LEPERE: Marty, I just wanted to clarify something you brought up before. When you talk about collecting wastes of different types in a single container, quantifying the activity, and then you talked about concentrations, how do you derive the concentrations in the final package, and how does that relate to your waste acceptance criteria?

MR. LETOURNEAU: Well, we're looking at the total content for the drum, and we're going to have the inventory of every piece that went in there, and yes, we're going to average across that drum for everything that's in there. But we're also looking at any specific pieces to ensure that they're not higher than what we would otherwise have said.

MR. LESLIE: David.

MR. JAMES: This is a comment in relation to the treatment of filters as DAW or dry active waste. We're really talking about treating them in the context of the branch technical position, which

identifies dry active waste as fundamentally homogeneous.

I think we would draw that same kind of conclusion, right, to the cartridge filters, that they would be fundamentally homogeneous. It's all a question of perspective, but with dry active waste itself, you need to stretch your imagination just a little bit to see it as homogeneous.

I think the same is true with filters, that when they're all collected together, they are homogeneous. The key thing, I think, from one perspective, can really ascribe it to any one. But they do constitute a very small segment of the overall waste stream, only a few hundred cubic meters out of 28,000 per year, and the activity contribution is again relatively small.

By imposing sort of an arcane set of averaging criteria to them, you end up, besides pushing them up in class, you end up orphaning some parts of them.

MR. LESLIE: Okay. I think people might be getting tired or maybe we've talked about this issue well enough. NRC, Commission, Jim, you ready to move on?

MR. LETOURNEAU: I got one more here.

MR. LESLIE: Oh, sorry Marty.

MR. LETOURNEAU: I'm drilling back through what I just said in my head John, and I think I may have misspoken. I want to make sure that I correct it. We will take the total activity of the total inventory that went into the drum and average it over the drum.

It is possible that there would be things in there that if removed from that drum, would in and of themselves be considered too high of concentration to go into the disposal facility. But because now they are part of that drum, and the total contents of that drum are averaged over, it meets the waste acceptance criteria.

So if I were to pull those hot pieces out, I might have something that would be considered greater than Class C or even transuranic, that otherwise would not be able to go into that facility.

That was kind of what I was trying to clarify, and understand that in the context of commercial reactors, we've got guidance that requires us to consider different waste streams differently when developing scaling factors for things like transuranics and so that's a benefit you have.

MR. LESLIE: Yes. All right. So we're

not quite done yet, but if that's okay, Lisa, David and then John Cochran.

MS. EDWARDS: You know, based upon what you just said, Marty, it brings to mind what the historic treatment of various components have been in irradiated hardware for commercial power plants. I want to just put this on the record, because it's slightly different than what you said earlier John, and I think maybe offline we can develop the concept more fully.

But for purposes of averaging activity, there may be a component that is say 80 feet long. It's one component, and for purposes of packaging efficiency, that component may be chopped into multiple pieces, and all of the pieces are put into a single package.

In the historic interpretation application of the branch technical position, the activity of each individual piece is added together, and it's averaged over the total volume of the original component, as long as all of the pieces of the original component are in that single package.

That is different than what you talked about earlier in your opening presentations, but that is my understanding of how it's been applied, the

branch technical position has been applied in that condition for many, many years, and I just want to be on the record with that.

MR. LESLIE: John, and then Marty.

DR. COCHRAN: I appreciate the point, Lisa. We've read and re-read and re-read again the BTP, and it's good to know what the interpretation has been over the years. I think that may be a little different than what it actually says in the BTP, so it's good to know how it's interpreted. I think that's my only point.

MR. LETOURNEAU: Lisa just triggered one of my pet peeves, so I have to hit on it here. What you end up with, in terms of waste, is very closely related to how you define the work that you're performing, and you have the ability to define that work, such that the waste that you end up with falls into a certain bin or not.

This is not dilution. This is about how you manage your work and how you define your work. We had a guy at Mound that was working on the D&D of a structure, and he went through a building and he cut off the end of -- the contaminated six inches off of the end of every copper pipe and put them in the drum. When he was done, he had a drum of transuranic waste,

because he only took the contaminated end.

If he had taken the other 18 inches of the copper pipe when they all went into the drum, it would not have met transuranic concentrations and it would not have had to go to WIPP. There was a lack of understanding of what waste was being generated and what his job was. He didn't need to leave the other part of the copper pipe. There was nothing preventing him from taking it.

That's something that everybody can understand, when they define the scope of their work. When I take down a building, there's nothing that requires me to divide the rubble up into here's the highly contaminated rubble and the medium contaminated rubble, and here's the clean rubble.

I knock the building down and I say I'm rubblizing a building, and I concentration average over the whole thing after I've removed all the removable contamination and hot spots that I can. This gets really close to this concentration averaging issue.

If I'm defining the waste that it coming out of H-Canyon as being job control waste, then I can take the dry activity waste and the filters and put them all in one place. If I say the filters are

somehow different, then I've created it, two different waste streams.

