STATE OF UTAH

BEFORE THE RADIATION CONTROL BOARD

In the Matter of	)
	)
INTERNATIONAL URANIUM (USA) CORP.	)
	)
Revised 11e.(2) Materials License	)
No. UT1900479 Amendment No.2	)
	)
Revised Groundwater Quality	)
Discharge Permit UGW370004	)
(June 13, 2006)	)

RADIATION CONTROL BOARD MEETING

JANUARY 26, 2007

Location: Blanding Arts and Events Center
790 West 200 South
Blanding, Utah 84511-4212

Reporter: Diane W. Flanagan, RPR
Notary Public in and for the State of Utah

A P P E A R A N C E S

RADIATION CONTROL BOARD MEMBERS:

Kent J. Bradford, Chairman
Stephen T. Nelson, Ph.D., Vice Chairman
Elizabeth Goryunova
John T. Thomson, M.D.
Gregory G. Oman
Joseph K. Miner, M.D.
Dianne Nielson, Ph.D, Director of DEQ
Peter A. Jenkins
Joetta Langianese
Patrick D. Cone
Robert S. Pattison
Frank D. DeRosso

ALSO PRESENT:

Fred Nelson, Attorney General's Office
Dane Finerfrock, Executive Secretary
Laura Lockhart, Attorney General's Office
Michael A. Zody, Parsons Behle & Latimer
Robert H. Hughes, Parsons Behle & Latimer
Travis Stills, Energy Minerals Law Center
Brad Bartlett, Energy Minerals Law Center
Craig Jones, Timekeeper

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I N D E X

I N D E X (Continued)

I N D E X (Continued)

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1 P R O C E E D I N G S
2
3 MR. BRADFORD: We're going to begin the
4 meeting of the Radiation Control Board, and we have
5 some important business to conduct. We have a full
6 day's agenda, so we want to begin and move right ahead
7 here.
8 We want to thank the Board members who have
9 taken time out of their schedules to come and to be
10 here and for -- particularly to DEQ who has made the
11 arrangements and logistics that have been somewhat
12 complicated to get us all together here today. So I
13 appreciate everyone's participation there.
14 Our first item on the agenda is approval of
15 the minutes from our December meeting. And so, Board
16 members, hopefully you had a chance to review those.
17 Are there any comments or corrections on the minutes?
18 Not seeing any, our Chair would entertain a
19 motion to approve the minutes. Moved by Dianne
20 Nielson and seconded by Elizabeth Goryunova.
21 Then call for a vote. All in favor of
22 adopting the minutes say aye.
23 BOARD MEMBERS: Aye.
24 MR. BRADFORD: Any opposed? Thank you.
25 Then we will move then into the main matter

1 of the day. And to begin with I'm going to read a
2 statement here that will kind of lay out a plan for
3 the day.
4 I'm Kent Bradford, the Chairman of the Utah
5 Radiation Control Board. This is a formal
6 adjudicative hearing before the board. Board members
7 present -- you can see we have a full quorum today.
8 Fred Nelson at my left is our legal counsel here
9 representing the Board.
10 This proceeding is being held at the request
11 of the Glen Canyon Group of the Utah Chapter of the
12 Sierra Club which filed a request for Agency action,
13 Petition to Intervene, dated July 13, 2006,
14 challenging the Revised 11e.(2) Materials License,
15 No. UT1900479 Amendment No. 2, and the Revised
16 Groundwater Quality Discharge Permit UQW37004, issued
17 to International Uranium Corporation, IUC, by the
18 Executive Secretary of the Board on June 13, 2006.
19 As required by the Utah Radiation Control
20 rules, this hearing is to be conducted as a formal
21 hearing under the Utah Administrative Procedures Act,
22 Title 63, Chapter 46b of the Utah Code. An
23 administrative record has been prepared, and the Board
24 has been provided with the record, prefiled briefs,
25 and prefiled testimony and exhibits from the parties.

1 It is noted that the parties have made
2 evidentiary objections. It is also understood that
3 the parties have agreed the matter may go forward
4 without resolving those objections; however, the Board
5 may later rule on the objections as it sees fit.
6 The parties will be allowed to introduce
7 evidence, examine and cross-examine witnesses, make
8 arguments, and generally participate in the
9 proceedings. Witnesses will be sworn. Comments and
10 questions should be confined to the subject at hand.
11 Comments and questions that are not pertinent to the
12 subject of the hearing will be ruled out of order.
13 Any person testifying at the hearing may be
14 asked questions by members of the Board. A transcript
15 will be prepared following this hearing as provided by
16 the Utah Administrative Procedures Act.
17 The order of procedure and presentation of
18 evidence for the hearing will be as follows: The
19 Sierra Club will have 15 minutes for an opening
20 statement. The Sierra Club will be represented by
21 Travis Stills.
22 IUC and the Executive Secretary will then
23 have 15 minutes for an opening statement allocated as
24 they determine. IUC will be represented by Michael
25 Zody. The Executive Secretary will be represented by

1 Laura Lockhart. They will share in that 15 minutes.
2 The sierra Club will then present the
3 evidence and information in support of its request for
4 Agency action. The Sierra Club will have three hours
5 for presentation and for cross-examination.
6 IUC and the Executive Secretary will then
7 present the information that formed the basis for the
8 amendment and the license and any rebuttal. IUC and
9 the Executive Secretary will have three hours for
10 presentation and cross-examination.
11 If the Sierra Club would like to reserve
12 some of its three hours of time for rebuttal, it may.
13 Rebuttal evidence would then be received from Sierra
14 Club.
15 Sierra Club will have 15 minutes for closing
16 argument, and IUC and the Executive Secretary will
17 have 15 minutes for closing argument allocated between
18 them.
19 After receipt of all evidence and hearing
20 closing argument, the Utah Radiation Control Board
21 will make a decision to either uphold, modify,
22 rescind, or remand to the Executive Secretary the
23 license amendment. A written order will thereafter be
24 issued pursuant to Utah Annotated Code Section
25 63-46b-10.

1 Time will be kept by Craig Jones, and
2 parties will be regularly informed of the time used.
3 With that introduction, I would like to ask
4 the Board members if there are any questions about how
5 we will proceed.
6 Any questions from the parties?
7 MR. ZODY: Where is Mr. Jones, the
8 timekeeper?
9 MR. JONES: Right here.
10 MR. ZODY: Thank you.
11 MR. BRADFORD: I understand Craig has a sign
12 or something he will hold up so that we will be able
13 to see the time remaining. We do need to be strict
14 about our time control today because we have a
15 definite time where we need to end this proceeding. I
16 guess I would ask, do we know exactly what time that
17 is? I understand it's --
18 DR. NIELSON: Mr. Chairman, I understand
19 originally it was to end at 5:00. We were about a
20 half an hour behind schedule, and so I allowed that
21 for additional time.
22 MR. BRADFORD: So no later than 5:30 is what
23 we need to do so --
24 MS. LOCKHART: When we called state
25 aeronautics, they said it would be up to the pilot.

1 Did you work that out with them?
2 DR. NIELSON: That's what we discussed. If
3 there needs to be other arrangements, we'll try to
4 call.
5 MS. LOCKHART: You discussed it with the
6 pilots?
7 DR. NIELSON: Yes.
8 MS. LOCKHART: Oh. If they're okay, then
9 we're fine.
10 MR. BRADFORD: Don't want the pilots to
11 leave without those passengers that need to be on
12 board.
13 MR. CONE: Mr. Chairman?
14 MR. BRADFORD: Yes.
15 MR. CONE: One quick question. Are we
16 required to rule at the end of the day?
17 MR. BRADFORD: No, we are not. My intent --
18 and I hope the time will work such that we will be
19 able to hear the arguments, have sufficient time for
20 the Board to discuss and come to a decision. If
21 that's not the case, if our deliberations and
22 discussions take longer than that or we're not able to
23 complete, then we would end that -- the testimony
24 portion of the hearing, and we could pick up the
25 deliberations and make a decision at our meeting next

1 week, which is our normally scheduled meeting a week
2 from today. If we're able to conclude today, I would
3 expect that the meeting next week would probably be
4 cancelled because there wouldn't be other business
5 that would need to be taken care of.
6 Any questions?
7 Opening statement, then, by Mr. Stills. Oh,
8 excuse me. I need to -- before you give your opening
9 statement, our Vice Chairman, Steve Nelson, would like
10 to make a comment.
11 DR. NELSON: Yeah. I've been a member of
12 this Board for a long time, exceeded only by Dianne's
13 service. As a matter of fact, it would be I believe
14 in June of this year that eight years ago I chaired a
15 public comment hearing related to alternate feed here
16 in Blanding. So I have a long history with this issue
17 and with this Board.
18 About, oh, a little more than a year ago
19 Bill Sinclair had an article in -- op-ed piece in a
20 Sunday edition of the Salt Lake Tribune regarding
21 waste from Japan -- no, ore from Japan, material from
22 Japan. I don't want to put any characterization on
23 it. So I apologize for that slip.
24 And it was a very good piece, and I
25 responded with an op-ed piece, and I want to make the

1 Board aware of it. The title is a little unfortunate.
2 The banner -- and the parties can have a copy too.
3 The banner was just the website from which I was able
4 to Google it and pull it off. But I wanted everybody
5 to be aware that that piece was in the Tribune. It
6 was in the Sunday -- Sunday in November of 2005.
7 Those of you that are interested can read
8 the piece. I tried to be very fair and evenhanded,
9 but I wanted to provide a perspective that I felt had
10 not been provided by Mr. Sinclair.
11 And it is my intent through this hearing to
12 act in fairness to the best of my ability to all
13 parties and also act in the interest -- best interest
14 of the people of the state of Utah.
15 MR. NELSON: Mr. Nelson discussed that with
16 me, and I felt like it was appropriate after talking
17 to him that that be disclosed. If the parties have
18 concern about that, they can, after looking at it,
19 reflect that concern. But that constitutes a
20 disclosure under the State Ethics Act.
21 DR. NELSON: It may also prove that nobody
22 reads the paper anymore.
23 MR. BRADFORD: With that, we'll proceed with
24 the opening statement from the Sierra Club. Thank
25 you.

1 MR. BARTLETT: Good morning, Chairman
2 Bradford. My name is Brad Bartlett. I'm an attorney
3 with Energy Minerals Law Center in Durango, Colorado.
4 With me before the Board this morning is my
5 co-counsel, Mr. Stills, who I think you met up in Salt
6 Lake City. He's also with the Energy Minerals Law
7 Center in Durango, Colorado.
8 Also with us this morning are members of the
9 Glen Canyon Chapter of the Sierra Club.
10 Well, thank you for making the trip to
11 Blanding this morning. We are here today to discuss
12 and argue the merits of the Glen Canyon Group's
13 challenge to the by-products and materials license
14 amendment issued to the International Uranium
15 Corporation, or IUC.
16 Most, if not all, the issues that will be
17 discussed here today are issues of first impression
18 that have never been resolved by this Board or any
19 Utah court. The Glen Canyon Group's challenge is
20 built on documented evidence and arguments already
21 provided to the Board.
22 Due to the tight time frame for this
23 hearing, the Glen Canyon Group will narrow its focus
24 this morning to a number of key issues that we believe
25 go to the heart of our legal challenge. However,

1 should the Board have any questions on points both
2 addressed and not addressed in this morning's
3 testimony, we look forward to fielding question as the
4 Board sees fit.
5 The primary question in most of your minds
6 this morning is most likely what is this case about.
7 This case is about an outmoded uranium mill that is
8 attempting to operate as a revenue-generating waste
9 disposal facility. Specifically, this case about is
10 IUC mill's use and conversion into a de facto private
11 disposal operation for clean-up of radioactive water
12 sites in other states.
13 Here the radioactive wastes in question are
14 materials from a now bankrupt tantalum and niobium
15 processing facility in Muskogee, Oklahoma. These
16 radioactive materials from Oklahoma known as
17 work-in-process sludges do not even remotely resemble
18 the Colorado plateau ores being milled at White Mesa.
19 Colorado Plateau ores are mined from sandstone
20 formations and transported to the mill for crushing,
21 extraction of uranium.
22 The remaining sandstone and other
23 no-processed wastes are then disposed of as uranium
24 mill tailings. It is the waste from the processing of
25 the ores that are commonly known as uranium mill

1 tailings or by-product materials. And it is these
2 by-product materials, that is, the waste and tailings
3 from ore milling, that require a by-product materials
4 license from the State of Utah.
5 As will be discussed in detail this morning,
6 the radioactive work-in-process sludges from Oklahoma
7 are not ore. Because the Oklahoma materials are not
8 ore, issuance of a by-products material license
9 amendment to IUC was both inappropriate and unlawful.
10 Here the White Mesa Mill was constructed in
11 late 1970s to process the Colorado Plateau ores
12 including those being mined at the Henry Mountains and
13 the LaSalles. The mill's processing and disposal
14 cells, of which there are now three, were neither
15 designed nor constructed to handle anything but mill
16 tailings from Colorado Plateau ores.
17 Here cells 1 and 3 consist of a single sheet
18 of 30-mil polyvinyl chloride, or PVC, liners. The
19 thickness of these liners is equivalent to a stack of
20 10 sheets of paper. I'm going to repeat. The
21 thickness of the liners of the cells at IUC is
22 equivalent to the stack of 10 sheets of paper. That's
23 about the size of my testimony here. And that's not
24 even compressed.
25 Additionally, these paper-thin liners were

1 constructed with no, or highly inadequate, leak
2 detection systems. The single layer of PVC in cells 1
3 and 3 is now almost 30 years old, and there is every
4 indication that the cells are allowing uranium,
5 selenium, and manganese to leak into groundwater. The
6 design of the cells of the White Mesa Mill are a far
7 cry from the multiple layer liners and leak detection
8 system in place at Energy Solutions near Clive, Utah,
9 a facility that was designed to handle materials
10 similar to the work-in-process materials from
11 Oklahoma.
12 Although serious problems with the disposal
13 cells and groundwater constraints have been known by
14 the staff since the year 2000, these ongoing problems
15 were not disclosed, discussed, and/or evaluate in the
16 Safety Evaluation Report on which the issuance of the
17 license amendment was based. Specifically the Safety
18 Evaluation Report failed to analyze and address the
19 current conditions of IUC's cells 1 and 3. The Safety
20 Evaluation Report failed to reveal, analyze, to
21 address current groundwater problems and exceedances
22 of applicable groundwater standards.
23 Lastly, the Safety Evaluation Report failed
24 to determine whether the IUC mill is primarily
25 receiving the Oklahoma waste not for the profitable

1 processing of uranium but instead for the profitable
2 disposal of waste materials. Because of the DRC's
3 failure to address these issues in the Safety
4 Evaluation Report is reversible, the Board must
5 invalidate the license amendment and remand these
6 issues back to the DRC for further consideration,
7 importantly public input. I do want to note that the
8 legal requirements for the safety evaluation were
9 discussed at length in the briefs. I will not going
10 into them right now.
11 This morning the Glen Canyon Group will
12 further substantiate these claims that we just
13 outlined with the direct testimony of DRC's Mr. Loren
14 Morton and the Glen Canyon Group's expert witnesses
15 Mr. Ivan Weber and Mr. Paul Robinson. However, due to
16 time constraints, other issues regarding deficiencies
17 in the Safety Evaluation Report that were raised in
18 Petitioner's brief must rest on the submissions.
19 That said, Mr. Stills, Mr. Weber,
20 Mr. Robinson, and/or myself will be happy to answer
21 any questions you have regarding all of the issues
22 that were raised and addressed in the brief.
23 At the outset I would like to state that the
24 Glen Canyon Group appreciates the work of the Division
25 of Radiation Control's staff on this. We recognize

1 the difficulties inherent in regulating this outmoded
2 facility.
3 Just as a reminder, this is the only uranium
4 mill still operating in the United States. As the
5 Board is no doubt aware, there are currently mass
6 remediation and decontamination projects happening
7 across the West in uranium mills including in this
8 state.
9 Additionally, we'd like to acknowledge at
10 the outset that we do agree with the other parties on
11 several key points. No. 1, we agree with both IUC and
12 the DRC that uranium found in grain water -- excuse
13 me, uranium found in groundwater at the IUC mill
14 exceeds groundwater standards and is trending upward.
15 We agree with the DRC staff's conclusion that the IUC
16 mill and specifically the IUC mill's 30-mil PVC liners
17 which are now 30 years old are now prone to excess
18 leakage.
19 Lastly, we agree with DRC staff's
20 conclusions that the leak detection systems for the
21 paper-thin liners at the IUC mill are grossly
22 inadequate and in some cases nonexistent. Where we
23 appear to disagree is whether these and other problems
24 should have been addressed before issuance of the
25 license amendment and disclosed to the public in the

1 Safety Evaluation Report.
2 We are here today in part to ask the
3 Board -- to ask this Board to give the DRC and the
4 public the opportunity to fully address these
5 problems. Thank you. And I look forward to the
6 presentations today.
7 MR. BRADFORD: Thank you.
8 MR. ZODY: Good morning. My name is Mike
9 Zody. I have with me Rob Hughes from my law firm, an
10 associate in my firm who's been helping me on this
11 case.
12 On behalf of the mill, we are requesting
13 that you uphold the Executive Secretary's approval of
14 the license amendment in this case. The amendment
15 allows up to 32,000 tons of material from the Fansteel
16 site that contains recoverable amounts of uranium.
17 This material is what we call an alternate feed
18 material.
19 The alternate feed program at this mill has
20 been a very positive program. 1.1 million pounds of
21 yellowcake have been recovered from alternate feeds.
22 In today's dollars that represents approximately
23 $80 million on the market. This is a very viable and
24 profitable venture and is good for the local
25 community.