So there is a lot of leeway and a lot of flexibility in how we define what we generate, such that we don't create problems for ourselves. There's nothing wrong with that, because once it goes into the ground, the ground doesn't care. If it meets the waste acceptance criteria, it's typed to the performance assessment. It's not going to matter.

MR. LESLIE: John Lepere and then John Cochran.

MR. LEPERE: I guess I just want to make the point that if it weren't -- if there didn't exist things that, you know, the extreme circumstances. If I cut that component up and then take the higher piece, then it in and of itself is greater than Class C. But when I look at the entire component, it is not greater than Class C.

If that situation didn't exist, we wouldn't have created the concentration averaging branch technical position in the first place. The reason it was 12 years later or 15 years later, whatever the case might be, was everybody recognized that the guidance that existed created more orphaned materials than was intended. That's why, my

understanding is that the branch technical position was developed.

MR. LESLIE: Well, with that comment and the phrase GTCC, which leads us into the last question, I'm going to move the discussion forward to Question 7 in the *Federal Register* notice, and I think Christianne summarized it quite well earlier, but she has a really long question, and then a shorter one, which is, for example, when should waste be classified?

Again, the background was provided earlier. So John, you want to jump right in on this one?

MR. LEPERE: Well, I guess I'd like a better definition of greater than classy waste than what we necessarily have right now, because the case that we were just talking about, where you know, if I cut the high end off the component, does that now become a federal responsibility, or is that something that should have been managed in a commercial disposal facility?

MR. LESLIE: David and then Marty.

MR. JAMES: I would just say one of the points I've made before, is that the Class C, GTCC, is effectively an artifact of the classification system.

It doesn't really need very much in itself. Even in the 10 C.F.R. 61 EIS, they made the point that it could be disposed of in a near-surface facility like the other stuff, and it's just a matter of giving it appropriate protection and identifying what it is.

The Low Level Waste Policy Amendments Act, which kind of hard wired the classification system, identified it as high level waste. So we're kind of stuck with that sort of conundrum in terms of how we deal with it.

If there are any changes to the classification tables in 10 C.F.R. 61, then you would suspect that there would be a sweep of material that would go over from one side to the other. Ultimately, the averaging criteria, as it's been used for the last -- it's been a year since it's been out, has been to average waste as greater than Class C into a mixture that is, that meets Class C requirements.

It would be our position again that there is no greater than Class C waste until the package is filled, and you've done the classification just prior to disposal and send it out that way. If the mixture is greater than Class C, then it's greater than Class C. Up until that point, you don't really have a position on it.

MR. LESLIE: Martin?

MR. LETOURNEAU: I couldn't say it any better than David and John did, so I'll just pass.

MR. LESLIE: Okay. That gives it right to Jim Kennedy then.

MR. KENNEDY: Well, two comments. One is first the question is dealing with the Commission's SRM of October 13th, which was dealing with the blending issue, and greater than Class C waste that potentially could be blended down to Class B or C or Class A concentrations.

So I would emphasize that fact. The Commission, in their specific SRM and their specific language up there, wasn't addressing hardware. Now maybe we should, but that wasn't the direction that we got from the Commission. I think maybe we should talk more about that.

The other thing is notwithstanding what the regulations say about the point of classification, which is when the waste is shipped for disposal, the Commission is saying, I think they seem to be saying that waste, at least for GTCC or potentially GTCC waste, you need to measure the concentration before it gets down-blended into something else.

That's my interpretation of that.

Notwithstanding what it says in the regulations about when classification is to occur. So I think we need to address that point.

MR. LESLIE: Lisa and then David and then Mark.

MS. EDWARDS: Well, this is a real bag of worms kind of, isn't it? It is my belief that you should not classify any waste prior to it being offered for disposal. In the work that EPRI has done, the research EPRI has done indicates that there is some justification at least for perhaps even classifying it even later, in over a larger volume than a single package.

So that's a little bit of the science and technology. Perhaps the practical implementation of that is that you classify at the package and stop there, because that's a practical approach, okay.

I understand that there are political issues associated with greater than Class C, and some desire to make a statement that will ensure a state that federal responsibility is not being pushed onto the state. I think that's what the Commission's statement was probably alluding to.

While I appreciate that viewpoint, it still comes down to a technical question of when you

classify waste to determine if it's greater than Class C or not. I think it's very difficult to make a scientific argument that it's appropriate to classify this to see if it's greater than Class C at some arbitrary point, before it is packaged for disposal for this group of waste, but maybe not this other group of waste.

Therefore, I would say you classify waste when it is in the disposal package and not before. If the final disposal package is greater than Class C, than it is a federal responsibility. If it is less than greater than Class C, than it is not the federal responsibility for disposal.

It may be more simplification than the Commission is looking for, but I think to do anything beyond that, you're going to try to create something that there's not a scientific basis for, and it's going to be arbitrary and cause more confusion than it resolves.

MR. LESLIE: Oh Jim, you're fine. Okay, Mark and then Marty.