1 It is an extremely safe program. There are
2 strict safety and environmental rules that must be
3 followed at the mill. Any possible emissions are
4 carefully studied and controlled through multiple
5 monitoring and collection systems. The mill has
6 operated for 27 years. There is no proof of any harm
7 to anyone in this community or this community. There
8 is no proof of that. It's a safe facility.
9 There have been significant benefits. The
10 mill provides good jobs and the commerce associated
11 with the mill. This is a positive activity.
12 Let's move on to some of the issues now.
13 And I don't have as much time as I would like, but I
14 will try and keep it within. I think there's a fair
15 amount of confusion and a little misperception about
16 what's going to go on here at this mill when this
17 material comes in.
18 I'm going to move over here. Can everyone
19 hear me okay? I'm trying to simplify this and put it
20 in a diagram that makes sense in my mind the way I've
21 come to understand this in the last few months.
22 When does something become part of the
23 nuclear fuel site? That's a point the Sierra Club has
24 raised. It's once you cross this line right here.
25 Let me explain. You have uranium material which is

1 alternate feed or conventional ore. It goes to the
2 uranium mill. The mill processes it. This material
3 will be milled. There will be yellowcake that will be
4 made. And it will be put in drums that say
5 yellowcake, Fansteel material. It will be sold on the
6 market.
7 On the other side coming out we're going to
8 have tailings going to the uranium tailing cells.
9 This is a very important point, and our experts prove
10 this. This is not waste disposal. We are going to a
11 mill. These tailings resemble uranium mill tailings.
12 The material that is going into this mill
13 was processed once in a very similar process, just
14 like the mill's, through a couple of other methods,
15 but it as uranium still, valuable uranium. So when
16 you run that material that's already been run through
17 a very similar process through this mill, you get
18 uranium mill tailings, not waste disposal like they
19 say. Land disposal rules for waste do not apply.
20 A few more points here. Profit is not
21 relevant. We are under the Atomic Energy Act. The
22 Nuclear Regulatory Commission does not care one whit,
23 and there's no rule that says we care one whit, about
24 how much profit this mill makes when it engages in
25 this activity. It's not relevant. To tie the

1 definition of ore as to whether it's profitable or not
2 makes no sense. It has nothing to do with safety.
3 What we are concerned about is that this
4 activity that generates yellowcake and these tailings
5 is done safely, and we believe we've proven that
6 through the records that have been submitted.
7 The legality of the alternate feed program
8 is well settled. The NRC has adopted a broad
9 definition of ore, and it reads in pertinent part,
10 "Any material from which source material, uranium, is
11 extracted in a licensed uranium mill." That's what's
12 going to happen here. That's why the Atomic Energy
13 Act covers this activity.
14 In the year 2000 the Nuclear Regulatory
15 Commission, the full commission of the Nuclear
16 Regulatory Commission, said this definition of ore
17 that does not look at profit is the legal, valid
18 definition in this country across this whole land.
19 Shortly after that, two years later, Sierra Club
20 challenged that definition before the Nuclear
21 Regulatory Commission in the Molycorp case.
22 Their same arguments they're making here
23 were rejected in that case soundly. That case is
24 binding on them. That's collateral estoppel under the
25 law. What that means is we don't get to keep

1 relitigating this over and over and over. The law
2 says when you have your chance and a fair chance and
3 you lose -- and this position has been clearly
4 established -- we don't get to do it again. So their
5 position has been soundly rejected.
6 Moreover, when Utah became an agreement
7 state for uranium mills, it accepted and adopted the
8 alternate feed program definition of ore. It did that
9 in its application. It is part of Utah's program.
10 That has not been changed at all.
11 So what are the specific rules? When my
12 client submitted its license amendment, it followed
13 the rules that it knew were part of Utah's program.
14 This is a license amendment. I'm going to jump back
15 to that prior point. When you're doing a license
16 amendment, you don't reinvent the wheel. We already
17 know we have a facility, right, and all the
18 protections that it provides.
19 So we look at, and the mill looks and the
20 DRC properly looks at, is there anything new in this
21 material that's different that's going to be outside
22 the envelope of these protections. That's the proper
23 way to look at it. The mill took a hard look, has
24 experts who looked at that who have very detailed
25 knowledge of the mill. They said, no, this will be

1 safely handled by the processes at this mill. That's
2 the key issue.
3 The key provision under Utah law is R31324-3
4 that says various pathways of potential impacts have
5 to be analyzed. We've proven in our papers those were
6 all analyzed in a detailed application.
7 The Executive Secretary engaged in a very
8 thorough review lasting over a year which went to
9 public comment. There was dialogue back and forth,
10 exchange between the Executive Secretary and the mill.
11 An SER was published. Public comments were received
12 and responded to.
13 The Sierra Club's argument that you have to
14 pour everything into this SER, if you don't have every
15 word from every other document in that SCR we have to
16 remand, is not the law. That is an endless do loop.
17 We'll come back here, oh, this isn't in there, send it
18 back, oh, this isn't it. You get to look at the whole
19 record. The whole record is before this Board. That
20 is a false legal argument.
21 Groundwater permit, I want to touch on this
22 briefly. Sierra Club suggests that the status of the
23 groundwater in these tailings cells is an unknown
24 quantity, it wasn't discussed. Groundwater was
25 extensively discussed by the Executive Secretary in

his SER. It was a focus. They had added tin as an element to be monitored in the groundwater.

But the key point is all these issues about the design of the cells were addressed in the groundwater permit that was issued in March 2005. All the work that Loren Morton did led up to the issuance of that permit. That permit says those tailing cells are leaking. We've looked at it. Yeah, they're not current, but they don't have to meet current code. They have to meet DMT, discharge minimization technology. We're not going to make all cells retrofit, dig them up and put a new liner. That's not the law in Utah. They're trying to attack that groundwater permit. The time to attack that has passed. No appeal was filed within 30 days.

The mill strongly disputes the assertion that the cells are leaking. There's a process going on under the groundwater permit to establish the background levels of constituents in the groundwater. The mill recently submitted it's background groundwater quality study report, very extensive, and it says the constituents in this widely variable aquifer -- shallow aquifer -- it's not a drinking water aquifer; its not used for drinking water -- is -- all those constituents are background. It's a

very extensive report. There will be further proceedings on that issue regardless of what happens here. That's on its own path.

In summary, the alternate feed program is a positive activity. It's safe for the community. The relevant rules have been met, and we request that you approve the amendment. Thank you.

MR. BRADFORD: Thank you.

MR. ZODY: May I approach to hand out copies of these?

MR. BRADFORD: (Nods head up and down).

MS. LOCKHART: I'm Laura Lockhart. I'm representing the Executive Secretary. For the most part you can see what we've done in the briefs and the SER and -- the Safety Evaluation Report and the public participation survey -- or summary. We won't be adding a great deal to this. This is -- this is IUC's permit. They're the ones with the most at stake here, and you're going to be hearing more from them than from us.

But briefly I just want to say that we agreed in the course of the state agreement in process to use NRC guidance to determine what was acceptable alternative feed. We did use that guidance. We rejected the Sierra Club's assertion that that

1 guidance was not legal relying on the NRC's decisions
2 interpreting its own governing statute. We feel we
3 applied the guidance appropriately as we described.
4 We did do an NCR Safety Evaluation Report
5 that demonstrated that there was not any significant
6 impact on human health and the environment. And I
7 would agree with Mike that it's not appropriate to
8 turn that document into an encyclopedia of all past
9 actions of the facility. There's a public record.
10 It's available for anyone to look at. The SER
11 referred to the groundwater information, and I think
12 there was plenty of information available for anyone
13 who wanted to look at it.
14 I just also wanted to add that I disagree
15 with Sierra Club's interpretation of Utah
16 Demonstrative Procedures Act. We believe that as of
17 June 12 -- or as of June 16, 2006, there was adequate
18 information in the record to approve this license.
19 But if you come to a different conclusion -- that's
20 what the purpose of this hearing is, to gather
21 additional evidence and to make a decision based on
22 that evidence.
23 That is clearly what this statute requires.
24 There's nothing in the statute that requires either
25 remand to the Executive Secretary or an additional

1 comment period. If you find that there's something
2 that you don't have sufficient information about, a
3 remand to the Executive Secretary would be
4 appropriate. And we would request that we get
5 excellent instructions along with that so we know how
6 to address what the Board needs to be -- whatever the
7 Boards needs to have addressed.
8 Thank you very much.
9 MR. BRADFORD: Now we will ask the Sierra
10 Club to present their witnesses.
11 MR. STILLS: Morning. My name is Travis
12 Stills, an attorney with the Energy Minerals Law
13 Center, representing the Glen Canyon Group of the
14 Sierra Club here today. It's a pleasure to see you
15 again. Again, thank you for making the trip down.
16 Sounds like you had a couple problems getting here,
17 but pleased to see you here and happy to get started.
18 We have a limited amount of time, as we have
19 all repeated today, I think you're aware of. So we'll
20 be bringing oral testimony today that will mostly
21 summarize the written testimony that's been submitted.
22 Because of the quantity of time that we have here I'll
23 be asking the witnesses to summarize what they have
24 provided to you in written form.
25 I hope the folks here, the Board members,

1 have had a chance to review these materials, and we
2 look forward to the presentation of our witnesses
3 today.
4 And right now I'd like to introduce Ivan
5 Weber. Mr. Weber's testimony will help the Board
6 understand the condition of the waste containment
7 systems at the IUC mill and the significance of the
8 fact that ongoing problems with groundwater at the
9 mill were not disclosed in the Safety Evaluation
10 Report.
11 Who's doing the administering of oaths
12 today?
13 MR. NELSON: Would you swear the witness,
14 please.
15 (Witness was sworn.)
16 THE WITNESS: Good morning. Please forgive
17 my wheezy asthmatic voice. I'll do my best to speak
18 up.
19 MR. STILLS: Thank you. I think we've got
20 that under control.
21 IVAN WEBER,
22 called as a witness, being first duly sworn,
23 was examined and testified as follows:
24
EXAMINATION
25

1 BY MR. STILLS:
2 Q Good morning, Mr. Weber.
3 A Good morning.
4 Q A few questions to start with. Does your
5 written testimony accurately set out your education
6 and professional experience?
7 A It does.
8 Q Could you please describe your professional
9 experience with waste containment systems?
10 A My professional experience with waste
11 containment systems consists primarily of my work at
12 Kennecott Utah Copper with the environmental
13 engineering projects and its predecessor plant
14 projects group.
15 That included the design, construction,
16 administration as a technical design manager, if you
17 will, on the large Bingham Reservoir reconstruction
18 and on the Arthur Stepback Repository which is a RCRA
19 class depository.
20 Q Do you believe that your experience at
21 Kennecott allows you to recognize containment problems
22 with the waste containment systems at the IUC mill?
23 MR. ZODY: Objection. Leading.
24 A May I answer?
25 Q Yes.

1 MR. STILLS: And, again, I believe with our
2 short amount of time -- courtroom procedures will
3 adhere to the proper recognition of what is evidence,
4 but I believe what we're doing here is summarizing
5 what has been introduced as written testimony. So I
6 believe this kind of question is appropriate.
7 MR. BRADFORD: Go ahead with the question.
8 MR. STILLS: Thank you.
9 Q (By MR. STILLS) If I can just repeat that
10 question. Do you believe your experience at Kennecott
11 allows you to recognize potential problems with the
12 waste containment systems at the IUC mill?
13 A Yes, it does. Excuse me. The Kennecott
14 facilities represented the best effort of a major
15 mining-related industry. Pardon me.
16 Q If you would like to take a second and have
17 a drink of the water.
18 A I'll be through it in just a second. Thank
19 you.
20 The facilities represented not just state of
21 the art but the state of what industry expects waste
22 containment systems to do. Their function was to
23 completely contain, as in zero discharge, storm water,
24 leach water, contaminated fluids in the case of the
25 reservoir, and also the solid wastes that were placed

1 into the RCRA repository, and of course to monitor for
2 any kind of leach agent that may be emanating
3 indicative of leakage, and then to furthermore do
4 monitoring of groundwater in the vicinity of these
5 facilities.
6 Q Could you describe your previous involvement
7 with the IUC mill?
8 A Yes. In 2002 I participated as a volunteer
9 providing expert testimony on an assessment of the
10 waste containment system at IUC. And that was based
11 on just the documents that I could get ahold of at the
12 time.
13 Q And what problems did you recognize during
14 your previous evaluation of the IUC mill's waste
15 containment systems?
16 A Primarily problems with soil preparation
17 below the liner system, the liner membrane itself, the
18 nature of -- I hesitate to call it a leak detection
19 system because it really didn't appear to function
20 that way even as viewed in 2002 -- and then the nature
21 of quality control/quality assurance documentation.
22 There wasn't any, essentially.
23 Q Thank you. What materials did you review
24 for the current proceeding?
25 A I reviewed, of course, the administrative

1 record, the additional DRC documents that I was
2 provided, and then I did an extensive literature
3 search on not just the current state of waste
4 containment science but also the state as it was
5 reflected in about 1980 and ensuing brief period.
6 There was some rapid changes that went on in
7 the industry during that time, partly technological
8 and partly in response to expectations of these
9 containment systems. So I wanted to do a review of
10 just what that looked like.
11 Q And within this review it did confirm the
12 concerns, problems you had identified at the IUC
13 mill's containment facilities?
14 A Yes, it definitely did.
15 Q And your written -- does your written
16 testimony accurately reflect the opinions you reached
17 and the basis of those opinions?
18 A It does.
19 Q And again -- I'll try to stop mentioning the
20 amount of time we have, but since we do have a short
21 amount of time I would like you, please, to focus on
22 and summarize your opinions as they relate to your
23 review of the waste containment system at the IUC
24 mill. What does your current review reveal about the
25 current conditions of the waste containment systems at

1 the IUC mill?
2 A The review indicates a number of points that
3 really jump out at you. One is that the liner system
4 was inadequate from the start. It consisted
5 essentially of that 30-mil membrane that Mr. Bartlett
6 mentioned earlier. And it's manner of placement, it's
7 manner of installation, was destined to be fraught
8 with difficulties from the beginning especially as it
9 relates to the soil bedding condition and the soil
10 cover condition. This is a sort of rocky PVC
11 sandwich, if you will.
12 And it is -- each of the cells covers an
13 area that has to be understood, let's say, in terms of
14 Salt Lake City blocks, about six of them at least for
15 each of these cells. And so the manner of handling
16 soils relative to the membrane is extremely critical.
17 Yes, there is an image that's rather difficult to see.
18 It shows the extent --
19 MR. STILLS: Can the Board members see that
20 image?
21 A So there's the membranes, the soils, the
22 leak detection system or lack thereof, and the
23 groundwater monitoring that goes along with that, and
24 the nature of construction and manufacturing for that
25 matter of the membrane. Quality control/quality

1 assurance documentation is essentially absent from the
2 record. And so these are things that we would have
3 expected the SER to address, and it really is silent
4 on these issues.
5 Q And back to the image again, I think it was
6 kind of flickering back and forth --
7 A Sorry. Yes.
8 Q -- but if you could, point out what are the
9 cells 1 and 3 just for reference so we have a better
10 idea of what we're talking about today as we come back
11 to this.
12 A The cell that looks dark, that's cell 1.
13 That's the upper --
14 Q Hold on that one, if you can, a minute.
15 Could you? Okay. Go ahead.
16 A And it's difficult to see from the ground,
17 of course, the nature of the fluid that's contained,
18 that is, the quantity. But this is a Google Earth
19 image from just a few days ago. Cell 1 appears
20 relatively full which means several tens of feet of
21 fluid in it, presumably. So what's that mean? Well,
22 setting aside the nature of that fluid for a moment
23 and the nature of the fluid that shows up in cell 3,
24 which you can see sort of in the midpoint of the
25 image -- sorry, this is a peculiar piece of software

1 that's making these images bounce around.
2 The impact of this is it puts weight on the
3 membrane. And if you don't have really an
4 accommodating layer of sand or clay or something that
5 does not threaten to penetrate the membrane, then
6 there is risk of leaking. Now, if you visualize that
7 membrane when it came from the factory enough to cover
8 six Salt Lake City blocks, you can visualize that
9 there would be a little bit of a logistical challenge
10 distributing that over the floor of that basin, and I
11 sympathize with the difficulties. It happens on every
12 application Of flexible membrane liners or roofing or
13 anything else like that.
14 You have to roll it out or unfold it and do
15 it in such a way that you don't introduce cracks, and
16 then you have to seam the materials together, the
17 various segments of the membrane sheet that are
18 provided, and make these seams have the integrity of
19 the field of the flexible membrane liner. So it's
20 quite a challenge.
21 Q And you mentioned these are 30-mil PVC
22 liners? About how thick was that again?
23 A Thirty-mil PVC liners. Well, 20-pound bond
24 paper is about the equivalent of eight sheets. That's
25 what amounts to 30 mils, depends on what paper you're

1 using. Typical copy paper is somewhere between eight
2 to 12 sheets.
3 Q Certainly thinner than the paper that's been
4 submitted in this proceeding.
5 A Yes. In the --
6 Q Sorry.
7 A In the typical membrane that's put on roofs
8 and in pond liners -- like if you build a backyard
9 fish pond, you'll almost certainly wind up with a
10 40-mil or 45-mil sheet. And it may not be PVC. PVC
11 has a bit of a checkered past in its application in
12 circumstances, especially where it's exposed to
13 ultraviolet light, biological degradation, puncturing.
14 It allows a lot of vapor to pass through, so it had
15 some problems from the beginning.
16 MR. STILLS: I see some scribbling from our
17 time keeper.
18 Okay. Thanks. It's nice to keep track as
19 we go. I appreciate your help.
20 Q (By MR. STILLS) You referred to a couple of
21 staff memos earlier. Were these the staff memos from
22 the year 2000 which were attached to the Glen Canyon
23 Group's opening briefs as Exhibits 1 and 2?
24 A Those are the ones, yes.
25 Q And you had first received those to review

1 for this proceeding?
2 A That's correct. I didn't see them until
3 around the 1st of December of 2006.
4 Q Okay. What did these memos tell you about
5 the construction and operation of cells 1 and 3?
6 MR. ZODY: I will make an objection just to
7 this. Those memos say what they say. I don't think
8 we need the witness to read those in this proceeding.
9 MR. BRADFORD: We've noted that objection.
10 Please proceed.
11 MR. ZODY: Thank you.
12 Q (By MR. STILLS) I'll just go ahead and
13 repeat the question. So you reviewed those for this
14 proceeding you said around December. And what did
15 your review of those memos tell you about construction
16 and operation of cells 1 and 3 at the IUC mill?
17 A They provided, first of all, a useful
18 history of the construction of the cells, more detail
19 than I've been able to obtain elsewhere in the
20 administrative record. And they confirmed a great
21 many of the suspicions, at risk of sounding like
22 there's an echo in here. It boils down to soils,
23 membrane, leak detection system, groundwater
24 monitoring, and quality control/quality assurance
25 documentation. Over and over and over those are

1 things that just, as I said, jump out at you.
2 Q Based on all of your review, can you please
3 summarize your view of the current conditions of cells
4 1 and 2 as a waste containment system?
5 A I am --
6 Q That concern 1 and 3. I'm sorry.
7 A One and three, yes. They are almost
8 inevitably inadequate and in need of a great deal of
9 additional evaluation. We are now proposing to place
10 into them materials of considerable toxicity in
11 considerable quantity and the process fluids that are
12 necessary to process them. And we have now to
13 consider their interactions with existing materials in
14 the cells.
15 And so this puts a burden on our
16 decision-making process concerning the adequacy of
17 those lined basins of those waste containment systems.
18 And from here they look highly questionable.
19 Q And do you think there's a likelihood that
20 cells 1 and 3 may be currently leaking?
21 MR. ZODY: Object. Speculation.
22 Q (By MR. STILLS) Based on your review, is it
23 your opinion that it is likely that cells 1 and 2
24 may -- 1 and 3 may be currently leaking?
25 A There is in the record a notice of violation

1 indicating that uranium and manganese and selenium
2 have leaked. And those are materials in the cells,
3 and so this would seem to speak to the probability
4 that there is some kind of leakage taking place.
5 Q And did you review the Safety Evaluation
6 Report?
7 A I did.
8 Q And did your review of the Safety Evaluation
9 Report provide any indication that there may be
10 problems with these waste containment systems?
11 A The Safety Evaluation Report was more or
12 less silent on the issues that I've enumerated. And
13 this is somewhat anomalous in view of the existence of
14 a critical appraisal within DRC staff literature that
15 would be quite adequate in terms of the cells.
16 Q So in your opinion, should new contaminants
17 be added to these waste containment systems in their
18 current condition?
19 A I would strongly recommend against adding
20 additional materials without a great deal more
21 scientific appraisal, and there needs to be some kind
22 of strategy associated with that of course. But the
23 short answer is no.
24 Q And based on your experience working at
25 Kennecott, do technologies exist to determine whether

1 a waste containment facility is leaking?
2 A Well, yes, there are several technologies.
3 Most of them take quite a lot of time and money.
4 There is one that uses electrical conductivity to
5 measure in a gross sort of way whether there's leakage
6 or not, and that might be mobilized in a short period
7 of time and relatively inexpensively. A mechanical
8 integrity test it's sometimes called, electrical
9 conductivity test sometimes also.
10 Q If I may understand, you put an electrical
11 charge in the cell?
12 A Right.
13 Q You put --
14 A A probe below.
15 Q -- a probe below.
16 A And if the light goes on, it leaks.
17 Q And if there's conductivity across, you've
18 got a reason to know that it's moving across what's
19 supposed to have been a sealed barrier.
20 A Right.
21 Q Very simple, very straightforward.
22 A Right.
23 Q Were mechanical integrity tests commonly
24 used at Kennecott to assess whether a liner may have
25 failed?

1 MR. ZODY: Objection to leading. I'll
2 reserve objection. Thank you.
3 MR. BRADFORD: Noted.
4 A I know of one application of that specific
5 approach. The membranes that were installed in the
6 Bingham Reservoir and in the repository that I
7 mentioned had electrically conductive underlayers, and
8 so it's kind of counterpart to that technology that
9 was built in, and so that was used for the
10 construction quality control.
11 But, yes, we did use that kind of technology
12 when we absolutely had to, but we didn't have much
13 need for it.
14 MR. STILLS: Again, as we go through the
15 day, we won't be able to cover everything that we
16 submitted in our briefs. I hope you'll find that
17 those briefs were thorough, and we appreciate your
18 questions throughout the day as you see fit.
19 I think I'm finished with my direct
20 questioning of Mr. Weber.
21 MR. BRADFORD: IUC will be asked to give
22 cross-examination questions here.
23 EXAMINATION
24 BY MR. ZODY:
25 Q Good morning, Mr. Weber.

1 A Good morning, Mr. Zody.
2 Q Mr. Weber, you've given a lot of opinions
3 about a lot of things here today, about engineering,
4 design, tailing cells, kind of other elements. I'd
5 like to explore your background just a little bit
6 more. Are you an engineer?
7 A No.
8 Q Are you a registered professional engineer?
9 A No, I'm not.
10 Q And you've never designed a tailing cell,
11 have you?
12 A That's correct.
13 Q You've never designed any impoundment, have
14 you, any waste storage impoundment?
15 A I participated in a team that designed a --
16 Q There were engineers --
17 A That's right.
18 Q There were engineers who did the design. Is
19 that correct?
20 A That's right.
21 Q You're not a civil engineer. Is that
22 correct?
23 A That's right.
24 Q You are not a toxicologist?
25 A Right.

1 Q Nor a risk assessor?
2 A That's correct.
3 Q Nor a chemist?
4 A That's correct.
5 Q In your deposition you indicated that you do
6 not believe you're an expert in the design of a
7 tailing system. Correct?
8 A I still believe that.
9 Q At Kennecott you were on a team of
10 employees. Correct?
11 A That is correct.
12 Q Actually you didn't work directly for
13 Kennecott, did you?
14 A I was a contract employee, as were almost
15 all the other members of the team.
16 Q And there were engineers on the Kennecott
17 team?
18 A Oh, yes.
19 Q And Kennecott hired out and contracted with
20 consulting firms to prepare its design documents?
21 A No. We designed in-house.
22 Q As I recall, in your deposition you said one
23 of your primary roles was to edit and summarize
24 reports prepared by -- sections of reports prepared by
25 other people. Is that correct?

1 A That was one of my roles, yes.
2 Q And so there were technical specialists who
3 prepared the other parts of these reports, you would
4 review that, and then prepare the summary?
5 A I did that for many of the reports, yes.
6 Q In the past five years you've been
7 self-employed and semiretired. And you are a green
8 building and sustainable development consultant. Is
9 that correct?
10 A That's right.
11 Q You're not offering any opinions on those
12 areas today, are you?
13 A Indirectly.
14 Q You're not holding yourself out to the
15 people who you are asking to hire you as someone who
16 is an expert in design and the performance of tailing
17 cells, are you?
18 A Of tailing cells, that's right.
19 Q You indicate there's certain information
20 that's not in the record to allow certain conclusions
21 to be made. Correct?
22 A In the administrative record you mean?
23 Q Yes.
24 A That's correct.
25 Q In your deposition I went through and tried

1 to understand the records that you had reviewed
2 regarding the design and construction of this -- the
3 tailing cells at this site. Do you recall that?
4 A I do.
5 Q And you conceded you didn't have all of
6 those documents, didn't you?
7 A I don't follow the question. I'm sorry.
8 Q You don't have the documents regarding
9 design and construction of the tailing cells, do you?
10 A They're not in the administrative record, so
11 I don't have them.
12 Q Okay. Do you think it would be important to
13 review those before you provide an opinion about the
14 design and construction of the tailing cells?
15 A I reviewed the information that I had.
16 Q Fair enough. In your deposition you
17 indicated that you're not familiar with the design and
18 engineering specifications imposed by the NRC on this
19 facility, are you?
20 A I've not seen them.
21 Q So you don't even know what the rules were
22 that this facility had to follow at the time it built
23 the tailings cells, do you?
24 A I accept that.
25 Q And you don't know what the standards were

1 for design or construction procedures for quality
2 control or quality assurance in the early 1980s that
3 applied to this facility, do you?
4 A Not specifically this facility.
5 Q So if I'm right, then, you don't know the
6 rules that apply to the facility, you haven't reviewed
7 all the records, yet you're saying this facility
8 didn't meet the rules, basically.
9 A That's right.
10 Q In this case, as I understand it, your
11 concern is with the tailing cells primarily. And I
12 asked you in your deposition if that concern was based
13 upon any specific safety issue associated with the
14 handling of the Fansteel tailing materials, and you
15 said no. Do you recall that?
16 A I do recall.
17 Q So your concern is directed to the facility
18 as a whole, not the license amendment at issue. Do
19 you agree?
20 A Not completely.
21 Q Are you aware that a very extensive and
22 detailed process went on to study these tailings cells
23 from the year 2000 to March 2005 when the groundwater
24 permit was issued?
25 A I'm aware of the part of that study that's

1 in the administrative record and in the additional DRC
2 staff memos that I've seen. I only know what I've
3 seen.
4 Q You haven't tried to go and gather any
5 records outside of this administrative record?
6 A That's correct.
7 Q And so as an expert, you don't feel you need
8 to get more evidence even if it's relevant?
9 A I don't feel that. I feel as though I
10 should obtain as much information as I can.
11 Q Now, the groundwater permit -- you reviewed
12 the statement of basis for that?
13 A I have.
14 Q And it discusses the original design of the
15 tailing cells, the construction of the tailing cells,
16 the operation of the tailing cells. You agree with my
17 statement?
18 A I do. It's schematic, but it discusses it.
19 Q It's a 52-page document. You think that's a
20 schematic?
21 A I do.
22 Q It was drafted by Loren Morton. Are you
23 aware that the State of Utah has already determined
24 that these tailing cells are legal under the
25 groundwater permit rules?

1 A I'm aware of that.
2 Q And so those tailing cells as we sit here
3 today are legally permitted to accept tailings.
4 Correct?
5 A I understand. Yes.
6 Q And all of the issues that you're raising
7 here go to that very decision, don't they?
8 A I think they should.
9 Q Are you aware that that decision is a final
10 action and it hasn't been appealed?
11 MR. STILLS: Objection. Asks for a legal
12 conclusion --
13 A Don't know the answer to that.
14 MR. STILLS: Excuse me.
15 MR. ZODY: Pardon me.
16 MR. BRADFORD: The objection is sustained.
17 Please go to the next question.
18 MR. ZODY: Thank you. Lost my train of
19 thought.
20 Can you read back my last question, please.
21 (Pending question was read back.)
22 MR. ZODY: Thank you, Mr. Weber.
23 MR. BRADFORD: Laura Lockhart, do you have
24 any questions?
25 MS. LOCKHART: (Shakes head from side to

1 side.)
2 MR. BRADFORD: Sierra Club, any redirect on
3 this?
4 MR. BARTLETT: We do.
5 EXAMINATION
6 BY MR. BARTLETT:
7 Q Thank you. Mr. Weber. Are you a legal
8 expert in any way, shape, or form?
9 A Certainly not.
10 Q Do you have any legal expertise in
11 groundwater?
12 A Layman's legal expertise.
13 Q Are you a trained lawyer?
14 A No.
15 Q Do you understand the ins and outs of
16 groundwater permitting from a legal perspective?
17 A No.
18 Q Would you even pretend to be a lay expert on
19 groundwater law?
20 A I'd rather not be, thank you.
21 Q Your expertise, as you described it in your
22 direct testimony, relates to your work at Kennecott.
23 Is that correct?
24 A The work at Kennecott and many, many
25 additional years in environment construction.

1 Q During that time, again, you were on a team
2 of experts dealing with waste contamination. Is that
3 correct?
4 A At Kennecott that was our result of the
5 activity.
6 Q And those issues dealt with liner systems.
7 Is that correct?
8 A A great deal.
9 Q Membrane liners?
10 A Membrane liners.
11 Q Similar to ones that are used at the IUC
12 mill?
13 A Yes.
14 MR. ZODY: Object. Lack of foundation.
15 Q (By MR. BARTLETT) Is that correct?
16 MR. BRADFORD: Please answer the question.
17 A The answer is yes, but the membranes at
18 Kennecott were much, much heavier and a different
19 composition entirely.
20 Q Were they multiple layer liners?
21 A Multiple layer lines.
22 Q And you believe that that experience at
23 Kennecott enables you to speak here today as an
24 expert?
25 MR. ZODY: Object. Asked and answered.

1 Leading.
2 MR. BARTLETT: I withdraw the question.
3 Thank you, Mr. Weber.
4 MR. BRADFORD: I think the Sierra Club will
5 call a new witness. Just a point here on a note for
6 myself as chairman here. Obviously I'm not an
7 attorney, and so in directing this today I'm getting
8 some advice from Fred Nelson. And we'll do our best
9 to be fair and equitable here in our -- what we allow
10 but just ask for your forbearance as we proceed as a
11 body who are not attorneys. Thank you.
12 MR. STILLS: Appreciate that. Thank you
13 very much. Now, if I could get a time check as I go.
14 MR. JONES: Two hours, 39 minutes.
15 MR. STILLS: I would like to now call Lauren
16 Morton as the next witness. I'd like to introduce
17 Mr. Lauren Morton to provide some testimony.
18 MR. NELSON: Excuse me just a minute. I was
19 just asked a question by Mr. Nelson as far as the
20 Board, if the Board had any questions of Mr. Weber.
21 We ought to have Mr. Weber answer questions from the
22 Board if they had any questions of him this morning.
23 The Board can jump in any time they want to ask a
24 question.
25 Go ahead.

MR. STILLS: I'll give you a minute because I should have also thought of that. If there's any questions, we'd be happy to have Mr. Weber come back in an hour or at another time.

MR. PATTISON: I don't know that man's name or that man's name at all. I can't hear your name. I know you, and I know Mr. Zody, but I don't know you. Could we have your names so we know who you are?

MR. BRADFORD: When you stand up to speak, if you'd just introduce yourself each time, that would be helpful.

MR. BARTLETT: Just for future reference I'm Brad Bartlett, and I'm an attorney with the Energy Minerals Law Center representing today the Sierra Club.

MR. HUGHES: My name is Robert Hughes.

MR. PATTISON: Weber?

MR. HUGHES: Hughes.

MR. PATTISON: Hughes, okay. Thank you.

MR. BRADFORD: No questions?

Please proceed.

Swear the witness, please.

LOREN MORTON,

called as a witness, being first duly sworn, was examined and testified as follows:

1 EXAMINATION
2 BY MR. STILLS:
3 Q Good morning, Mr. Morton.
4 A Good morning.
5 Q Could you please describe for the Board your
6 position at the Division of Radiation Control?
7 A Currently I'm a section manager.
8 Q And as section manager do your
9 responsibilities extend to matters of the liner
10 systems, the waste containment systems, at the IUC
11 mill?
12 A Yes, sir.
13 Q Are you familiar with the single layer,
14 30-mil liner used at the IUC mill?
15 A Sure, yes.
16 Q As part of your responsibilities, are you
17 also familiar with the liner system used at the Energy
18 Solutions facility?
19 A In Tooele County? Yes.
20 Q Yes. Could you please describe the type of
21 liner system that's used in the Energy Solutions
22 facility?
23 A Can you be more specific? Which disposal
24 cell are you interested in?
25 Q The most recent cell that's been put in

1 place there. I'm sorry, I don't have the name of it
2 on hand.
3 A Waste disposal -- low level radioactive
4 waste disposal? Mixed waste disposal? Evaporation
5 ponds? Which cells are you --
6 Q I'm sorry. I should have been more specific
7 with that question. With the mixed waste disposal
8 cells.
9 A HHHDPE, dual leak detection systems.
10 Q When you say "dual leak detection systems,"
11 what does that mean?
12 A There's a geonet material between each of
13 the three membranes.
14 Q Okay. So if -- you'll have three membranes,
15 and each of the spaces between those membranes will
16 have --
17 A A drainage net.
18 Q -- a drainage net. And will there be a
19 monitoring system between those?
20 A Those drainage nets drain to a low point
21 where fluids are observed, yes.
22 Q Okay. Is that type of liner system in place
23 at the IUC mill?
24 A No, sir.
25 Q Mr. Morton, did you -- do you recall the two

1 reports that you wrote in 2000 that we discussed, I
2 believe, in the deposition?
3 A Yes, sir.
4 MR. STILLS: And for the record, those
5 reports are attached in Exhibits 1 and 2 of our
6 opening brief. If I may approach, I have a couple of
7 page excerpts. I'm referring Mr. Morton to Exhibit 2
8 of our opening brief, and at the bottom it is stamped
9 DRC IUC DIC -- DISC 0697.
10 Q (By MR. STILLS) And, Mr. Morton -- I'm
11 sorry. Can you -- I provided that to refresh your
12 memory. Could you summarize the conclusions that you
13 made in that June 27, 2000 memorandum?
14 A Well, they appear here as nine different
15 paragraphs. There's some description about leak
16 detection systems either being missing or insensitive;
17 some concerns about the liner construction back at the
18 time that the cells were built; some suggestions on
19 how permitting should proceed, some discussion about
20 the Fly-Ash Pond and some acknowledgment of improved
21 design at cell 4A. Do you want me to read all nine
22 points here?
23 Q No. I just wanted you to briefly summarize,
24 and because of the time we have we'll be doing that
25 today quite a bit. In your first one I will actually

1 ask you to read the first sentence, if you don't mind.
2 A Paragraph 1?
3 Q Yes.
4 A Page 26?
5 Q Yes.
6 MR. ZODY: I'm just going to preserve an
7 objection. I know it won't be sustained, but I want
8 to preserve it for my record. I want to object to
9 this line of questioning about a permit that has
10 already been issued and is final and has not been
11 appealed. This whole line of questioning goes to
12 that. There was a time and a place for that
13 discussion. It didn't happen. So I believe this is
14 not relevant to the proceeding, but I understand you
15 will let the evidence in.
16 MR. STILLS: If the Board will hear me
17 through, I believe you'll see in a moment why it's
18 specifically relevant to what we're here to do today.
19 MR. BRADFORD: Proceed.
20 Q (By MR. STILLS) If you could, go ahead and
21 read No. 1.
22 A Paragraph 1: "It is unlikely that any leak
23 detection system exists under IUC waste water disposal
24 cell 1."
25 Q That's good. Because I don't want to have

1 to read all of it because of the things that have been
2 noticed. The first sentence in No. 2, please.
3 A "Leak detections systems found under IUC
4 cells 2 and 3 are grossly inadequate."
5 Q And point No. 3, the first sentence again.
6 A "Multiple lines of evidence also suggest
7 that the 30-mil PVC membrane used as FML in cells 1,
8 2, and 3 is prone to excess leakage."
9 Q That's good. I'll hold us there. Thank
10 you. And Mr. Morton, are you familiar with the
11 groundwater monitoring program at the IUC mill?
12 A Yes, sir.
13 Q If I may. Could you give me the page number
14 at the bottom right corner of the document I just
15 handed you?
16 A DRC IUC DISC 0107.
17 Q And this document, for the record, is found
18 in Exhibit 3. I'm sorry. I misspoke as far as where
19 it is found.
20 MR. NELSON: I believe it's a part of the
21 package of administrative records that was handed out.
22 MS. LOCKHART: No. This is a DISC document.
23 MR. STILLS: In my bound volume it is listed
24 as the November 30, 2006 White Mesa Uranium Mill, but
25 somehow it is -- at least in my volume it's behind

1 Exhibit 5, so there may be a little bit of confusion
2 with it. It's page DRC IUC DISC 0107, for the record,
3 so we know where it is.
4 MS. LOCKHART: This is your opening brief?
5 MR. STILLS: Yes. My apologies for it being
6 bound out of order.
7 Q (By MR. STILLS) Could you describe these
8 tables that I provided you?
9 A Groundwater concentration results for
10 several wells at the facility.
11 Q Okay. And what are the dates for the
12 sampling events in these tables?
13 A They're organized by quarter and calendar
14 year.
15 Q And do these -- maybe I should be more
16 specific. What is the earliest date for these
17 sampling events as reported in this chart? I asked
18 you that in an awkward way. Are the sampling
19 events -- do they go back as far as 2005?
20 A Yes. It appears so, yeah.
21 Q Okay. And are these sampling events that
22 were taken pursuant to the permit that was issued?
23 A Yes. The permit was issued March '05.
24 Q So these sampling events took place after
25 the final Agency action that adopted the groundwater

1 permit. Is that correct?
2 A Yes.
3 Q Okay. And could you describe the
4 groundwater monitoring that's indicated in these
5 charts concerning selenium?
6 A Well, I would have to take the time to read
7 these numbers.
8 Q Let me ask it a different way. Do you
9 recall what the groundwater monitoring of these charts
10 indicates concerning selenium?
11 A My recollection is there are some
12 exceedances of state groundwater standards, but as to
13 specific wells and dates --
14 Q Okay. We've got a short amount of time.
15 A -- I don't keep that memorized.
16 MR. STILLS: And as Mr. Zody pointed out,
17 the documents are in here in the record. I would be
18 happy to take questions on them and direct the Board
19 to -- request the Board, I'm sorry, to look at it at
20 your convenience.
21 Q (By MR. STILLS) Do you recall what this
22 report says about manganese?
23 A Verbatim, no.
24 Q But these results -- are manganese reported
25 here in the exceedances of the groundwater standards?