MR. LEWIS: Well actually what Lisa just said is what I was going to try to say. So I'll really make it quick, in the fact that GTCC material sounds like a political issue to me and not really a

technical issue, that in reality you should classify material after it's packaged and after it's ready to go for disposal.

Thus, there are situations where you may end up pre-processing if you were to classify it. It might end up being GTCC. But post-processing, prior to disposal, in preparation for disposal, it wouldn't be. And I don't see, technically I don't see anything wrong with that at all. That's just simply a political issue.

And it sounds like, from what Marty described earlier, that's exactly what they're doing. If they had the pipe ends, it would have been, had to go to WIPP, because it would have been, in the commercial world, GTCC material. But by processing it in some form or fashion, it now makes it acceptable for disposal.

MR. LESLIE: Marty and then Diane.

MR. LETOURNEAU: Yes. Mark and Lisa, I agree 100 percent with both of you. If somebody is going to have to decide who's going to tell the Commission they were wrong. If you follow what they're asking for, what they're directing there, they're running you completely counter to the last parenthetical statement, and it's creating a precedent

that says that waste at the point of generation has a classification, when in fact waste at the point of generation has a characterization, but as we all agree classification happens at the disposal point.

Just to elaborate on the examples that we have one more time, you know, for us the real hard push is not greater than Class C but transuranic, and because of the way the law is set up, if it does not meet the definition of transuranic waste when it reaches the door, it does not go into WIPP. So it has to be greater than 100 nanocuries per gram of transuranics at that point.

If it's not, it doesn't go in the door. Lots of things happen upstream with respect to treatment and pre-processing that change things that did have greater than 100 nanocuries concentration to now not having. Things can also happen that cause things that would otherwise be low level waste to become concentrated, and suddenly would become transuranic waste.

In fact, you can have -- we have a facility in Idaho that takes drums of suspect transuranic waste and takes four low concentrated one and one higher concentrated one and super-compacts them into one drum, and what ends up coming out the

other end can be low level waste.

We have that flexibility, and we need to be very careful not to put ourselves in a box that is creating segregation and consolidation issues where the disposal facility doesn't care.

MR. LESLIE: Thank you, Marty. Lisa, if it's responding right back.

MS. EDWARDS: Yes. I vote for Larry to be the messenger.

(Laughter.)

MR. LESLIE: Lisa. I thought Jim Kennedy put his name tag up.

(Simultaneous speaking.)

MS. EDWARDS: I think there is one other issue that's directly related to this. If we make it so incredibly difficult to dispose of low level waste, and I realize there's people in the room and across the country that are responsible for now storing that waste.

Because of the size of the waste, it's quite burdensome to destroy that waste, and if you're going to have to store it anyway, there comes a point where you would reasonable consider concentrating that waste intentionally to greater than Class C, and there's nothing that prohibits you from doing that.

It may make you frown, but under current guidance and regulatory rules, there is not anything that prevents that from happening.

If I've got to store a whole bunch of waste for a long period of time, I think I'd rather store a really hot golf ball than multiple high integrity containers that require cranes to lift and move around and inspect once a quarter. So there's lots of sides to this discussion, and they need to be considered carefully, because there could be unintended consequences that result from the decisions that are made here.

MR. LESLIE: Thanks, Lisa. John and then Diane.

MR. LEPERE: I guess I'm just going to piggyback on what Lisa was saying. In terms of unintended consequences, I can assure you that if there was a decision that greater than Class C resins became federal responsibility, all you're going to have are greater than Class C resins, okay.

(Laughter.)

MR. LEPERE: Studsvik can take anything and make it into greater than Class C.

MR. LESLIE: Diane.

MS. D'ARRIGO: I'm not sure this fits

right in this category, but I feel like I need to state that some of the -- it's my understanding of how this greater than C became a federal responsibility, was because of concern by members of the public, who were resisting radioactive waste, new low level radioactive waste sites, that the wastes were going to be hazardous a lot longer than the institutional control period for the facilities.

The Sierra Club has a position that anything that's hazardous longer than 100 years should not go into a low level radioactive waste facility that's only got 100 years of institutional control. Then we can debate over what's hazardous and A and B and C and all of that.

But the way, it looks to me from what went on, not that I know all the details, but that this was the push that made Congress have to deal with low level waste again, and they decided, instead of trying to deal with this long-lasting waste versus whatever, that they take the categories that are there, and the one category that's clearly a potential problem for the states is the greater than C.

So they would clarify that greater than Class C would be a federal responsibility. So it wasn't something that the states had to deal with. So

you know, that's how that evolved. I think that evolved because of the categories, the classifications that were already in place.

MR. LESLIE: Thank you, and Jim Kennedy.

MR. KENNEDY: Well, I would just like to affirm that Larry needs to bring this issue up to the Commission, and second what you said earlier.

(Off mic comments.)

MR. KENNEDY: No. But beyond that, earlier in the discussion, I heard like three or four people all say one right after the other, this is not a technical issue at all. You know, you can -- it's just not. But the Commission isn't making a technical decision there, I don't think. They're making a policy decision, a legitimate one I would argue.