1 A There were certain wells, yes, that did
2 exceed State standards. I should better say that the
3 compliance limit established in the permit.
4 Q If you could turn to page 113, 0113, I can
5 refer you to the manganese levels. The standard -- is
6 that accurate that the standard is 400? If I can
7 refer you to the top of the column.
8 A The compliance limit is 400.
9 Q And what are the results indicating on the
10 right side?
11 A Roughly they're higher by an order of
12 magnitude.
13 Q Are all the reporting data there since June
14 of 2005 more than 10 times the limit?
15 A That is the order of magnitude, yes.
16 Q And generally can you summarize what this
17 table says about groundwater monitoring results for
18 uranium?
19 A They're similar -- there are some
20 exceedances for uranium, yes, in certain wells.
21 Q Have you ruled out the tailing cells as the
22 source of these groundwater exceedances?
23 A No.
24 Q Were you -- when you were in deposition I
25 believe it was your testimony that you oversaw the

1 preparation of the Safety Evaluation Report?
2 A Yes. Of November '05?
3 Q Yes.
4 A Yes.
5 Q And you were aware of these monitoring data
6 under the permit that was issued in 2005 when you were
7 preparing that report?
8 A Correct.
9 Q Were these exceedances disclosed in your
10 report?
11 A In the Safety Evaluation Report?
12 Q In the Safety Evaluation Report.
13 A Not to my recollection.
14 Q You were here for the testimony of Mr. Ivan
15 Weber?
16 A Certainly.
17 Q Did you hear his description of the
18 mechanical integrity test?
19 A I heard him describe conditions at the time
20 of construction.
21 Q Are you familiar with mechanical integrity
22 tests?
23 A Some, yes.
24 Q And what are those used for?
25 A What are you referring to, Counsel?

1 Q Are the mechanical -- are there types of
2 mechanical integrity tests that could determine
3 whether there is leakage across the liner membrane in
4 the cells at the IUC facility?
5 A Are you referring to quality assurance
6 testing, quality control testing as a part of
7 construction or something that is done
8 postconstruction?
9 Q I appreciate your clarifying to make sure we
10 understand each other. What I'm asking about is if
11 there's a test that we could determine today whether
12 the cells at the IUC facility -- whether the liner
13 membrane is intact or whether there are -- as you have
14 testified and said, whether there are leaks ongoing at
15 the facility.
16 A Certainly. Yes, there are methods.
17 Q And are there types of mechanical integrity
18 tests that can use the conductivity of an electrical
19 charge and then a probe to determine whether that
20 electrical charge moves across the liner?
21 A Yes, there are.
22 Q And has that been employed at the mill?
23 A No.
24 Q Would that be something that the DRC could
25 employ to determine if these liners are still intact

1 or whether these 30-mil liners have been ruptured
2 either upon installation or subsequent?
3 A These geophysical methods you're speaking of
4 are -- can be very subjective. And in preparation of
5 the permit we chose to use groundwater monitoring
6 because it would -- we felt it would be less
7 subjective than geophysical techniques. The
8 electrical methods you speak of are a type of
9 geophysical technique that relates to dipole theory.
10 And it has been applied many places, but it's not
11 always an easy call.
12 Q And even if it's not perfect and I think, as
13 you said, subjective, it could be the type of test
14 that would be helpful with the results published in a
15 Safety Evaluation Report to give us more information
16 on what is happening at the uranium mill?
17 A There's no guarantee of that.
18 Q I appreciate the lack of guarantees, but it
19 could be useful.
20 A At the time we prepared the permit, I felt,
21 and I continue today, that groundwater monitoring data
22 would be more conclusive than geophysical techniques.
23 Q And groundwater monitoring data indicates
24 that there are exceedances in groundwater standards
25 linked to constituents that are found in the IUC

1 ponds --
2 MR. ZODY: Object.
3 Q (By MR. STILLS) -- waste disposal cells.
4 MR. ZODY: Object. Mischaracterizes
5 testimony.
6 A What's your question, Counsel?
7 Q I asked, based on what you said about the
8 use of groundwater monitoring, there are exceedances
9 in those materials that are -- in the groundwater.
10 Those same materials are found in the disposal cells?
11 A These that are presented here in front of me
12 today, yes. These -- they're found in the tailing
13 cells, and there have been some exceedances found in
14 groundwater monitoring.
15 MR. STILLS: I appreciate you taking the
16 time, Mr. Morton. That's all I have at the moment.
17 Thank you.
18 DR. NELSON: I'd like to ask a question,
19 quick question, Loren.
20 EXAMINATION
21 BY DR. NELSON:
22 Q How are these groundwater control limits
23 established for each of the wells?
24 A The groundwater what?
25 Q The groundwater control limits, how they are

1 established?
2 A Well, they're -- to answer your question it
3 would have to be done in two parts. There's a
4 standard procedure that we use normally when issuing a
5 permit, and then there's what we use for this permit,
6 and they're different. The historical groundwater
7 quality data goes back to about '79 at this facility.
8 But we had some concerns about its quality and quality
9 controls and the qualifications in the laboratory
10 performing the results.
11 And so at the time we issued the permit we
12 weren't comfortable using descriptive statistics to
13 set the compliance limits. And we instead provisioned
14 the permit to have a background groundwater quality
15 report prepared for it to be evaluated at a later
16 date. It was required to be submitted in June 2005.
17 And the idea was we would come back and
18 reevaluate this issue later. At the time I felt it
19 was going to be a very lengthy process to walk through
20 more than 25 years worth of data, and we needed to get
21 the permit issued expediently. We had become an
22 agreement state in August of '04.
23 What we did, we took the groundwater
24 standard for each of these contaminants and multiplied
25 it by a factor depending on it's solids content on a

1 well-by-well basis. In some cases that was
2 50 percent. In other cases it was 25 percent. And it
3 was a place to begin.
4 And that's allowed under the groundwater
5 rules. It's very simple. It's simplistic, but it
6 gave us a starting point. And then we fully
7 recognized later more data would be added and we would
8 be able to do a robust evaluation of that data and
9 work on the more defensible protection level or
10 compliance limit in the permit.
11 Q So let me restate what I think I heard.
12 Rather than using historical data and applying some
13 sort of statistic, you used a state groundwater
14 quality standard multiplied by some factor.
15 A By some factor. And depending on class the
16 factor was a quarter or one-half.
17 DR. NELSON: Thanks.
18 EXAMINATION
19 BY MR. BRADFORD:
20 Q Mr. Morton, since the permit has been in
21 place and you have the most current data, have
22 additional requirements been put on the facility
23 because of the higher levels that you've seen in some
24 of the laboratory results -- additional monitoring,
25 more frequent monitoring, monitoring additional

1 locations? Have you changed the requirements because
2 of what you're seeing in the data?
3 A Let me try to answer that question in two
4 parts. The issuance of the permit required a number
5 of new wells to be installed just by the sheer
6 issuance of the permit. Second, as some of these
7 results have come in, when their exceedances are
8 triggered, they're required by the permit to
9 accelerate their monitoring and pull more samples.
10 Q So that has happened in some cases?
11 A And that is happened, yeah.
12 MR. BRADFORD: Thank you.
13 EXAMINATION
14 BY MR. CONE:
15 Q I just had a quick question. As the
16 regulator of these cells -- and I'm pretty concerned
17 about seeing some of the groundwater numbers here. I
18 mean, is it your opinion that the cells have integrity
19 right now and that some of these numbers are from
20 natural conditions? There's some speculation here,
21 but do you think there's integrity in the liner and
22 the cells?
23 A I have no opinion on that matter. A
24 background groundwater quality report was submitted in
25 January of '07, and it's under study at this time.

1 MR. CONE: Thank you.
2 EXAMINATION
3 BY MR. JENKINS:
4 Q With respect to your contamination -- or,
5 rather, your control limits that you've set, has an
6 assessment been done with regard to the toxicity maybe
7 of ingesting from these, or are these just purely
8 administrative in nature?
9 A The groundwater quality standards are
10 promulgated by rule. They're taken from EPA drinking
11 water standards which have a long-standing toxicology
12 basis. In certain instances, as allowed by rule, we
13 can -- in the issuance of a permit we can establish ad
14 hoc standards for contaminants that appear at a
15 facility where the rule doesn't have a standard yet.
16 And we did do some research to establish some of those
17 ad hoc standards as a process -- as a part of issuing
18 the permit.
19 The long and short of it is, yes, there's a
20 toxicology basis, otherwise we won't set a standard in
21 a permit.
22 MR. BRADFORD: I believe it's for IUC to
23 cross-examine here.
24 EXAMINATION
25

1 BY MR. ZODY:
2 Q Good morning, Mr. Morton. As I understand
3 it, the groundwater permit called for a study to help
4 try to understand what the background conditions of
5 constituents in the groundwater are at the site. Is
6 that correct?
7 A (Witness nods head up and down.)
8 Q And it contemplates once that study is
9 submitted there will be additional analysis to
10 determine whether these constituents that are showing
11 up in the groundwater are from background or from
12 something else. Correct?
13 A Correct.
14 Q Mr. Morton, I've just handed you Exhibit 2
15 from the mill. What is that document?
16 A Title is Background Groundwater Quality
17 Report Existing Wells for Denison Mines USA
18 Corporation, White Mesa Mill site, San Juan County,
19 Utah.
20 Q Have you reviewed that report, Mr. Morton?
21 A No.
22 Q Have you peeked at it at all?
23 A No.
24 Q You haven't even lifted the cover, I take
25 it, at this point.

1 A I've had a presentation from your client's
2 consultant. I've listened to a two-hour presentation.
3 But, no, I have not read the report.
4 Q And what did the consultant say were the
5 conclusions of the report?
6 A As I remember them, they were twofold --
7 MR. STILLS: Objection.
8 A -- one he didn't believe there was
9 contamination; and two, if there was, it was very
10 small.
11 Q Now, the groundwater that we're talking
12 about here is the shallow perched aquifer?
13 A Yes, sir.
14 Q About 80 feet?
15 A Between 80 and 120. I'm sorry. I take that
16 back. Between 15 feet and 120.
17 Q The fact that this study was ongoing was
18 known by your agency at the time you issued the
19 permit -- the license amendment in this case.
20 Correct?
21 A At the time we issued the SER in
22 November 2005, this report was overdue.
23 Q But at that time the concept that background
24 was still being established was known to the Agency?
25 A We had plans to do that, yes, and a report

1 was required.
2 Q Mr. Morton, I'm going to hand you the Safety
3 Evaluation Report -- this is November 2, 2005 Safety
4 Evaluation Report -- and refer you to the references.
5 And does this document refer to the statement of basis
6 and the groundwater permit?
7 MR. STILLS: I'm sorry. What page are you
8 referencing?
9 A All right.
10 MR. STILLS: I'm sorry. Could we get the
11 page that was referenced?
12 MR. DeROSSO: Could we see that reference,
13 please?
14 MR. ZODY: The page I have referenced --
15 A DRC 000247?
16 Q Yes, correct.
17 MR. DeROSSO: The face of the document,
18 though --
19 MR. STILLS: That's actually not the --
20 MR. ZODY: This is the Safety Evaluation
21 Report. The copy I have with me right now is not
22 numbered the same as yours. It's the same document.
23 MR. NELSON: Do we have the number?
24 MR. ZODY: I'm going to use a different
25 document. I'm going to use the one that -- this is

1 Laura's Exhibit 3. DRC IUC 799A is the first page.
2 MR. NELSON: Where is it attached to, Laura?
3 MS. LOCKHART: That's -- I don't remember
4 that it was attached. That is in the large bunch of
5 documents that were given. It is the Executive
6 Secretary's record.
7 DR. NELSON: What's the page number again?
8 MS. LOCKHART: It should be in page order.
9 799A.
10 MR. ZODY: I'm looking at with Mr. Morton
11 799T.
12 MR. STILLS: It's actually attached to the
13 IUC's opening brief as Exhibit 1, I believe. I'm
14 sorry. I referred you to the wrong one.
15 Q (By MR. ZODY) Mr. Morton, do you have the
16 document in front of you?
17 A DRC IUC 799T, that's the page I'm looking
18 at.
19 Q And that's the references that are cited in
20 the Safety Evaluation Report. Correct?
21 A Yep. Page 18 of that SER.
22 Q Does that refer to the statement basis for
23 the groundwater permit and the groundwater permit?
24 A It does on the following page, 799U, and
25 it's the second reference down: December 1, 2004

1 statement of basis.
2 Q In issuing the license amendment in this
3 case, you did analyze groundwater. Correct?
4 A Repeat the question.
5 Q In issuing the license amendment that's at
6 issue before the Board now, not the groundwater permit
7 but the license amendment, the Agency did analyze
8 groundwater issues.
9 A There's a discussion about that in the SER,
10 a brief mention of it on page 5, but it's very
11 cryptic.
12 Q Now, you recall sending a letter to the mill
13 requesting that they consider adding additional
14 parameters to the groundwater monitoring permit?
15 A That was done as a part of the permit
16 issuance. That draft permit was sent out to the
17 public in December of '04.
18 Q I'm talking about in this license amendment.
19 Do you recall that tin was added to the groundwater
20 permit?
21 A Okay. Now you're talking -- thank you for
22 helping me. In this SER, yes, we added tin to the
23 monitoring parameters list.
24 Q And there's discussion of that fact in the
25 SER?

1 A There is and those -- that starts on 799L
2 and continues through 799T.
3 Q Just describe the process that the Agency
4 went through in assessing that issue and coming to
5 that conclusion to add tin to the groundwater permit.
6 A We looked at the characterization work that
7 had been done by Ms. Tischler, and she had made an
8 estimate of how the characteristics would -- of the
9 material already in the impoundment at White Mesa
10 would change if the 32,000 tons of the Oklahoma
11 material were to be processed and disposed.
12 And there -- we came up with a list of 48
13 contaminants, and right off the bat we eliminated 26
14 because they're already being monitored for in the
15 permit. Then we went through a winnowing process of
16 trying to evaluate which -- are there any other
17 parameters of concern that we should be worried about.
18 And on page 10 which is -- I'm sorry, 799L, there's
19 six bullets there that describe how we got to this
20 winnowing process.
21 The first one being do we already monitor
22 for it in the permit, and the second one, is there a
23 significant increase going to be experienced or
24 anticipated in the tailing cell inventory because of
25 this new material being contemplated. Third is are

1 any of those new contaminants considered to be mobile
2 in groundwater environment. Fourth, is there a
3 toxicity hazard, a known toxicity hazard, to human
4 health? And five, is there a compliance standard we
5 can identify? Generally those are drinking water
6 standards. And six, are there regulatory approved
7 analytical methods that we can use with confidence to
8 measure that contaminant? Those are the six factors
9 we considered in arriving at what kind of monitoring
10 might need to be done for this alternate feed.
11 Q And that's all explained in the statement of
12 basis -- excuse me in the SER?
13 A I was reading from the SER, yes, on
14 page 799L.
15 MR. ZODY: Thank you. No further questions.
16 MR. BRADFORD: Laura, no questions?
17 MS. LOCKHART: (Shakes head from side to
18 side.)
19 MR. BRADFORD: We're going to take a short
20 recess.
21 MR. STILLS: Quick redirect.
22 MR. BRADFORD: Excuse me. You have some
23 redirect?
24 MR. STILLS: Very short. I don't mean to
25 interrupt your scheduling. It should take a few

1 minutes.
2 MR. BRADFORD: Let's go ahead and finish
3 with this witness, and then we'll take a break.
4 So go ahead with your redirect.
5 MR. STILLS: Thank you.
6 EXAMINATION
7 BY MR. STILLS:
8 Q Again, your testimony was that the
9 groundwater statement of basis that you referred to
10 briefly in the text and you cited in the references --
11 that was from December 1, 2005?
12 A '4.
13 Q I'm sorry. December 1, 2004. That predated
14 the issuance of the groundwater permit which was
15 issued in -- what date?
16 A March '05.
17 Q March '05. And you have standards in place
18 where we have measured exceedances, I believe is the
19 testimony, in manganese and selenium. Is that
20 correct? The monitoring showed groundwater
21 exceedances for manganese, selenium?
22 A The table you put in front of me earlier had
23 several contaminants. Those were two among them,
24 yeah.
25 Q Your testimony was that there was

1 considerable discussion in the Safety Evaluation
2 Report about additional new monitoring parameters. Is
3 that correct?
4 A As a result of considering the Fansteel
5 proposal?
6 Q Yes.
7 A One parameter was added to the monitoring
8 list, yes.
9 Q And was manganese already an existing -- if
10 I could turn you to DRC IUC 799W, manganese was not a
11 new monitoring parameter added. Is that correct?
12 A It was a part of the original permit issued
13 in March of '05.
14 Q Okay. So it wasn't part of the
15 consideration of new monitoring parameters since there
16 was already one in existence?
17 A Can you repeat the question, please?
18 Q There was already a new monitoring -- there
19 was already manganese as a monitoring parameter at
20 that time.
21 A That's correct. And in the SER if you'll go
22 to -- there's a table on page 799M, like Morton.
23 Sorry.
24 Q I appreciate it. Thank you.
25 A We list 26 parameters that are already being

1 monitored for, and manganese is on the list.
2 Q Okay. Thank you. Is there any indication
3 there that manganese has been found in exceedances of
4 the standards since the 2005 SER has taken place?
5 A In the SER?
6 Q Yes.
7 A No.
8 Q If I could direct you back to page 799 --
9 selenium was on that list as well. Correct?
10 A Yes, sir, it was.
11 Q So we're not flipping back and forth on our
12 pages, was uranium on that list?
13 A Boy, it's not here in black and white.
14 Q Should it have been?
15 A Well, it is in the permit.
16 Q So there was an error and it didn't get in
17 here?
18 A There was a typo, yes.
19 Q But there's no indication that uranium was
20 being found in exceedances shown in that chart at this
21 time when this SER was --
22 A In fact there's no discussion of any
23 contaminants in exceedances in the SER.
24 Q Okay. And I want to direct you back now to
25 the 799W, summary of components of Fansteel.