So if there are concerns about it, I think it would be good for you all to be specific, and you have raised a few specific issues after you made those initial arguments about the technical issues not being valid. But be specific in your comments. Talk about the consequences. Maybe talk too about the practicalities and the dose consequences of measuring concentrations before they need to be measured, you know, in process and so forth.

If we're going to revisit that, and I

don't know that we will, because we have direction there, but we do want to know what the consequences are two, you know, even how it might be done, because we may have to be done. That is the direction that we have there, and that is measuring concentrations of waste before they're actually required to be measured right now under the regulations.

MR. LESLIE: Diane, do you still have a number?

MS. D'ARRIGO: Yes. I wanted to know if there's ever been any kind of validation or verification on the existing waste sites, be it commercial or Department of Energy, to show that the various dose levels were being met? You know, what kind of verification and validation is there for the 25 millirem limit from the commercial sites or any of the other facilities?

MR. LESLIE: Marty.

MR. LETOURNEAU: What we can show is what we do for environmental monitoring on an annual basis, and what we have from our environmental monitoring, and compare that back to the assumptions and the calculations that we made in our performance assessments.

The direct observations that we make do

show that we're, in the cases where we can do it, that we are within the ranges that we expected to be. Part of the problem is that when we're talking about the actual modeled peak doses out thousands of years, we're so far away from that point that anything that we're observing now is a blip on the time line.

We do have some older burial grounds at Savannah River that were closed in the 70's; they started operating in the 50's. We've done performance assessment work on those facilities. We have a tritium plume underneath that footprint of that facility. Our modeling showed that when that tritium plume gets off site, it would be below drinking water standards and below even action levels.

What our performance assessment said was that it would take less time for that plume to move. So the plume is actually moving slower than what our models showed, and --

MS. D'ARRIGO: Wait. The assessment said it would take more time?

MR. LETOURNEAU: It would take less time, I'm sorry. We thought that the plume, we knew that there would be release. We knew that things would leach out, and in our model, we said okay, it's going to get to the edge of the facility at a certain time.

It's going to be at a certain concentration.

The time frame that we're seeing in reality is slower than what the performance assessment showed, and the concentrations are lower than what the performance assessment showed. So we would say that that shows that we're going to be within the envelope of exposures that we expected.

Now that's only again, a blip on the time line. But you know, that type of environmental monitoring we only have in a few places, but that's what we can rely on right now.

MS. D'ARRIGO: Is that compiled anywhere?

MR. LETOURNEAU: Yes. It' part of the site annual site, annual site environmental report, yes.

MR. LESLIE: Mark.

MR. LEWIS: Diane, I'll just answer your question, yes. I mean we, as Marty said, we've got all sorts of environmental monitoring programs we've put together, and all of those are intended to be able to support routine regular performance assessments that are updated on a routine regular basis, and they're made public, you know, be able to prove that we meet those conditions.

MS. D'ARRIGO: So what about like Maxi

Flats? Does anybody know about that one?

MR. LEWIS: That predated Part 61.

MR. LESLIE: Mark, you said that it predated Part 61. Okay. Earl?

MR. FORDHAM: Yes. Just to speak to the Hanford commercial site, REIS back in '04 did show that we would meet the 25 millirem. In consultation with the NRC, we no longer use the 500 millirem standard. They're now using 100 millirem. It's not really a standard. I'm not sure what you would call it. It's a recommendation, and we come in slightly above that for the on-site intruder. But the off site is at 22 millirem.

We too also, it's kind of a standard protocol now, that would show any kind of a site will have an environmental monitoring program, and we even today meet, you know, the 100 millirem to the public at the fence line, you know.

Ground water is kind of an issue. It is prevalent. Marty alluded to a tritium plume. Hanford's also got a tritium plume, and it's right underneath U.S. Ecology's facility. So it becomes an issue there of trying to show whose tritium atom is that, and we don't have any real documented releases into our ground water below it from trench operations.

MR. LESLIE: All right.

MR. LEWIS: And it's available on our website environmental reports.

MR. LESLIE: I don't see any other name tents up. Diane, did you get -- okay. I didn't mean to make you turn it down, but wow, that's good. I'm impressed. We're ahead of the schedule, which is good, because originally we were going to end the meeting at 5:00. We've got a few more things to do, and those include a period of time for public comments, and then we're going to have Larry come up with some closing comments.

Before he gets up here, I'll have some closing words as well. So at this time, I'm going to turn to again, for the people on the phone, we'll be getting to you just in a few moments.

I've got a couple of cards from a couple of people who want to speak, and I know someone gave me a card this morning who didn't speak up this morning, and I'm going to go to him first and come back to you. Mike Ryan.

DR. RYAN: I just want to thank Larry and the staff for putting on a really good workshop and for all the participants who gave freely of their knowledge and abilities and histories and experiences.

It's really helped capsulize, I think, where the state of low level radioactive waste regulation and practice is in one room at one time.

So it's been a great seminar and the price was right. It was free. Thanks very much, and I'll look forward to seeing you in an ACRS meeting maybe. Thanks.

MR. LESLIE: Thanks, Mike. Tom Majette.

MR. MAJETTE: Thank you. I have four comments. First, to Question No. 5, I'd like to give you an answer that I think was kind of danced round by several of the panelists, but I'm not sure I ever heard it exactly directly, and that's yes.

I do think you can move away from some of these specific quantified directions, because I don't think they're helpful necessarily for protecting the inadvertent intruder, for some of the reasons that I mentioned this morning.

So I think that, and this also goes back to John's comment about his answer to Question No. 3. So yes, I think it is overly-prescriptive and it's not helpful because of that.

That takes me to my second comment about the inadvertent intruder. It sounds like this morning we were almost on the path to creating a fifth

performance objective, the protection of the unlucky inadvertent intruder, which is not only difficult to say; it's difficult to do.

One becomes perplexed by trying to figure out exactly how unlucky is the unlucky inadvertent, and exactly how specific are you going to analyze exactly what it is that he is able to bore into? That, I think, goes to the comments I made earlier.

The solution goes to the notion that you can, I believe, under guidance and consistent with the current regulations, allow for the selection of scenarios, and the use of site-specific analyses, that demonstrate protection of the inadvertent intruder, without being maybe quite so torturous in terms of some of these multiplying factors.

I don't have an scenarios listed in my Subpart C. I mean I think you have a lot of latitude there, and I think being more realistic in selection of scenarios, which the staff did in its SECY-1043. You talked about the current practices at disposal sites.

We're not talking about, and Lisa made this comment, there isn't waste at or near the Class A limit going into trenches and two meters of soil. It's just not happening. So you acknowledge those

practices, and I think going a little further and recognizing those practices, when you select the scenarios, if you do it on a site-specific basis, will allow even more effective protection of an inadvertent intruder, other than trying to figure out what an unlucky inadvertent intruder is.

I imagine if an intruder's living at a Clive, he's already pretty unlucky no matter what he's intruding on. So I just think that that's to me unrealistic.

My third comment is I would like to agree with Lisa about the 100 years. I think that's also unrealistic. I recognize that that's a policy question.

I know Christianne you can't speak for the Commission and Marty can't speak for Congress, and we all have people we can't speak for, but it is still important, even in this guidance context, because it I believe places that much more importance on selecting realistic scenarios.

I mean in the entire history of the low level waste industry, we have never lost a single low level waste disposal site, and I don't think we're going to. Analogies like oh Love Canal are not applicable. Those were intentionally hidden from the

public.

So no one's trying to hide Clive or Barnwell or U.S. Ecology. Those sites are well-known, well-recognized and they will be for a long time. So I think that should be reconsidered in the context of the rule. But I think that overlay is also important in the preparation of your guidance.

Finally, Question No. 7. As I read the SRM on 1043, it's just a one-sentence line from the Commission that says "though shalt not downblend UTCC waste." It doesn't say you have to characterize sooner; it doesn't direct the staff to go work harder to create it sooner. It just, I think, recognizes that if there's a body of waste that has been characterized, that is GTCC, it's not eligible for blending.

I would suggest to you that you say "okay" and leave it at that, or send Larry back to the 17th floor. I don't care. But to me, to try to torture a new time to characterize waste out of that one-sentence paragraph is not what they meant. So I don't think that's the idea. Thank you.

MR. LESLIE: Is Ron Lavera here?

XX He left.

MR. LESLIE: Okay. John Greeves? Scott

Kirk? Is there anyone else in the audience that didn't sign a card that wants to raise a comment or question. Hold on a second. We'll get to the people on the phone in just one second, and if I could have you identify yourself and affiliation, and then --

MR. HARDING: I'm Bryan Harding. I'm with the U.S. Corps of Engineers, and I know that the existing Class B and C disposal facilities have taken reactor pressure vessels, large components that have been concentration averaged for GTCC internals over the entire volume of the package, once the reactor pressure vessel has been pulled out.

In talking with the newest licensed facility and their regulators, they've basically looked at Question 7 here and they've said that if there's greater than Class C internals in those reactor vessels, they want them taken out before they would accept any.

So they are currently interpreting their guidance, that they're not going to allow concentration averaging of greater than Class C into those large activated components.

DR. RIDGE: Is that a change, based on this SRM?

MR. HARDING: No. I believe that's their

policy or actually I'm not sure if it's in there, that administrative code.

MR. LETOURNEAU: They passed a law to say that waste takes on its classification at the time it's generated, and it cannot change.

MR. LESLIE: Anyone else in the audience? Okay. I'm making my way to the people on the phone.

MR. DIXON: George Dixon at DOE. I just wanted to, somebody mentioned that the draft greater than C -- the greater than C EIS is available for public review. So we encourage people to take a look at that. It gets into the various disposal methods and proposed sites, and so the methodology that was used in, you know, determining the waste inventory and other important factors.

MR. LESLIE: Thank you, George. Anyone else on the phone?