1 MR. STILLS: I said I was going to be short.
2 I will be short. I'm sorry. I'm denying you a break.
3 I appreciate you staying here with me for just a
4 minute.
5 Q (By MR. STILLS) If you would run your finger
6 down to manganese, and these are in alphabetical
7 order, and hold on manganese, and then bring your
8 finger across to the second -- I'm sorry, the third
9 and fourth columns there, estimated mass of mill
10 tailings and mass of mill tailings after uranium
11 processing, manganese, as you've testified before, has
12 been found in the order of magnitude above the
13 standards.
14 What does the introduction of the alternate
15 feeds into the tailing cells at the IUC mill do to the
16 mass of manganese at the mill?
17 A It's an increase of about threefold.
18 Q So over the 26 years that this facility has
19 been operating, it's estimated to be 258 tons of
20 manganese, and we have a groundwater exceedance at the
21 mill in manganese, and this will triple -- this 32,000
22 will triple the mass of manganese. If I could have
23 you look down to --
24 MR. ZODY: Objection. There was no question
25 there. Counsel is testifying at this point. It's not

1 redirect.
2 MR. BRADFORD: Sustained. Noted.
3 MR. STILLS: I'm talking about addition of
4 new materials and there was testimony on that.
5 Q (By MR. STILLS) I just want to drop you down
6 to one last thing, and I will be done. Is there any
7 indication on the increase of uranium in the mill
8 according to this?
9 A Uranium is not on this table.
10 MR. STILLS: Okay. Thank you.
11 And I appreciate your waiting a couple
12 minutes. I was trying to get done within the break so
13 we had it all. I appreciate your patience.
14 EXAMINATION
15 BY DR. NELSON:
16 Q I have a quick question, and it's a little
17 bit loaded, but I'm trying to get at what I need to
18 know. We've -- I think I've learned that these
19 groundwater control limits -- I think I understand
20 what they're based on. They're based on the State
21 standard multiplied by some factor. I hear we have a
22 background report that hasn't been reviewed, so at
23 this point I have learned nothing about whether or not
24 things like selenium and manganese -- I have no sense
25 of whether there have been releases or not.

1 Are there any differences in the manganese
2 concentrations between up and downgradient wells? For
3 instance are there higher manganese concentrations in
4 downgradient wells as opposed to upgradient that would
5 be indicative of a possible leak?
6 A I haven't read this specific report prepared
7 by the consultant, but I have looked at older data as
8 a part of issuing the permit.
9 Q Well, I'm referring to this -- when we were
10 on these pages where counsel pointed out exceedances,
11 and we have monitoring wells listed MW-17, 18, 19.
12 And I don't know which ones are upgradient and which
13 ones are downgradient.
14 A This table here you're referring to --
15 Q Yeah.
16 A -- table 3?
17 Q So what I want to know --
18 A Relative position?
19 Q -- is relative position. Are the high
20 numbers in downgradient wells?
21 A Do you want me to walk through it page by
22 page for you?
23 Q No. But I would like an answer to that
24 question --
25 A A few years ago --

1 Q -- in general.
2 A A few years ago we went through a campaign
3 of split sampling for the facility. And if I remember
4 right, we collected -- there were three separate split
5 sampling events, and I remember looking at data that
6 came back from their lab and our lab. I do remember
7 manganese highs.
8 I remember plotting those concentrations on
9 iso concentration maps, and I remember the
10 concentration highs being south of cell 3. But that's
11 been -- I'm working off recollection here, Steve, and
12 that's probably about four years ago I was preparing
13 that. We pulled samples in '99, 2000, 2001. And
14 September '02, I think, is the last time we pulled a
15 split.
16 Q So assuming your recollection is correct, is
17 a high of -- south of cell 3, is that up or
18 downgradient?
19 A Down.
20 DR. NELSON: Thank you.
21 MR. BRADFORD: Okay. Now we will take a
22 short recess. We will start back up at 10:40 by the
23 clock on the back wall.
24 (A recess was taken from 10:23 to 10:37)
25 MR. BRADFORD: We are going to try to keep

1 the heat on because I know that quite a few people are
2 getting cold, so we're going to leave the heat on, but
3 it is noisy so we're going to ask, please, if you are
4 participating that you talk directly into a microphone
5 so we can all hear and so the court reporter can take
6 accurate notes.
7 So let's see. We're back with the Sierra
8 Club and their next witness.
9 MR. STILLS: All right. We're ready to go
10 here again. We're going to go ahead and move into a
11 different area of our testimony now. And again, as
12 we've said and we'll reiterate, we've submitted
13 considerable amount of written argument, documentary
14 evidence to support our case. So if you have any
15 questions throughout the day, please feel free to ask
16 us about those.
17 Right now I'd like to turn to and introduce
18 Paul Robinson. Mr. Robinson will present information
19 that supports the Sierra Club's request and help
20 demonstrate the public and the Executive Secretary
21 have provided insufficient information regarding the
22 content of the work-in-process materials.
23 If you can please administer the oath to
24 Mr. Robinson.
25 PAUL ROBINSON,

1 called as a witness, being first duly sworn,
2 was examined and testified as follows:
3

EXAMINATION

4 BY MR. STILLS:
5 Q Good morning, Mr. Robinson.
6 A Good morning.
7 Q Is that mic working okay?
8 A Is the mic working okay?
9 MR. BRADFORD: Yes.
10 Q (By MR. STILLS) Does the written testimony
11 that you provided accurately describe your relevant
12 experiences?
13 A Yes, it does.
14 Q And could you please summarize your relevant
15 professional experience dealing with uranium and
16 uranium mills?
17 A Yes. I have worked at Southwest Research
18 and Information Center, a science and educational
19 organization in Albuquerque, New Mexico, since 1976.
20 During that time I've prepared a number of
21 publications, peer-reviewed publications, contract
22 publications, and expert witness statements related to
23 uranium and other mining activities as well as the
24 solid waste and mixed waste and low level radioactive
25 waste facilities.

1 I've appeared as a witness in administrative
2 proceedings for about a half dozen different uranium
3 facilities in this country as well as uranium
4 facilities in Canada. My master's thesis, a
5 professional project paper, was on planning for
6 reclamation of uranium facilities in the former East
7 Germany. And I've taught environmental assessment
8 methods and environmental policy and evaluation at the
9 undergraduate and graduate level at the University of
10 New Mexico in the 1980s and '90s and 2001 and 2002.
11 Q And could you please summarize your previous
12 testimony at formal hearings regarding specifically
13 uranium mill tailings?
14 A The most recent was in a proceeding related
15 to the SOHIO L-Bar Uranium Mill now owned by Rio Tinto
16 through it's Kennecott subsidiary regarding the
17 alternative concentration limits requested from the
18 applicant, as groundwater standards had been exceeded
19 and the company applied for change in standards to
20 allow higher standards or more contamination to be
21 accepted.
22 I participated in the licensing proceedings
23 for the Bokum Uranium Mill which went through two
24 series of license proceedings in 1979 and 1980. I
25 participated in the groundwater discharge plan and

1 proceedings for the Homestake Uranium Mill in Milan,
2 New Mexico. I participated in the licensing
3 proceeding for the Homestake pitch project in
4 Colorado.
5 I participated in the licensing proceedings
6 for the Crow Butte uranium facility now operating in
7 western Nebraska. And I participated in proceedings
8 related to violations detected at the United Church of
9 Christ facility in western New Mexico. And I also
10 participated in proceedings related to the waste
11 management areas at the Elliott Lake uranium
12 facilities in Ontario, Canada. And I participated in
13 environment assessment review panels for uranium
14 facilities in Russia.
15 Q Mr. Robinson, again I thank you for that
16 summary.
17 MR. STILLS: And if I could refer you to the
18 remainder of Mr. Robinson's qualifications, they're
19 found in our written submissions.
20 Q (By MR. STILLS) What documents have you
21 reviewed in preparing your testimony?
22 A I've reviewed the administrative record,
23 I've reviewed the documents filed by the parties since
24 the administrative record, and I've reviewed some of
25 the NRC filings related to the Fansteel facility in

1 Oklahoma.
2 Q And are the opinions you have reached in
3 this matter accurately recounted in your written
4 testimony?
5 A Yes, they are.
6 Q And as part of -- again we're shifting from
7 the previous line of inquiry. One of the things that
8 we're here today to discuss is the challenge to the
9 issuance of the by-product material license amendment.
10 Mr. Robinson, what do you understand the
11 term by-product material to mean?
12 A I understand by-product material to be the
13 material derived from the processing of ore for
14 recovery of uranium.
15 Q And you said that the Utah definition that
16 you had reviewed of by-product material uses the word
17 ore. What, in your opinion, does the word ore mean?
18 A Ore in my opinion is a type of mineral
19 deposit which has been shown to be amenable to
20 recovery of a valuable material at a profit. It's an
21 economic characterization of a natural occurring
22 mineral deposit.
23 Q And, again, we have a short time today, so
24 can you please summarize the relevant factors from
25 your written opinion that in your opinion are

1 necessary to determine whether a particular material
2 is an ore?
3 A In my opinion the ore characterization
4 requires a detailed and verifiable characterization of
5 the content of the deposit, the grade of the material,
6 demonstration that recovery can be achieved, and
7 demonstration that the recovery can be achieved in a
8 manner that generates income or economic value,
9 meaning that the value of what's recovered is higher
10 than the cost of the recovery, including the cost of
11 operation, decommissioning of the facility, not just
12 the specific recovery method.
13 Q Have you discussed these factors in any
14 publications you have written?
15 A Yes. A recent publication is: A Guide to
16 Support the Expanded Use of Citizens Environmental
17 Rights In Magadan and Eastern Russia. This
18 publication was deliverable under contract, funded by
19 the U.S. State Department Agency for International
20 Development and was published in 2004.
21 Q I think you noted it was published in both
22 Russian and English?
23 A It was translated --
24 Q Translated.
25 A -- into English -- translated into Russian.

1 My version was the English version.
2 Q Thank you. Sorry. I'll make sure I find
3 the mic here. Is the definition of ore that you used
4 in your publication the accepted division of ore
5 that's used in the mining industry?
6 A In my opinion, yes. The reference I used
7 for the definition in the publication was a text
8 called Introductory Mining Engineering.
9 Q And this is a well-understood definition of
10 ore as it is used?
11 A Yes. In my opinion it is the common,
12 well-accepted meaning of ore within the mining
13 industry.
14 Q And in your opinion is the information in
15 the administrative record adequate to make a judgment
16 regarding whether the work-in-process materials,
17 which -- I think the materials from Oklahoma, if I
18 may, will be referred to as different things
19 throughout the day: Fansteel material, uranium
20 materials, the Oklahoma materials. We've used the
21 specific term work-in-process materials because that's
22 an accurate description of the materials that are
23 found in ponds 2 and ponds 3 at the Muskogee facility
24 and which those sludge like materials are the only
25 materials that we believe could be brought into Utah.

1 I believe that may be an issue we discuss later.
2 MR. ZODY: Objection to the extent --
3 MR. STILLS: We use that word specifically
4 in there, at least three different characterizations
5 of that word used by different parties.
6 MR. ZODY: I don't think it's appropriate to
7 be having argument by Counsel during questioning. I
8 thought we had our argument already, but I'll leave
9 that to the Board.
10 MR. BRADFORD: Please proceed with your
11 questions.
12 MR. STILLS: Okay. To not be argumentative,
13 we use the work-in-process material because it's used
14 in the NRC documents. We'll leave it at that.
15 Q (By MR. STILLS) Could you please describe
16 the information you found in the administrative record
17 concerning the uranium contents? I'm sorry. I
18 skipped a question. Let me back up.
19 In your opinion is the information in the
20 administrative record adequate to make a judgment
21 regarding whether the work-in-process materials are
22 ores?
23 A My opinion, no, the information in the
24 record is not adequate to identify the
25 work-in-progress (sic.) material as ore. The

1 information regarding the grading rating is very
2 limited, and it does not meet the standards identified
3 in this country, in Canada, and Australia -- the
4 standards used by the mining industry for
5 identification of grade.
6 It provides no information demonstrated that
7 uranium can be recovered, and it provides no
8 information on the economic parameters of recovery or
9 operation of the facility that would be handling the
10 work-in-progress materials that are going to be
11 received.
12 Q As to the point No. 1 that you've made,
13 could you please describe the information you found in
14 the administrative record concerning the uranium
15 contents of the work-in-process materials?
16 A The application and the Safety Evaluation
17 Report report a uranium concentration, and that set of
18 numbers are derived from a set of nine -- of eight
19 bore holes, five in what's called pond No. 3 and three
20 in what's called pond No. 2. These bore holes were
21 driven approximately 15 feet through the material
22 in -- not below the work-in-progress materials.
23 There were three samples taken from each
24 hole. Those samples were mixed together, or
25 homogenized is in the word in the documents, and those

1 samples -- and data from those samples were reported.
2 There was not information on the sampling or the
3 analytic methods used. The data sheets were not
4 available, so the information cannot be verified or
5 replicated. And that's a very small number of samples
6 for the material which is identified as highly
7 variable. And the greater variability of the material
8 is a basis for increased characterization.
9 Q How many samples did you describe?
10 A There were eight wells, three samples from
11 each well, total of 24 individual uranium
12 concentration numbers that made up the averages that
13 were presented for the pond 2 and pond 3 in the SER
14 and in the application.
15 Q Based on your review, what year were those
16 samples taken?
17 A Those samples were taken in 1993. And
18 there's been considerable activity with the
19 work-in-process materials beyond the 1989 date listed
20 in the application at SER foreclosure. Fansteel had
21 an NRC license that was issued in 1997, and that
22 license provided for processing of materials including
23 uranium recovery. And Fansteel has enacted a sulfate
24 gross method in 1995 which was identified as a uranium
25 recovery method.

1 Q There's no indication in anything that
2 you've reviewed that they've been able to recover any
3 uranium at the Fansteel facility?
4 A There's no uranium recovery information
5 regarding the performance of the Fansteel operation.
6 Q Regarding your second fact that you
7 described before, were you able to find any
8 information concerning the recoverability of uranium
9 from these work-in-process materials? Were you able
10 to find any information concerning recoverability in
11 the administrative record?
12 A In my opinion there's no verifiable or
13 demonstrable data regarding uranium recovery. There
14 are a number of assurances provided by IUC's staff and
15 consultants.
16 Q Based on your knowledge of accepted
17 methodologies, and perhaps if you could describe some
18 of those methodologies, what information would you
19 expect to have been generated, what information would
20 you expect to find regarding the recoverability of
21 uranium?
22 A A demonstration of recoverability should
23 meet the standards established by the national,
24 international bodies that address mineral deposit
25 evaluation, and those include demonstrated methods

1 that use a bench scale or pilot scale test to verify
2 that recovery can actually be achieved.
3 Q And you mentioned bench scale test. Could
4 you describe for me what a bench scale test is?
5 A A bench scale test is a simulation or
6 replication of the mill -- a mill process done in a
7 lab on the researcher's bench, so it's at that lab
8 scale, bench scale.
9 Q And did you find any indication that a bench
10 scale test had been performed on the work-in-process
11 materials concerning uranium for this application?
12 A No. There's no indication that there were
13 bench scale tests or pilot tests to demonstrate
14 recovery in any of the materials in the administrative
15 record.
16 Q And if you could just expand a little bit,
17 explain what a pilot test is, which I think you
18 mentioned.
19 A A pilot test is a test involving a sample of
20 material closer to the scale of the commercial
21 operation to demonstrate the ability of the mill
22 processes to recover at a larger scale than a bench
23 scale but still smaller than the commercial or
24 full-scale operation.
25 Q Regarding the third factor you had

1 mentioned, were you able to find information
2 concerning profitability of that recovery, assuming
3 for the moment that there would be any, from the
4 work-in-process materials? Were you able to find any
5 information about the profitability in the
6 administrative record?
7 A No. In my opinion there's no information
8 regarding the cost of recovery or the cost of the
9 operation at the IUC relative to the -- any amount of
10 uranium that might be recovered from any materials.
11 Q So, in your opinion, have the proper
12 inquiries been made in this case to determine whether
13 these work-in-process materials constitute ore?
14 A My opinion, no. There's no competent
15 material analysis or economic analysis regarding the
16 grade of the material, the recoverability or the cost
17 of the recovering versus the value of what might be
18 recovered.
19 Q And did the Safety Evaluation Report address
20 these relevant factors to determine whether or not the
21 work-in-process materials could be classified as an
22 ore?
23 A In my opinion, no. The Safety Evaluation
24 Report adopted the statements of the application
25 verbatim including typographic errors in the

1 application. There were assurances provided regarding
2 recovery but no demonstration of recovery or
3 indication of the amount of uranium that would be
4 recovered from this material or any of the other
5 alternate feed materials that IUC has processed.
6 Q And based on your testimony and your
7 experience and in publication concerning mining
8 uranium mills, are there accepted methodologies that
9 the Board could employ to help the DRC make a
10 determination whether the work-in-process materials
11 are ore?
12 A Yes, there are accepted methodologies. And
13 I identify the Canadian Institute of Mining,
14 Metallurgy, and Petroleum, known by its initials CIM,
15 and the methods of the Joint Ore Reserves Committee of
16 Australia, JORC. CIM and JORC are the two standard
17 methods used internationally. And IUC has used the
18 CIM methods for characterization of its ores in the
19 Henry Mountains as part of their showing of the
20 attributes of that mineral deposit.
21 Q In your review of that Henry Mountain
22 report, did it investigate any of the relevant
23 questions that you brought up concerning the operation
24 of the White Mesa Mill or the IUC mill?
25 A The Henry Mountain report identified the

1 grade based on existing bore holes -- bore hole data,
2 and it identified the recovery methods and the
3 relevance of those recovery methods to the specific
4 types of ores that were identified at the Henry
5 Mountain complex and addressed the profitability of
6 those materials if processed for uranium recovery, in
7 a very lengthy report.
8 Q So -- so firms that are involved with the
9 milling of ores and recovery of uranium very regularly
10 prepare the kind of reports that you describe?
11 A Yes, yes. In my opinion the standard
12 methods used have been adopted by the mining industry
13 for use by the mining industry. They serve as a
14 mechanism to ensure that there's a standard or level
15 playing field that different firms are able to utilize
16 in -- to allow for comparisons between different
17 evaluations by deposit owners, deposit investors, and
18 other interested parties.
19 Q In review of these documents, using those
20 three factors that you describe would be a way to
21 understand to see whether the relevant information was
22 provided in one of those reports. Is that a fair
23 characterization of your testimony?
24 A As I understand the question, those standard
25 methods serve as a basis for comparison of the level

1 of detail provided about the work-in-progress
2 materials -- work-in-process materials. And there's
3 no effort by IUC to apply those methods or compare the
4 methods that are represented in their application to
5 the standard methods they're currently using for other
6 deposits.
7 Q And why in your opinion and based on your
8 experience -- why is this inquiry into ore important
9 anyway?
10 A In my opinion, ore is a natural material
11 that has mineral deposits that may be recoverable at a
12 profit. The institutions that operate uranium mines
13 and mills are businesses that are engaged in
14 activities to generate profit, and so it seems
15 reasonable to assume that the ores are being processed
16 for their values in order to generate income.
17 If the ore is not able to be demonstrably
18 processed for its uranium content or the ore would be
19 processed for very low grades of uranium recovery,
20 then there would by necessity be other sources of
21 income to allow the company to conduct the activity.
22 And there's no information on the potential income
23 from these -- the processing of these work-in-progress
24 materials or their acquisition in the application or
25 the SER.

1 Q So the analysis of whether or not something
2 is an ore would help provide information to compare
3 against disposal fees, recovery of other minerals to
4 find out whether or not the recovery of uranium was
5 the primary purpose of the processing?
6 A Yes, that's true. In addition, in my
7 opinion the materials that are described as the
8 work-in-process materials will be -- require
9 modifications of the methods in the mill as they are
10 described.
11 The costs of the extremely fine nature of
12 the work-in-process materials and their colloidal or
13 gel-like form prevents them going through the sorting
14 screens. The materials appear to have already been
15 processed by sulfate, and sulphuric acid is the
16 primary leaching agent in the mill.
17 And so the indications from the materials in
18 the administrative record as well as the Appalachian
19 Resources Report, which characterizes the materials in
20 much greater detail, the report from 2000 -- that
21 indicated there were difficulties handling that
22 material and there's no analysis as to why the uranium
23 would not have been recovered through the previous
24 processes which were described as sulfate-based, and
25 that sulfate-based processing has some similarities to

1 what's conducted at the IUC mill.
2 Q When were you first provided a full copy of
3 the Appalachian Resources Report?
4 A Last week. I was provided a partial copy a
5 week or so earlier.
6 Q Was the Appalachian Resources Report -- did
7 it confirm concerns you had regarding the material
8 content and recoverability of uranium from the
9 work-in-process materials that you had made based on
10 the administrative record?
11 A The -- I prepared my expert report after
12 reviewing only the narrative portion of the
13 Appalachian Resources Report. Portions of the report
14 were provided subsequently, and only in the last week
15 has a full copy been provided. But that report from
16 the year 2000 provides substantially more detail as to
17 the nature and content of the work-in-progress
18 materials.
19 And neither the application nor the
20 Appalachian Resources Report provides any information
21 as to the other material that would be processed as
22 the application was requested to process about 100
23 percent more than the actual work-in-progress --
24 process materials, about 32,000 tons. Only something
25 on the order of 16,000 tons is identified as work-in

1 process. The other material is not characterized in
2 any manner in either the application or the SER or the
3 Appalachian Resources Report.
4 MR. STILLS: If I may close -- and time
5 check?
6 MR. JONES: Hour, 46 minutes.
7 Q (By MR. STILLS) Correct me if I'm wrong, but
8 I want to summarize here that, one, you did not find a
9 reliable measurement of uranium contents of the
10 work-in-process material in the administrative record?
11 A Correct.
12 Q Two, there is no reliable assessment of
13 physical recoverability, bench scale test or pilot
14 test, contained in the administrative record?
15 A In my opinion, that's correct.
16 Q And there was no profitability estimate
17 based on price, processing costs, or the like found in
18 the administrative record?
19 A That's correct.
20 Q In your opinion, does that lack of
21 information prevent the determination of whether or
22 not these materials can qualify as ores?
23 A In my opinion, that's correct. That
24 information is essential to characterizing whether
25 material is an ore or merely a mineral deposit.

1 MR. STILLS: Thank you very much,
2 Mr. Robinson.
3 EXAMINATION
4 BY MR. ZODY:
5 Q Morning, Mr. Robinson.
6 A Good morning.
7 Q My name is Michael Zody. We met during your
8 deposition.
9 A Uh-huh (affirmative).
10 Q We're under a tight schedule here today, so
11 if possible I would like you to respond -- if my
12 question calls for a yes or no, give me a yes or no,
13 if that's fair.
14 A Yes.
15 Q But we are on a tight schedule. Are you a
16 licensed engineer?
17 A No, sir.
18 Q Are you a mining engineer?
19 A No, sir.
20 Q Are you a chemist?
21 A No, sir.
22 Q Are you a geologist?
23 A I've taken graduate classes in geology at
24 the University of New Mexico, but I'm not a licensed
25 nor registered professional geologist.

1 Q Are you a hydrogeologist?
2 A I've taken classes in hydrology, but I'm not
3 licensed or registered in that profession.
4 Q If you might speak up a little for me.
5 A I'm sorry.
6 Q Maybe it's just my hearing over here, but
7 that would help.
8 Are you a biologist?
9 A No, sir.
10 Q Are you a toxicologist?
11 A No.
12 Q Are you an accountant?
13 A No.
14 Q Are you an economist?
15 A No.
16 Q Have you ever prepared a sampling analysis
17 plan for a site remediation?
18 A I've participated in preparation of site
19 remediation plans for clients, yes.
20 Q My specific question is: Have you actually
21 been the person who prepared a plan where we're going
22 to go out and collect samples and analyze those?
23 A Yes.
24 Q Thank you. What about preparing a sampling
25 and analysis plan for evaluation of mineral reserves

1 or resources?
2 A No.
3 Q In your opinion 1 you discuss the
4 methodologies for determining whether something is an
5 ore. Correct?
6 A Correct.
7 Q I don't see anywhere in your opinion a
8 reference to the NRC's definition of ore that was
9 affirmed in the Ashland-2 case. Is there a reason for
10 that?
11 A I'm not familiar with a regulatory
12 definition of ore that the NRC might have issued.
13 That's why I referred to the Utah definition which
14 appeared to me to be the relevant definition for
15 proceeding in Utah.
16 Q You would agree with me there's no Utah
17 definition that has any analysis of the profit
18 included in the definition of ore. That's correct?
19 MR. STILLS: Object to vague foundation of
20 the question.
21 A The term --
22 Q Can you cite me a provision of a Utah
23 regulation or code that has the word profit associated
24 with the word ore?
25 MR. BARTLETT: Objection. Mr. Robinson is

1 not a legal expert, not being proffered as a legal
2 expert or attorney.
3 MR. BRADFORD: Just a yes or no question,
4 please. Answer the question.
5 A Could you repeat the question?
6 Q Can you cite me a provision in the Utah law,
7 statute, or regulation that associates the word profit
8 with the word ore?
9 A I find the word ore in the Utah regulations,
10 but I see no definition of that term.
11 Q And so the answer to the question that I'm
12 asking is you're not aware of any provision in Utah
13 law that associates the word profit with ore. That's
14 correct?
15 A That's correct.
16 Q Thank you. Mr. Robinson, you've referred to
17 the CIM definition standards. Let me use the full
18 title. This I take from document that you cited in
19 your opinion. The CIM definition standards on mineral
20 resources and mineral reserves prepared by the CIM
21 standing committee on reserve definitions adopted by
22 CIM council in November 14, 2004. Are you familiar
23 with that document?
24 A I am.
25 Q What does CIM stand for?

1 A CIM is the Canadian Institute of Mining,
2 Metallurgy, and Petroleum.
3 Q Isn't it correct that this document nowhere
4 defines the word ore?
5 A I see the word ore used and the
6 characterization of mineral deposits, grades from
7 resource to reserve, and the term reserve is a
8 characterization of ore.
9 Q Well, let's just be specific. The document
10 does define the terms mineral reserve and mineral
11 resource. Correct?
12 A Correct.
13 Q But it does not contain a definition of the
14 word ore, does it?
15 A That's correct.
16 Q Nowhere, in fact, does that document use the
17 word ore, does it?
18 A I'm not familiar with all the CIM documents,
19 but the calculation of reserves and the conversion of
20 deposits to -- from resource to reserve is the
21 transition from mineral deposit to ore, as I
22 understand it, in both U.S. and Canada. So reserve is
23 a term that applies to ore. Resource is a term that
24 applies to mineral deposit.
25 Q Yet they don't happen to use the word ore in

1 this document that you say has the definition of ore.
2 A I believe I say that --
3 Q Can I get a yes or no answer?
4 A I do not believe I have said that those
5 standards define the term ore. They are used to
6 define ores. The definition that I used was the
7 definition from the Introductory Mining Engineering
8 text. And the methods used to characterize those
9 materials are the methods from CIM and JORC that I
10 identified.
11 Q Thank you. Aren't these documents, these
12 CIM documents, designed for a whole different purpose
13 than what we're talking about here today? Aren't
14 these designed to protect investors?
15 A I don't believe that there's a difference
16 between what we're doing today and protecting
17 investors because investors are the owners of the
18 uranium facilities, and it's the operation of uranium
19 facilities that we're talking about.
20 Q The definition that you provided you say
21 applies to obviously conventional ores, and you want
22 to apply it to alternate feed materials as well.
23 Correct?
24 A I don't see the term alternate feed
25 materials in the Utah rules. I only see the term ore,

1 so that's the matter that appears to be before the
2 Board today.
3 Q Fair enough. Thank you. In this
4 profit-based definition of ore -- let me go back,
5 actually. You refer to a Henry Mountains study about
6 the mineral resource in the Henry Mountains that my
7 client has done. Correct?
8 A Yes.
9 Q Are you aware of any requirement that this
10 Board has ever imposed or the NRC has ever imposed
11 that a study like that that focused on economics has
12 to be submitted to a Board like this and a profit has
13 to be shown in order for that material to be an ore
14 under the Atomic Energy Act?
15 A I don't believe that the CIM NI43-101 type
16 report is specified. However, as I understand the
17 definition, the by-product material is material
18 derived from the recovery of uranium. And so
19 demonstrating uranium recovery does appear to be
20 directly relevant, and that's one of the types of
21 information found in the performance of the CIM
22 evaluations.
23 Q So whether something is an ore that is
24 regulated under the Atomic Energy Act depends on the
25 market for uranium. So one day a pile of material

1 sitting right here, if the market is up, in your
2 opinion what you would have this Board imply, that's
3 ore. But the next day the market is down, same pile
4 of material is no longer ore. That's what you're
5 saying, isn't it?
6 A No, I don't think that's a fair
7 characterization. I'm saying that you have a grade
8 demonstration and a recoverability demonstration and
9 an economic evaluation that are all part of showing
10 whether a deposit includes ore.
11 I do agree with your characterization that
12 material may move from resource to reserve or from a
13 deposit to ore depending on the change of price, but
14 the other attributes are as important. If the
15 material cannot be demonstrated as recoverable, the
16 price is not the leading factor.
17 Q Okay. Let's try and move a little bit here.
18 Again, if I can get a yes or no, I would appreciate
19 it.
20 Okay. Under this test you want to propose
21 here, in order to define whether something is an ore
22 we're going to have to know both the revenues and the
23 costs of the activity in order to decide a profit.
24 Correct?
25 A After you've determined the

1 recoverability --
2 Q Is there a yes or no?
3 A No, that's not true.
4 Q That's not true.
5 A Because if you can't recover the material,
6 the price is irrelevant.
7 Q So assume we can recover the material. Now
8 we're in a world where we can recover the material.
9 In order to figure out profit which you're proposing,
10 don't we have to look at revenues and costs?
11 A Yes.
12 Q Thank you. Let's talk about the costs a
13 little bit. In your deposition we went through this.
14 You would include labor costs at the mill in doing
15 this analysis. Correct?
16 A Yes.
17 Q Costs from the maintenance staff. Correct?
18 A Yes.
19 Q Costs for salaries at employee headquarters.
20 Correct?
21 A I would include all the costs that are in
22 the standard methods used by accounting firms for
23 evaluation of mining costs.
24 Q Costs for contractors they have on site?
25 A Portions of those costs may or may not be

1 relevant to the cost of the particular material.
2 Q Costs for the receptionist answering the
3 phone?
4 A If that's part of the operation at the
5 facility where this is recovered, that's part of the
6 cost of operation of a mill.
7 Q Costs for security guards that work at the
8 site?
9 A Some portion of those costs, as we discussed
10 at deposition, not every single amount but the costs
11 that are relevant. There's a parsing of those costs
12 for the different materials that might be considered.
13 Q So for this material we're going to have to
14 go through, the Fansteel material, identify these
15 costs -- there are a lot more to run this mill -- and
16 figure out what percentage we're going to say goes to
17 the cost of processing that material. Correct?
18 A Yes.
19 Q And then another cost is the cost they have
20 to pay for consultants and attorneys' fees to proceed
21 with the application. Correct?
22 A If the attorneys are not providing their
23 services pro bono, that's correct.
24 Q And so the longer someone can stretch out a
25 proceeding like this and cut into the -- add up the

1 costs, just by doing that they could make the material
2 no longer an ore.
3 MR. STILLS: Objection. Badgering.
4 Irrelevant.
5 MR. BRADFORD: Sustained.
6 Please move on to your next question.
7 MR. ZODY: Thank you.
8 Q (By MR. STILLS) It's your opinion that all
9 of this information about costs and profit would have
10 to be put into the application to process this
11 material until we call it an ore?
12 A Yes. In my opinion economic evaluation is
13 reasonable information to require of a business.
14 Q You would agree that this test is not a
15 simple black or white test that this Agency could run?
16 A I don't think I would agree with that, no.
17 Q Do you recall in your deposition stating
18 that profitability is not a simple or black and white
19 attribute of a business activity and one would need to
20 know the costs and values of the specific activity as
21 well as the corporate framework or profitability of
22 the organization to evaluate whether the income
23 generated was profitable or not? Do you recall saying
24 that?
25 A Yes.

1 Q Are you aware that this facility, the
2 uranium mill, has never been required to prove that it
3 is operating at a profit in order for its material to
4 be deemed covered under the statute before this Board?
5 A I'm not familiar with the NRC proceedings
6 regarding the IUC operations. I don't see any
7 information regarding the economic parameters,
8 recoverability, or cost of recovering in any of the
9 materials that I've reviewed.
10 Q And you have not formulated any opinion that
11 there's a specific chemical constituent in the
12 Fansteel material that will create an increased risk
13 to health or safety of human health or wildlife.
14 That's correct?
15 A I have conducted no evaluation regarding
16 those matters.
17 MR. ZODY: Thank you.
18 MR. STILLS: Ms. Lockhart?
19 MS. LOCKHART: I don't have anything.
20 EXAMINATION
21 BY MR. STILLS:
22 Q Mr. Robinson, you testified that you had
23 reviewed the administrative record?
24 A Yes.
25 Q Is there any document -- documents in the

1 administrative record that address financial issues
2 concerning the uranium mill that was reviewed by the
3 Division of Radiation Control?
4 A Not that I detected.
5 MR. STILLS: If I may -- and if I could
6 direct the Board to the administrative record DRC IUC
7 page 460 and pages forward, if I can present this to
8 the witness. This may be on your CD rom version. It
9 may not have been produced by the applicant -- or by
10 the parties.
11 Q (By MR. STILLS) Mr. Robinson, could you
12 describe what is on the page that I turned to?
13 Describe the page number.
14 A I'm looking at page DRC IUC 0460. And it's
15 a letter from International Uranium Corporation to the
16 Executive Secretary of the Utah Radiation Control
17 Board on the subject of FMRI alternate feed license
18 amendment application, revision to surety calculation,
19 White Mesa Mill.
20 Q Did you review or at least notice that
21 surety calculation in your review of the
22 administrative record?
23 A Yes.
24 Q Could you turn the page and refresh your
25 memory just a little bit?

1 A Yes.
2 Q Thank you. Go ahead and fan through it if
3 you don't mind. Do you find information in that
4 report concerning labor costs?
5 A I find information in the report that
6 identifies labor costs as part of mill decommissioning
7 activities. I see no other information other than
8 material relating to mill decommissioning.
9 Q But there are financial data in there
10 concerning labor costs?
11 A There is a unit cost for individual laborers
12 and other workers and equipment.
13 Q So materials concerning costs of
14 decommissioning, costs of operation are regularly
15 reviewed -- let me back up. In your experience with
16 uranium mill decommissioning, are the costs involved
17 in any application regularly reviewed and revealed?
18 A Yes. In my opinion in a uranium mill
19 decommissioning or any other modern mill
20 decommissioning the actual costs are critical in
21 calculation of the surety, and the revision of those
22 costs over time the result -- as a result changes in
23 price are typically required so that the surety values
24 are current.
25 Q So is it your testimony that these types of

1 factors that you've talked about earlier are well
2 within the normal types of categories of things that
3 persons regulating a uranium mill would be accustomed
4 to looking at?
5 MR. ZODY: Objection. Compound. Leading.
6 MR. BRADFORD: Sustained.
7 Please ask a single questions.
8 MR. STILLS: Okay.
9 Q (By MR. STILLS) In your experience is it
10 common for regulators of uranium mills to consider
11 matters of costs?
12 A Yes.
13 Q Thank you. I've got one more question for
14 you.
15 MR. STILLS: If I could direct the Board's
16 attention to Exhibit 12 of the Glen Canyon Group's
17 opening brief.
18 Q (By MR. STILLS) Have you got that?
19 A I have that before me.
20 Q Okay. And did you review that in the
21 preparation of your opinion and your testimony?
22 A Yes, I did.
23 Q And could you describe what that exhibit
24 says? Please summarize.
25 A This document is portions of a document

1 called Minerals for Atomic Energy: A Guide to
2 Exploration for Uranium, Thorium, and Beryllium by
3 Robert Nininger, U.S. Atomic Commission, 1954. This
4 document describes the uranium ore minerals and ore
5 deposits. The first sentence on page -- identified as
6 page 24 on ore deposits discusses the characteristics
7 of deposits of atomic energy materials.
8 The second paragraph says, in the middle of
9 the third line, "The question as to whether it is a
10 mineral deposit or ore deposit may be academic, but
11 the definition has already been given: Value. An ore
12 deposit is a mineral deposit that is valued, a deposit
13 or group of minerals from which a metal or metals can
14 be extracted at a profit."
15 The next page, page 25, under -- entitled
16 Uranium Ore Minerals states, "Lindgren describes an
17 ore mineral as a mineral which may be used for
18 extraction of one or more metals.'"
19 Q And when, again, was that published?
20 A 1954.
21 Q Did you testify it was by the Atomic Energy
22 Commission?
23 A Yes.
24 Q When was the Atomic Energy Act passed?
25 A 1946 or '7, as I recall, was the initial

1 date.
2 Q Do you recall if there were major amendments
3 in 1954?
4 A There have been major amendments many times
5 since the original act.
6 Q Is it fair to say that your understanding of
7 the meaning of the word ore is in agreement with that
8 understanding of the word ore as it was used in 1954
9 by a member of the Atomic Energy Commission?
10 MR. ZODY: Object. Foundation. Taken out
11 of context.
12 MR. BRADFORD: Please answer the question.
13 A Yes. And I see on page 25 beginning in the
14 second paragraph, "The uranium content of a mineral
15 does not of itself, however, determine whether it is a
16 uranium ore mineral. If the uranium is present in a
17 mineral in such complex combinations with other
18 elements that it is too costly to extract, or if the
19 mineral does not occur in sufficient quantities to
20 make extraction worthwhile, the mineral is not a
21 uranium ore mineral." I believe that statement is a
22 paraphrase of the opinion I've offered.
23 MR. STILLS: Thank you, Mr. Roberts --
24 Robinson.
25 MR. ZODY: One quick question.