MR. SAFER: Yes. This is Don Safer from Tennessee Environmental Council in Nashville, and I just -- I'm not a scientist, so I'll recognize that to begin with. But I think it brings some perspective, and I don't really get, don't understand all the discussion about diluting radiation and concentration averaging in order to make it okay to dispose of radioactivity in less protective manners.

It seems to me totally backwards to what we ought to be doing with radiation, which is taking it and keeping it as concentrated as possible, and then protecting it as much as possible from anything, whether it's the unintended intruder, whether he be lucky or unlucky, or whether it's people that might be living on the planet in 1,000 years or 2,000 years or 200,000 years for that matter, since we're talking about materials that leave an incredibly long legacy.

I think that the whole idea of diluting this stuff and concentrating averaging and throwing into a trench somewhere, and it just befuddles me as to why the industry is not keeping these materials as concentrated as possible, and then finding the very best place to store them, with as much monitoring as possible.

The other observation that I have is that I haven't heard anybody from Tennessee on the phone from the Division of Radiological Health. I'm not sure if they are or they aren't, but it's my understanding from an NRC document that's online from the year 2000.

That's the last year that these documents, these numbers were accumulated or calculated, that Tennessee was responsible for over -- or four or 58.6

percent of the material that went into the three licensed landfills across the nation at that time. That's the low level waste, and that doesn't take into account the bulk survey for release material that went into our landfills in Tennessee. It does not take into account the material that was burned in Tennessee and volume-reduced.

So by my calculation, we took in somewhere close to 75 or 80 percent of the nation's low level waste, and I can't for the life of me figure out why Tennessee isn't part of this discussion, and I look forward to the NRC having a discussion like this on low level waste processing.

I don't think this is being discussed in Tennessee at the level that it needs to be discussed, and you are, you know, we are an agreement state and the NRC is leaving much up to Tennessee. For instance, the plan to bring in 1,000 tons of radioactive waste from Germany, the import license request or has been requested by Energy Solutions, and that material is to be burned in Tennessee at Oak Ridge at Bear Creek.

We're learning from the NRC that they will not consider the safety of this burning of this material, and we're learning from the state of

Tennessee that they don't really care whether it's imported or not, that they'll continue to burn material that's in the U.S.

So we're sort of in a Catch-22, where Tennessee is becoming the world's low level radioactive waste treatment center, and we don't have much recourse in terms of public meetings or hearings on this, and anyway. I'm done, but I appreciate the attention you all have paid to the details today. Thank you.

MR. LESLIE: Thank you, Don. Anyone else on the phone who wants to provide a question or comment?

(No response.)

MR. LESLIE: One last chance for those people on the phone. All right. At this point, I'm going to make a few comments as Larry makes his way. I wanted to identify that we did put a few things on the parking lot, but I think we've covered them. If not, you can certainly correct me. Early in the morning, Abbie talked about the issue of security of sealed sources as something to consider. Abbie, do you think we addressed that in the discussion and in your comments, or is there something --

MS. CUTHBERTSON: Yes, I think it was

addressed, and I'll talk to colleagues and get back to Jim about activity limits, what we would suggest.

MR. LESLIE: And the second item was kind of a theme that came across this morning, and Larry captured it. But there were a lot of comments that are really good comments, and go beyond the BTP but are things that need to be considered. I don't know, Larry, if in your closing comments you're going to talk more about where this is and the BTP is relative to the other things.

But if you can expand upon where those, again, remind the folks where those policy issues might be dealt with, that would be good. Then kind of it was Diane, I think, that you had talked a little bit about wanting some more information on the impact of sealed source generation. I don't think right now --

MS. D'ARRIGO: It wasn't that I wanted more information. I want NRC to connect creating waste with managing disposal and storage.

MR. LESLIE: Okay, all right. All right. I guess I'll turn it over for Larry to have some concluding comments.

MR. CAMPER: Okay. Thank you, Bret. I appreciate that. Let's do the administrative stuff

first, and pick up your comments. April 15th, comment period for providing comments with regards to the nine questions that we had in the *Federal Register* notice. April 15th. This is the address and the docket number that you can refer to for providing those comments.

There's also an individual identified where, who receives those comments. Cindy Bladey, Chief of the Division of Administrative Services at NRC, and then if you have questions about the document that we've put out there or follow-up questions about today, then Maurice is the person to contact. Maurice is our project manager for this particular initiative.

You see Maurice's contact there, email and telephone number. He'll be happy to take your questions, I'm sure, right Murray? So I think when you think back to the extensive nature of some of the comments today and the discussion, you can readily appreciate why the staff would love to have additional comments.

I mean we've got to go away as a staff and analyze what we heard today; it's being transcribed, and by the way, thanks to our transcriptionist for your work today. We've got to analyze that. We've got to analyze the comments, and then we've got to try

to put that all together in some fashion to make some sense hopefully. So comments would be greatly appreciated.

Some of these issues that you've been talking about today are of such a nature that t's better when you can sit down and think about it, and put your comments together in a constructive fashion. So I strongly encourage those comments. Please do that.