1 MR. BRADFORD: Okay.
2 EXAMINATION
3 BY MR. ZODY:
4 Q Mr. Robinson, in this document do you see
5 any reference to the text of any of the provisions of
6 the Atomic Energy Act?
7 A I don't see any reference to the Atomic
8 Energy Act on the two pages of the document included
9 here.
10 MR. ZODY: Thank you.
11 MR. BRADFORD: Are there any other witnesses
12 for the Sierra Club?
13 MR. STILLS: Check my time real quick.
14 MR. JONES: An hour, 36 minutes.
15 MR. STILLS: I think we'll reserve the
16 balance of our time for redirect testimony later or
17 cross-examination.
18 MR. BRADFORD: IUC?
19 MR. ZODY: If I may just address a
20 procedural issue. We're not quite at lunch. Do you
21 want -- can we break early and pick up and start, or
22 do we want to start a witness and if we have to come
23 back after lunch. I don't know what the logistics
24 are.
25 MR. BRADFORD: I think the arrangements for

1 lunch is that lunch is going to be brought in for
2 those participating here. Is that still the case?
3 MR. FINERFROCK: Yes.
4 MR. BRADFORD: So I think we pretty much
5 need to continue until it arrives.
6 MR. FINERFROCK: It has arrived.
7 MR. BRADFORD: Oh, it has arrived.
8 MR. FINERFROCK: Yes.
9 MR. BRADFORD: Well, then perhaps now would
10 be a good time -- is that what you're suggesting is
11 to --
12 MR. ZODY: I was suggesting that rather than
13 start a witness, stop and start a witness, if the
14 Board --
15 MR. BRADFORD: That's fine. We'll take 30
16 minutes for lunch, and so we'll convene at 10 after
17 12:00.
18 MR. NELSON: Oh, can I -- can I mention
19 something just before -- caution -- if I could caution
20 the Board that -- remind them that this is an
21 administrative proceeding, that you are acting as a
22 judge, that any communications that you have with
23 staff or parties should just be about what their tie
24 looks like or what their hair color is and what
25 they've done on vacation, but you should not discuss

1 what has been the substance of this proceeding or
2 discuss with them individually any testimony.
3 (Lunch recess was taken from 11:35 to 12:09)
4 MR. BRADFORD: Welcome back. We'll begin
5 here with IUC and their first witness.
6 MR. ZODY: The mill calls Jo Ann Tischler.
7 JO ANN TISCHLER,
8 called as a witness, being first duly sworn,
9 was examined and testified as follows:
10

EXAMINATION

11 BY MR. ZODY:
12 Q Good afternoon, Ms. Tischler. Can you state
13 your name for the record, please.
14 A Jo Ann Tischler.
15 Q And, Ms. Tischler, you've filed -- prefiled
16 direct and rebuttal testimony. Is the testimony that
17 you prefiled, direct and rebuttal, accurate?
18 A Yes.
19 Q Can you explain to the Board a little bit
20 about yourself? It's already in the record so just
21 enough for them to understand who you are, what your
22 background is, and your specific areas of scientific
23 focus.
24 A I'm a chemical engineer. I have been for 31
25 years. You can chop my career in thirds. I've done

1 10 years of direct work as an employee at a chemical
2 manufacturing plant responsible for their compliance
3 with regulations. I have since that time done 10
4 years -- about 10 years of work engaged in the
5 remediation of sites under various regulatory
6 regimes -- CERCLA and RCRA, FIFRA and TSCA, which are
7 different regulatory regimes for different kinds of
8 components. In that window, the last 10 years'
9 window, I've also assisted other types of operations
10 in compliance with regulations.
11 Q Who are you employed by presently?
12 A I'm a program manager at Tetra Tech, which
13 is a management environmental consulting company in
14 Denver.
15 Q And what's your education, Ms. Tischler?
16 A I have a bachelor's degree in chemical
17 engineering. I have completed the course work -- more
18 than twice the amount of course work required for a
19 master's degree in either chemical or mechanical or
20 environmental engineering.
21 Q And, Ms. Tischler, are you familiar with the
22 White Mesa Mill?
23 A Yes, I am.
24 Q Can you just give the Board enough
25 information so they understand the level of your

1 familiarity?
2 A I have done contract project work with IUC
3 since about -- when my son came out of kindergarten,
4 1997 or '8, and I have been to the White Mesa Mill
5 several times to do inspection tours, to watch
6 operations and processes. I've had the run of the
7 mill and been able to look at the process from the
8 beginning -- from its feed systems to the tailing
9 systems. I have had access to data from the mill.
10 I've had access to the operation staff and their
11 records at the mill.
12 Q And what types of issues have you analyzed
13 at the mill?
14 A I have assisted over the last 10 years with
15 assessing the chemical composition of a number of
16 alternate feed materials, more than a dozen, I think
17 14. I have looked at their standards with regard to
18 RCRA on the composition. I have looked at in most
19 those cases the composition of the mill's tailings and
20 compared alternate feeds to the tailings to see if
21 there would be appreciable change in the composition
22 of the tailings after the processing of the feed.
23 Q And did you prepare some analyses in
24 connection with the Fansteel license amendment
25 application?

1 A Yes, I did.
2 Q And what were those analyses? Just
3 describe -- they're in the record, too. Just describe
4 what those are for the Board, please.
5 A I did two memoranda that were included in
6 the license amendment application. One assessed RCRA
7 status, and one assessed the chemical compatibility of
8 the feed with the process and with its insertions in
9 the tailings. After that I have filed two -- after
10 that I responded to one request from UDEQ asking for a
11 little additional understanding of the chemical
12 behavior of certain constituents in Fansteel with the
13 liner -- the cell 3 liner materials.
14 Q Let's turn to your March 7, 2005, Review of
15 Chemical Contaminants, FMRI, Inc., Uranium Materials
16 to Determine Potential for Workers' Safety or
17 Environmental Hazards and Compatibility of the Mill
18 Tailings.
19 MR. ZODY: This is attached to the mill's --
20 actually it's attached to Ms. Tischler's prefiled
21 direct testimony, not in the rebuttal testimony, but
22 the prefiled direct testimony of Ms. Tischler. This
23 is at page DRC IUC 357.
24 Q (By MR. ZODY) Ms. Tischler, is that your
25 chemical compatibility memorandum?

1 A Yes.
2 Q What was the purpose of this memorandum?
3 A It -- the purpose of it was to look at the
4 chemical constituents that are in the Fansteel
5 material and look at the part of the place in the mill
6 where they're going to be introduced and the
7 conditions they would experience in the mill to
8 determine whether there would be any worker safety
9 hazards or potential environmental hazards connected
10 to its introduction and processing in the part of the
11 mill it would go through and to look at what changes
12 it might make in the composition of the tailings for
13 each species in this Fansteel mill material.
14 Q And what were your general conclusions?
15 A My -- for the process evaluation my
16 conclusions were that the composition in the Fansteel
17 material was well within the ranges of other alternate
18 feeds processed at the mill, that based on the
19 chemicals in it, it did not pose any worker safety
20 hazards. It was not incompatibility, that is, it was
21 compatible with the mill's process including the most
22 aggressive part of the mill's process. And at the
23 tailings end, it would not make appreciable changes to
24 the composition of the tailings.
25 Q How did you -- on the tailings end, how

1 would you compare the tailings from the -- that would
2 result from the processing of the Fansteel materials
3 with tailings that come from conventional ores?
4 A They're going to be for the most part the
5 same. The Fansteel material itself, it is a tailings.
6 It's already -- by description in the documents that I
7 read for its process history, it itself has already
8 gone through a very aggressive processing with acid
9 leaching, with multiphase extraction which is the same
10 kind of process that the mill does. The difference is
11 that at Fansteel they were focused on certain specific
12 metals that was their market. They looked at tantalum
13 and niobium, and that's what they extracted.
14 The mill would take the same -- those
15 materials that were put in Fansteel's ponds 2 and 3
16 and put them through a very similar process, acid
17 leaching and multiphase extraction, and take a
18 different metal out, in this case uranium, and put the
19 residuals through the tailings.
20 Q And how did you express in numeric terms the
21 changes in concentration? What -- how did you
22 calculate that, and what units did you use? Can you
23 explain that to the Board, please?
24 A In each case what I did was I took the --
25 what data was available from Fansteel, and there were

1 several sources of data. And I took the
2 concentrations that -- for each constituent that was
3 analyzed metals, anions, and organics. I made a
4 conservative assumption that whatever form it's in in
5 the Fansteel material now it will -- it's going into
6 the mill and will be put into the liquid process
7 stream of the mill and that it would stay in the
8 liquid phase and go to the tailings in that phase.
9 We know -- as a chemical engineer, we know
10 that's not really what physically happens in the mill,
11 what happens to this material. But I've assumed that
12 it will go all the way across as a liquid and stay in
13 the liquid phase in the tailings, and then I compared
14 it to what's in the liquid phase in the tailings.
15 Q You mentioned that's conservative. In what
16 way?
17 A Well, several ways. First is that when
18 the -- when it does reach the tailings, quite a few of
19 the constituents won't be in liquid phase, they'll
20 fall out into the solid phase. It's conservative also
21 in the way I used the data -- the numbers that were
22 given to me. The 1993 study used -- did about 24
23 cores over the two ponds that are being considered.
24 And that data -- I used that data.
25 I also used data that came from a subsequent

1 study that was not focused on cleanup. The '93 study
2 was focused on cleanup. The subsequent study was
3 focused on are there -- how can we use this material
4 maybe make some economic recovery as Fansteel's
5 contractor work for them. It did look at some of the
6 same metals. In fact, it looked at them in what form
7 are they, so I could see whether the iron and the
8 specific metals that are in the cleanup study -- some
9 of those we looked at in terms of are they anoxides,
10 and what form are they in. So I used that data as
11 well as.
12 I also was conservative in another way. The
13 Fansteel data, the 24 samples, were inside the pond,
14 but they had about 270 samples analyzing the full
15 suite of the RCRA-required parameters, anions and
16 organics, and so forth around the ponds. So what I
17 did was I took not just the pond data, but I went
18 around the ponds and said if I see a species that was
19 not analyzed in the ponds, I'm going to add it in. If
20 I see a species that's outside and inside the ponds,
21 if the outside number is bigger, I'm going to add it
22 in. But if I see a species outside the ponds that's
23 in the ponds but it's lower, I'm going to leave it
24 out. So I much amplified the level, the numbers that
25 I put in one of my calculations.

1 Also when I looked at the process data, the
2 2000 data that looked at what process parameters can
3 we recover, I did the same thing. They looked again
4 at some of the same metals, so I looked at those and
5 said, okay, if any of those analyses are higher than
6 the approved data that's in the '93 set, I'll use the
7 higher values. If it's lower, I won't include it. So
8 I much overstated what's present.
9 Q And the concentration -- what were the
10 percent changes in concentrations that you predict
11 will be in the uranium tailings cells before or after
12 the addition of the tailings from the Fansteel
13 materials?
14 A The two -- my two major findings were
15 that -- even with the worst case assumptions I could
16 create there was no constituent that would increase
17 more than half a percent. That was the largest
18 increase. And for about six or eight constituents,
19 the actual concentration would go down because the
20 Fansteel metal was lower in a number of contaminants
21 than the tailings. So putting that residual into the
22 tailings would bring concentration of some species,
23 some organics, some metals down.
24 Q The Sierra Club has questioned the 1993 data
25 taken. What's your response to their assertion?

1 A The 1993 data was collected under a fairly
2 exhaustive program in response to an Agency
3 requirement to assess the site for cleanup.
4 Q What agency was that?
5 A The Nuclear Regulatory Commission for their
6 decommissioning a plan. And NRC approved the data by
7 absorbing the results of that data into their
8 decommissioning plan and absorbing that into their --
9 as a condition of their license, so they did accept
10 the results.
11 When I looked at those results, I could see
12 that there was a QA/QC program in place because I
13 could see when I looked down data tables they reported
14 things like this particular constituent in this sample
15 was less than a detection limit. So when I look at
16 that, that tells me they did do a QA/QC program
17 because how would they know it's less than the
18 detection limit unless they state what that detection
19 limit is and recorded it from the lab work.
20 In the last few weeks I had the opportunity
21 to look at the entire remediation assessment report
22 that produced that data. To describe it, I couldn't
23 carry it home. It was stacked and filled a table.
24 And I went through the whole package and pulled from
25 it its raw data that went into the reports that I had

1 at the time of my assessment and the QA package.
2 And the QA package is about 3 inches thick
3 and did do, predictably, what you have to do to meet
4 an NRC requirement for a cleanup, and it was performed
5 by an EPA certified CLT lab. And they did put into
6 that package all the raw sheets -- the data from
7 calibrating instruments, field blanks, labs blanks,
8 duplicates of blanks, calibration standards,
9 duplicates of standards, blind duplicates so the lab
10 didn't know whether the sample was a dup from the
11 field, and so forth.
12 Q And this was because Sierra Club requested
13 the data so you wanted to double-check it basically?
14 A Right. I could already tell from looking at
15 the data itself it had been through a QA process, and
16 I could see because the QA notes, the footers on the
17 table, showed that it was, but I did actually look at
18 it because that was questioned.
19 Q Now, Sierra Club has suggested that there's
20 not been enough characterization of the materials in
21 those two ponds. What's your response to that?
22 A The two ponds were characterized by, as
23 described in several of the reports, 24 cores. If I
24 remember there was -- excuse me, 24 samples. There
25 were eight -- there were five intrusions, five column

1 samples, in one pond and three in another.
2 Each of those column samples was composited
3 in three levels. So each of those columns was not
4 blended all to one sample. Each of them had analysis
5 of the bottom of the column, an analysis at the
6 middle, an analysis at the top, and that created 24
7 samples.
8 I'm a remediation engineer and have been for
9 a long time, so I took -- okay, there's 24 samples and
10 there's reported 16,000 tons of material, which I
11 doubled, which is another way to make my study
12 conservative. I doubled that and doubled all the
13 constituents' masses based on that. So I took
14 16,000 tons of material, 24 samples. Is that
15 meaningful? Is that reasonable?
16 And I looked at from past history of ones
17 I've worked on and ones where -- both where I was and
18 was not doing the field planning for -- I looked at
19 pond closure where there was high organics and low
20 metals and very high metals and low organics. I
21 looked at a few that were CERCLA -- closed under
22 CERCLA, a few that were closed under state RCRA-type
23 programs and said what's reasonable for characterizing
24 a pond that is heterogenous, possibly colloidal, has
25 differences in water levels throughout the pond and so

1 forth.
2 If you do math, for the Fansteel material it
3 comes down to -- they have what we would call sample
4 frequency of one sample in about 600 tons of material.
5 On other sites that are comparable or more complex,
6 I've seen sample frequencies from one in a thousand to
7 one in two thousand tons of materials, including
8 superfund sites, state sites and the like. That was
9 my basis to say that's not a bad cross-section.
10 Twenty-four samples on that mass of material is
11 sufficient because sites that are comparable have been
12 closed successfully on even less data than that.
13 Q Thank you. Turn to page 2 of your report,
14 please. Is there any indication on this page as to
15 whether you relied upon data from the later sampling
16 of the Appalachian Resources Report?
17 A I'm sorry?
18 Q Look at item No. 6, please.
19 A Yeah. No. 6 in this list were the actual
20 data pages, tables, that did come from the Appalachian
21 Resources Report.
22 Q And how many bore holes or samples were done
23 in that report?
24 A There was over 200. And as I described
25 earlier, those are the ones that I took and said if

1 they've hit something that's not present by the old
2 data in the ponds or higher, that's where I took it
3 from was from that report.
4 Q Did you use that data in your tables that
5 you attached?
6 A Yes. The actual numbers in my tables if I
7 actually -- for some of them, if I saw a species that
8 was higher in the Appalachian report, I expanded my
9 range.
10 DR. NELSON: How many of those 200 were in
11 the ponds?
12 THE WITNESS: Excuse me?
13 DR. NELSON: How many of those 200 were in
14 the ponds?
15 THE WITNESS: I'd have to look.
16 DR. NELSON: Roughly.
17 THE WITNESS: The majority of them. Because
18 that was -- there may have been a little bit perimeter
19 work, but those samples were designed to characterize
20 whether the ponds could be reprocessed, so they were
21 focused on the stuff sitting inside the cells.
22 DR. NELSON: Thank you.
23 Q (By MR. ZODY) And your reliance upon that
24 data, as indicated in this report, was submitted with
25 the license amendment application?

1 A Yes.
2 MR. ZODY: I have no further questions.
3 EXAMINATION
4 BY MR. STILLS:
5 Q Good afternoon, Ms. Tischler.
6 A Good afternoon.
7 Q A few questions regarding your testimony
8 today. If you could turn to what I believe is table
9 2.
10 MR. STILLS: For the Board, it's DRC IUC
11 382.
12 Q (By MR. STILLS) It's table 2 in the report
13 you were just discussing.
14 A Yes.
15 Q Are you there? In your deposition you
16 testified that the estimates for the concentrations
17 for the constituents listed here were established
18 based upon the data from the 1993 report. Is that
19 correct?
20 A No. I said that -- there was a pile of data
21 on the table between you and me, and I said my data
22 came from that pile. And that pile included an
23 excerpted data sheet that did include the Appalachian
24 data.
25 Q But to be more specific, you said that your

1 generalized report focused in on those data.
2 A Yes, sir.
3 Q For this table -- I'm sorry. For this table
4 2 did any of the calculations, the mass balance
5 calculations that you did, rely on numbers taken from
6 anywhere other than this -- other than the 1993 data?
7 A Yes. As I said, when there was a value in
8 the later data that was higher, I included it, so I
9 moved my ranges to capture it.
10 Q And when did you receive a full copy of the
11 Appalachian Resources Report?
12 A I had the full sets of the data tables when
13 I did my assessment, and I received a full copy of the
14 balance of the report during, I think, December.
15 Q Of?
16 A 2006. I also had in hand -- when I had the
17 data from the Appalachian, I also had the process
18 description pages from it.
19 Q If I may be clear, we talked during
20 depositions in January of 2005 -- of 2007. Have you
21 received additional pages of the Appalachian report --
22 Appalachian Resources Report since we spoke in
23 deposition?
24 A I can't remember whether I got it -- I
25 believe I had it before that because it was provided

1 to me. I can't remember if it was right before or
2 right after.
3 Q Because this is important because it was
4 represented to the Sierra Club that you only had
5 portions of this report. You had represented to us
6 that in your table that you only had portions of this
7 report, and I'm trying to establish when you actually
8 looked at the full information in the Appalachian
9 Resources Report.
10 A I looked at the full -- the process
11 description and the bolded numbered tables at the time
12 I did my study. Other pieces of that report came to
13 me afterwards that did not affect my study.
14 Q And who provides you the pieces of reports
15 on which you rely to do the analysis for these
16 reports?
17 A There's two ways. When IUC has data already
18 available, they give it to me. When I ask for more
19 data or ask questions or ask for better process
20 background or if I ask to be able to talk to the site
21 representatives, I do.
22 Q But to be specific, didn't Mr. Frydenlund
23 provide you selected excerpts from the Appalachian
24 Resources Report?
25 A Yes.