I would go back to something i said this morning. You know, we were thinking great thoughts this morning, and I thought as the afternoon progressed, while you still had some great thoughts and observations, you did a very good job of getting back to the central questions that were on the table, you know, the Questions 1 through 9.

From the staff's standpoint, that's greatly helpful to us. We needed that, because that's what we've got to go back now, as I said, and work on. But I would encourage you to keep those higher profile thoughts and great thoughts as we head into the public meeting, for example, out in Phoenix, Arizona, when we talk about Part 61.

I mean you made some very profound observations about Part 61 and how it's put together

currently, and maybe what should be changed or to what degree it should be changed. So that's a perfect forum to raise those questions again. So many of you are going to be going to the waste management symposium meetings. I strongly encourage you, if you can, come to that meeting on Friday.

We'll also be working with our colleagues at DOE that morning. They're talking about their update to 435.1, and then at the end of the day, there will be a panel of DOE and NRC staff to discuss the relationship and the synergy that exists between what they're doing at 435.1 and their process, and what we're looking at in Part 61. So again, it's a great opportunity to intellectualize the issue again big time.

Can we go to that other slide with the table? Bret asked that we sort of touch this again. Obviously, the first one is today. The comment period closes on the branch technical position on the 15th of April. We're going to be briefing the ACRS on the BTP in Rockville in August. That's a public meeting, isn't it? Yes, it's a public meeting.

So there's another opportunity to see the staff briefing the ACRS and to hear the ACRS and waste reaction. Dr. Ryan will be a part of that. So

those meetings are always available for public viewing.

You're going to -- we'll be issuing the draft BTP for public comment in October. So there's another opportunity to react to whatever the staff comes up with after what we've heard today and after what we hear from the ACRS. There will be then a draft put together and an opportunity for public comment.

The Commission specifically wanted us to go the ACRS before we went out for public comment. So you'll be seeing, then, a deliberative process resulting from the staff's actions, as well as consultation and feedback from the ACRS. So that document in October will be prime time for comment, having gone through a rather extensive internal process.

We are going to conduct another public meeting. It's either before or after the low level waste forum meeting. That's the current thinking. So I'm not certain if the document will be out for public comment at the same time we're having the public meeting, or if the public meeting will take place just before it goes out.

I'm not sure. Maurice, do you know the

logistics of that?

(Off mic comment.)

MR. CAMPER: So it should be out for comment at the time we have the public meeting in New Mexico. Okay, and then of course we want to issue the final concentration average in BTP in June of next year.

There are other things going on. I've mentioned the workshop on Part 61. This is the paper that sets forth the five options. That 10061?

PARTICIPANT: 0165.

MR. CAMPER: 0165, okay. That's out there right now, and we'll be discussing that in a public meeting, which follows on the heels of the waste management symposium meeting. We are going to be getting some guidance out. We discussed that earlier in the day with regards to blending, as was directed by the Commission. That happens in March.

There is the volume reduction policy study. One of the things that we discussed in the blending paper was the fact that we felt that as a staff, we needed to update the volume reduction policy statement. The volume reduction policy statement, which was 1981 -- right Jim, '81 -- was just that, volume reduction.

Because at the time, there was a compelling need for the Commission to feel that it wanted to take a policy position that said volume reduction is terribly important. Well since that time, the volume of low level waste in this country has been reduced remarkably.

In fact, in the nuclear power industry, it's on the order of a factor of 25. So the staff feels that that mission has been accomplished very nicely. But what's really important, and we stated this in the paper, was the licensee -- while volume reduction is important and will continue to be important, what licensees should really be doing is using all means possible to manage their waste in a fashion to protect public health and safety.

So we are working to update that policy statement for consideration by the Commission, and that is due to be completed in August, the paper itself. The unique waste stream's rulemaking. The proposed rule is in October of this year. We'll put the draft volume reduction policy statement out for public comment following Commission deliberation on that proposed new policy statement, of course.

We will then issue the Commission paper for the proposed final volume reduction policy

statement in December of '11, and then we would issue the Commission paper with the proposed final unique waste streams rule in October of 2012.

Then we're also obligated to complete the paper for the Commission in December of 2012. This is the one we will have gone out for one year's time, had a number of public meetings, gotten input, and then go back with a recommendation to the Commission, as to what the Commission should consider doing about Part 61.

As I said earlier today, there are five options discussed in that paper. We make it clear in the paper that we'll listen to other options, and I'm sure other options will be raised. At the moment, we have no preconceived idea of what we will recommend to the Commission, nor should we. So that will be a very interesting paper.

You know, to quote the Chinese proverb, may you live in interesting times, this is about the most interesting time in the low level waste policy arena that I can recall probably in the last 25, 30 years for sure, since Part 61 went into effect.

So there's a lot going on. It's very important to keep it all in mind, to weigh in, and to give the staff your thoughts as we work our way

through these various products. So a lot going on simultaneously. Okay. So that's generally the path forward.

Okay. Let me just make a couple of aha observations. One of them I already did. I thought you did a great job today of providing some high profile kinds of considerations. I thought you did an equally good job giving the staff specific things to take away and to work with.

A number of very interesting and challenging topics emerged over the course of the afternoon. The first I heard was this question of what are the assumptions? You know, the BTP is a guidance document. What are the assumptions that exist in the BTP today and why do they exist, and are they the right set of assumptions.

The question of the 100 year scenario got a great deal of attention and discussion, and I think that the 100 year scenario issue, they'll be some things that may fall out of this process and the staff's work that the staff will probably look at and say we may want to go talk to the Commission more about certain policy-type things that emerged over the course of the work that we're doing in the BTP.

I thought the 100 year scenario as a real

possibility was one of those kinds of things the staff should think about in that context.

Sealed sources, and what to do about the 30 curie limitation on cesium-137. Abbie, I thought you did a great job of expressing your concern from the security standpoint. They raise a lot of challenging questions, you know, why 55 gallon drums and why concrete? Why not other shielding materials, and again calling into question some of the assumptions. Are the assumptions the right set of assumptions?

At least I made a note here at the time, it brought me back to your notion about practice and technology. You know, you really ought to be bearing in mind practice and technology. So I think that that's an area where the staff really needs to go back and take a long, hard look at, and I think if we were to find ourselves seriously considering that we ought to do something different in that context, driven by, I forget who said it, but the point's well made. Ever since 9/11, of course, the world changed and our emphasis on security changed dramatically.

Clearly, what we have today in waste disposal is safety-driven. So perhaps it would be one of those issues where we should talk more in the

Commission about, given our interest in security, what might be done there. But I think it's a tremendous issue, and we appreciate all the feedback on that.

The question of GTCC, let me finish up there. Can you put the question up, No. 7, No. 7. Who's got the slide? Casey, put up No. 7. The issue of GTCC got a lot of commentary, and I did feel the love. I did feel the love.

You know, I was reading the words as we were discussing this, and obviously the staff wants to be certain that we carefully explore this issue, because the Commission directed us to, and that in and of itself is enough for the obvious reasons. We will do what we can to address the Commission's concern.

But I was kind of conducting a logic experiment in my mind when we were talking, and I was reading the words. It says "greater than Class C waste is federal responsibility." Yes, it is, by definition, "and should not be made into a state responsibility." Of course not. It can't be. There's a law that says it's a federal responsibility.

Even if the waste has been blended into a lower classification, the process that we focus upon today in our regulatory regime is waste is classified for purposes of disposal. It is not classified until

it is classified for disposal. So in looking at this, I think what the Commission is very concerned about is it wants to make sure that nothing that's taking place today in the process that is used, or in the guidance that exists within the BTP or that would exist within the revised BTP, does anything to create confusion or seems misleading in terms of where that responsibility lies.

Because I think if you look at the words very carefully, by definition that can't change. So I think what's going to be very important for the staff is to go back to the Commission and communicate with them about this particular point, being absolutely certain that nothing that takes place, as we update or modify the BTP in any way, shape or form, confuses that issues, confuses that issue.

I think Tom made a very interesting point about the question of, you know, does the Commission really mean that once something was ever GTCC at some point in the process, it therefore cannot be downblended. That's an interesting, challenging question.

But obviously we process waste, and waste does get lowered in class throughout the processing prior to disposal. So again, I think that we're going

to look very carefully at this as a staff, and make certain that we're addressing what the Commission asked us to do, and in particular I think it's terribly important that the Commission understand, as a result of this effort and any revision to the guidance, that nothing in way confuses or implies in any way, shape or form any change in that responsibility.

So that's a challenge, and the staff will be communicating further with the Commission about it as we work our way through this. Okay. I think they gave us a lot to think about in terms of the question of how to handle the sealed sources, cartridge filters and other waste and so forth. I think there's a lot there we can take a look at.

And again, the idea is to make this document as risk-informed and performance based as possible, to make it more clear and easy to understand, and I thought there was some good thoughts along those lines that might help with that particular objective.

So I would conclude by thanking you very much. I said this morning we have brought together an august panel with tremendous expertise and experience, I think you demonstrated that very clearly today.

I also think the comments offered by the public and by the individuals listening in by telephone were very useful. I think it's been a fantastic workshop, and Dr. Ryan I appreciate your comments. I knew this was going to be a complex, very technical discussion, and I think it's maintained all of our interest all day long and it's been a job well-done, and I'm very glad we conducted the workshop. So thank you for taking part, and I appreciate every one attending. Thank you.

MR. LESLIE: Thanks, Larry, and I've got a few last comments. Again, I want to thank every one for living by those ground rules, because it means Lisa and David are going to make their planes. We appreciate everyone really providing crisp and concise comments.

Just one reminder, that there are meeting evaluation forms at the outside on the table, and I want to thank you for making my first public meeting as a facilitator a breeze. Thanks again.

(Applause.)

(Whereupon, at 4:13 p.m., the meeting was adjourned.)