1 Q The Appalachian Resources Report discussed,
2 and I believe it was your testimony, the
3 recoverability of metals. Did it discuss the
4 recoverability of uranium?
5 A No. It talked about metals. It talked
6 about metals that might be of economic value to them
7 beyond the tantalum and niobium that they had already
8 removed.
9 Q So this report did not recognize uranium as
10 a recoverable or valuable mineral that was worthy of
11 further investigation?
12 A Actually it said there's some valuable
13 uranium here, we're focussing on scandium.
14 Q I don't believe that's what it said, though.
15 A There's text -- said there's other metals,
16 we're looking at scanned uranium.
17 Q Did the Appalachian Resources Report
18 characterize the consistency of these materials?
19 A It talked about them as being pretty
20 variable and heterogenous.
21 Q The Appalachian Resources Report said they
22 would stick to a shovel. Is that correct?
23 A Yeah, that's possible, some portions of
24 them.
25 Q And the Appalachian Resources Report

1 described them as gel-like. Is that correct?
2 A That's what colloid is.
3 Q Excuse me?
4 A That's what colloid is.
5 Q And the Appalachian Resources Report
6 described these waste-in -- I'm sorry, work-in-process
7 materials as sludges. Is that correct?
8 A Yes. I think they used that word, yes.
9 Q The Appalachian Resources Report identified
10 that you couldn't push these -- these materials
11 wouldn't go through a screen, they needed to be forced
12 through. Is that correct?
13 A I don't remember that.
14 Q Okay. Concerning the 24 samples that you
15 took -- or, I'm sorry, that you reviewed, is your
16 testimony that the QC -- QA/QC for these have been
17 done? Is that correct?
18 A Yes.
19 Q And that you had reviewed that QA/QC?
20 A No. My testimony was that there were
21 indicators that the QA/QC was done in the pages that I
22 had as data for my calculations. After my report I
23 did review all of it. I reviewed the QA/QC and all
24 the raw data that was in the binders that generated
25 the tables I used.

1 Q If the Sierra Club had not brought this
2 proceeding, would you have ever reviewed the QA/QC?
3 A Probably not, and it wouldn't have changed
4 anything.
5 Q So the public and the Division of Radiation
6 Control relied on your analysis which had not looked
7 at the underlying QA/QC of the data of which you were
8 basing your consultant's reports?
9 A Yes. And the NRC's own consultant did the
10 same thing.
11 Q If you could turn to DRC IUC 110, please.
12 Perhaps you don't have that. I'll provide you with a
13 copy here in a second. What I'm referring to is the
14 DRC IUC pages 101 through 110, and for expediency it
15 begins on page DRC IUC 18. And if I may without
16 objections just read that it's titled The Review and
17 Evaluation of Characterization Data Provided for
18 Fansteel Corporation, Muskogee, Oklahoma, Submitted to
19 Thomas Fredericks, US NRC, Prepared by HCS Consulting,
20 November 15, 2002.
21 MR. ZODY: What page are you on, Travis?
22 MR. STILLS: I'm on page DRC IUC 0110.
23 Q (By MR. STILLS) Ms. Tischler, could you
24 read -- I'm sorry. I should have noted that number.
25 Could you begin reading where bullet point 6 begins?

1 A "Does the sampling plan address QA/QC
2 requirements?"
3 Q And what does this ICF report state?
4 A It says, "Unknown."
5 Q And the second point?
6 A Excuse me?
7 Q And the point following that, point No. 7?
8 A "Has sampling been conducted in each pond
9 according to the sampling plan?"
10 Q And the response to that by the consultant?
11 A "Unknown."
12 Q So if it's accurate to say that the ICF
13 report -- the 2002 report that I just referred to said
14 that the QA/QC on these materials were unknown, this
15 was in the record and formed the basis of the DRC
16 decision. Would that be accurate?
17 A There's a reason, because page 2 of their
18 report says we didn't look. The reason it's unknown
19 is not because it was unavailable or not done. Page 2
20 said that we took the data at face value, we did not
21 review the QA/QC package. They did not, but I did.
22 Q And this review came last week?
23 A Yes.
24 Q Thank you.
25 MR. STILLS: One moment, please.

1 (Brief pause.)
2 Q (By MR. STILLS) And again going back to
3 the -- your report, when was the last date of
4 processing of the materials at the Muskogee facility?
5 A One of their reports says they reprocessed
6 some materials in the '90s. The last date of process
7 was -- I don't remember, but late '80s or -- the first
8 material and reprocessing in the '90s.
9 Q Is your RCRA analysis based on your
10 understanding that the last processing completed in
11 1989?
12 A No, sir, it's not. My analysis was based on
13 what's in the material, not when it was processed.
14 Q When was the last date of processing in your
15 understanding?
16 A I just answered that, didn't I?
17 Q In the early '90s? Was there processing
18 done after the Appalachian Resources Report was
19 completed in 2000?
20 A I'm not aware if there was or not. I
21 thought it was in the '90s. But my evaluation was not
22 based on dates. My evaluation took the basis that
23 whatever its condition or its standing relative to
24 other regulations -- I'm going to assume that
25 regardless of when it was run that it is subject to

1 RCRA, and I'm going to analyze every single potential
2 RCRA listing or characteristic that could apply it to.
3 I did not assume that dates would change its standing.
4 I assumed it is subject to RCRA, and I'm going to
5 analyze every possible regulatory attachment.
6 Q Did you make the assertion in your report
7 that it's exempt from RCRA?
8 A One paragraph in my report started by saying
9 it's potentially exempt from RCRA based on double
10 amendments regulations and then the next 30-some-odd
11 of my report says assuming that is subject to RCRA I
12 will evaluate all the potential RCRA attachments to
13 it. So most of my -- my report was focused not on it
14 being exempt from anything but that it might be
15 regulated by RCRA, and I needed to see what RCRA
16 listings or characteristics could attach.
17 Q So your report could not be relied upon to
18 make any judgments concerning RCRA exemptions. Is
19 that correct?
20 A No, it can. Because assuming it is subject
21 to RCRA, I evaluated all the listings and all the
22 characteristics that could apply and determined that
23 they don't.
24 Q Which is it? Is it exempt -- do you make
25 the determination it's exempt or do you not?

1 A I determined that it's subject to RCRA, and
2 as a result of a RCRA review, it's not a listed waste.
3 If I had assumed it was exempt, I would not have gone
4 through an assessment to see is it a RCRA waste. So I
5 went all the way through the process to the end saying
6 assuming it is potentially regulated by RCRA, let's
7 look at everything in RCRA that could touch it and
8 found it's not a RCRA-listed waste.
9 Q Just to be clear because it's a bit
10 confusing, no one should rely on your report as a
11 legal conclusion of whether or not these materials are
12 exempt under RCRA.
13 A I'm not a lawyer.
14 Q Thanks. Would the fact that these materials
15 have been processed after the 2002 report have any
16 bearing on their contents?
17 A Yeah, it might. It might make them have
18 fewer contaminants because they were processing to
19 take metals out.
20 Q There was processing after 2000, then?
21 A I don't know what years it was. I told you
22 I don't know the years.
23 Q Did you review the ICF report to see what
24 years they processed?
25 A Yes. And I don't remember the years.

1 Q Was it after 2000 -- was it after the
2 Appalachian Resources Report that that processing took
3 place?
4 A Appalachian is the 2000?
5 Q Appalachian Resources Report in 2000.
6 A I don't know.
7 Q As far as recoverable uranium, did you do
8 any test to determine recoverable uranium in the
9 work-in process materials?
10 A No. That was not the scope of my work.
11 Q Would doubling the amount of materials have
12 any impact on the estimates that you made concerning
13 the uranium content?
14 A I didn't assess uranium at all.
15 Q Did you assess how much uranium from these
16 materials would end up in the tailings cells at White
17 Mesa?
18 A No, and for a reason. I was assessing what
19 materials are not product that would go to tailings.
20 Uranium is product.
21 Q So would it be correct to say that you
22 assumed 100 percent recovery of the uranium at the
23 White Mesa Mill?
24 A No. I know their recoveries are in the high
25 90s or in the 90s for alternate feeds.

1 Q But you just assumed some kind of recovery
2 would happen but you didn't analyze any of the uranium
3 that would go into these materials into the ponds
4 despite the fact that there are uranium found in the
5 groundwater exceedances currently.
6 A That's correct.
7 MR. STILLS: Thank you.
8 MR. BRADFORD: Laura?
9 MS. LOCKHART: No.
10 MR. DeROSSO: I have some questions.
11 MR. BRADFORD: Let's see if IUC has any
12 redirect on this. No? Okay. We'll have Board
13 questions and come back to that. Frank, go ahead.
14 EXAMINATION
15 BY MR. DeROSSO:
16 Q Yeah. I looked at your data -- I'm not
17 going to turn that on again because we're getting some
18 feedback. I want to make sure I'm understanding and
19 reading this correctly. It looks like in the -- in
20 that material, the uranium feed material, you had
21 59,000 parts per million of cadmium?
22 A I need to look at my table. Do you have...
23 Q Table 2.
24 A Yes.
25 Q That seems like a lot of cadmium.

1 DR. NELSON: It's 5.9 weight percent.
2 MR. DeROSSO: I know that.
3 Q (By MR. DeROSSO) That's a lot, especially
4 when you look at the last column, and you say
5 concentration in other ores and alternate feed
6 materials and you have .004 to 16 percent versus
7 59,000 in this feed material. I guess I take
8 exception with your assertion that there are no worker
9 safety issues associated with this. I'm a certified
10 industrial hygienist, and cadmium is a very, very
11 strictly regulated metal. I don't know how you could
12 make that assessment based on the fact that you're
13 dealing with source material that has 5.9 percent
14 cadmium in it.
15 A Yes. The reason was cadmium, like all the
16 other metals, is going to go into the front of the
17 mill in the system where they're going to put a great
18 deal of water in it and will be -- the portions of the
19 mill that it's going to run through the process there
20 are both wet and dry scrubbing systems to control
21 anything that might come off the front end of the
22 process.
23 Cadmium -- the mill processes material that
24 has other metals at those levels as well, some of
25 which have RCRA toxicity, some of which have

1 hygiene-related, industrial-related issues. But it
2 does process metals, and it processes them in a system
3 where they're wet in an acid solution and under
4 control of a vent system that is designed for metals.
5 Q Okay. But I'm not -- maybe you can help me
6 understand these numbers, too. In column F you say
7 estimated current concentration in mill tailings for
8 these various components, and I see 3.4 is the average
9 concentrations of the mill tailings for cadmium, 3.4
10 parts per million. Then you say column I was your
11 concentration of mill tailings after uranium material
12 processing, and that's 1052. Increase, next column,
13 1048 parts per million. Then you say that's a
14 .1 percent increase?
15 A Right. The column I is the concentration.
16 My calculations go through let's take the
17 concentration into the Fansteel metals times its mass
18 and turn it to mass. Then it says let's take the
19 concentration in tailings and turn it to mass. Add
20 the two masses, and then look at the total mass that's
21 in the tailings and calculate its concentration in
22 PPMs and percents. The tailings is a large volume of
23 material.
24 Q Okay. Say that again.
25 A I take what the concentrations are in the

1 Fansteel material.
2 Q Okay.
3 A And they're in concentration units, PPMs or
4 percents. Multiply it times the mass. And I used
5 double the mass. I didn't use the 16,000 tons that
6 were analyzed. I doubled it and said 32,000. That's
7 how I created the 59,000 number. I doubled it. Then
8 I took -- and I multiplied the mass times
9 concentration and I now have cadmium. Then I took
10 what's in the tailings, what's known to be the cadmium
11 concentration in the tailings, and multiplied it times
12 a mass of tailings. And now I have cadmium. So I can
13 add cadmium to cadmium, and I have a sum of cadmium.
14 Then I converted it back to -- this is now
15 what the concentration will be in the tailings by
16 dividing that by mass.
17 Q I follow that. It probably wasn't your --
18 within your scope of work, but would you think that
19 any other worker protection issues are going to be
20 employed at the mill with this material that contains
21 a fairly high amount of cadmium?
22 A The mill makes -- the mill has several
23 mechanisms for worker protection. One is the
24 engineered controls. Those are the air control
25 systems, wet and dry, to control vapors. It has

1 another set of controls. Workers wear -- when it's
2 appropriate, workers wear dust masks and other kinds
3 of physical protection, PPE, when that's necessary.
4 More importantly, though, the stuff is going
5 to immediately as soon as it enters the mill, be in a
6 bath of water and then in a bath of sulphuric which
7 the workers are not in contact with. So the front end
8 of the mill, they don't have a mechanism to be having
9 a direct cadmium exposure. And in places in the mill
10 where any metal with a potential volatility would
11 vaporize, there are air control systems.
12 There's no place where there's an open tank
13 of the stuff sitting there with high cadmium levels
14 where the workers could approach an open tank that may
15 be volatilizing cadmium. Those tanks are closed and
16 they have vent covers and they have a sweep system to
17 an air control.
18 So, yeah, some of these numbers are high in
19 metals, and we expect that because these are materials
20 that was once processed as ore and so it should have
21 metals. That's the business it came from. When it
22 goes into the mill which also manipulates metals,
23 there are controls to make sure the workers are not
24 exposed to metals.
25 Q To your knowledge, did the mill ever process

1 materials that had that level of cadmium?
2 A The only way I can know is from my table.
3 It's processed -- if you look at my table, materials
4 that have other metals at that level but not cadmium
5 at that level.
6 Q Okay. It's an unfair question to ask you.
7 Do you know of any exposure monitoring that's been
8 done for workers at this plant to see what their
9 exposures are to different metals at different
10 concentrations for different feed stocks?
11 A I don't know. I'm not a CIH, and that's not
12 my scope of work.
13 MR. DeROSSO: Thank you.
14 EXAMINATION
15 BY DR. NIELSON:
16 Q Ms. Tischler, I've got a question that goes
17 to the report, the March 8, 2005 report. When you did
18 that report, was it based on an assumption that the
19 tailings impoundments were not leaking?
20 A I didn't assess whether they were leaking.
21 I looked at what was known to be there, what was --
22 from analyses, what was assumed to be present in the
23 tailing. The assessment wouldn't be changed whether
24 the ponds were leaking or not.
25

1 Q Could I ask you to look at No. 6 in your
2 conclusions? It's on page 24 of the report. It's the
3 one that starts out, "There will be no significant."
4 The page -- DRC IUC 0408.
5 A 0408?
6 Q 0408.
7 A I don't have that in this package.
8 MR. ZODY: I don't either.
9 DR. NIELSON: Okay. We've got a different
10 document. This was on the CD. It was from the
11 Division's administrative record, but it's probably --
12 MS. LOCKHART: We have a copy over there.
13 DR. NIELSON: Would it be possible to give
14 her that copy? I'm sorry. Or I can bring my laptop
15 around. Maybe that's easier.
16 MR. ZODY: Can you refer to the page number
17 of the document?
18 DR. NIELSON: DRC IUC 0408.
19 MR. STILLS: We do have a hard copy of that,
20 and it shows page 24.
21 DR. NIELSON: Yes, that's correct. And it's
22 the very end of the conclusions section.
23 A I have a bound set that has lots of things
24 in it. And I don't see well so it's going to take me
25 some time.

1 MS. LOCKHART: Just that page?
2 DR. NIELSON: Just that page.
3 Q (By DR. NIELSON) My question is that
4 conclusion indicates -- well, maybe you could just
5 read it. Maybe that would be easier.
6 A Which one?
7 Q No. 6.
8 A "There will be no significant incremental
9 environmental impacts from the processing of uranium
10 material beyond those that are already anticipated in
11 the environmental impact statements from the mill."
12 Q And No. 7 --
13 MR. ZODY: I'm sorry. I don't know what
14 document this is from. I just want to get on the
15 record it's not from her report.
16 DR. NIELSON: Well, I guess I thought it
17 was.
18 MR. STILLS: It is.
19 THE WITNESS: It's my statement.
20 MS. LOCKHART: This is just the March 8,
21 2005 document.
22 DR. NIELSON: Uranium USA Corporation from
23 Jo Ann Tischler, March 8, 2005.
24 MR. ZODY: I apologize.
25 DR. NIELSON: No, that's okay.

1 MS. LOCKHART: The difficulty is the version
2 you're reading is a version that was e-mailed. We
3 included it in the administrative record --
4 DR. NIELSON: I see.
5 MS. LOCKHART: -- but it's duplicative of
6 another one that the parties have been using. So we
7 have to find that one, and that's in the
8 administrative record somewhere.
9 DR. NIELSON: I apologize.
10 MR. ZODY: Dr. Nielson, I found the page.
11 It's page 22 on my version.
12 MS. LOCKHART: DRC IUC 0378.
13 MR. ZODY: Thank you.
14 DR. NIELSON: Sorry for the -- not realizing
15 you had two different copies of a document.
16 Q (By DR. NIELSON) My question, however, is
17 when you say that -- when you reference that it's
18 consistent with -- what's the wording? --
19 environmental impact statement -- it says, let's see,
20 yeah, that there would be no incremental environmental
21 impact from the processing of uranium material beyond
22 those that are already anticipated in the
23 environmental impact statement. I'm guessing -- I
24 guess I'm wondering why that doesn't all also go to a
25 question of whether -- or an assumption that the

1 tailings impoundment would be able to contain those
2 tailings.
3 Would the environmental impact statement not
4 be assuming that, or is this referencing something
5 else in the environmental impact statement?
6 A This is referencing the base environmental
7 report for the mill done by Danes & Moore. I don't
8 remember the exact year. It was about 1978 or '9.
9 And what I'm saying -- maybe I could have said it
10 clearer. What I was saying is that the Danes & Moore
11 report anticipated what would go to tailings. And it
12 anticipated a certain amount of chlorinated solvents,
13 certain amount of hydrocarbons. It anticipated the
14 presence of some other solvents, metals, uranium, and
15 other species.
16 And what I was saying was that based on that
17 report anticipating already the presence of the
18 various organic and inorganic chemicals and based on
19 my assessment of what -- from the data what chemicals
20 will enter the tailings and at what levels that there
21 was no incremental change.
22 Q Would this recommendation have been
23 different if you knew the tailings impoundment were
24 leaking?
25 A It wouldn't have been because the only

1 portion that I looked at was composition to
2 composition. I didn't look at leakage and physical
3 behavior of the liners.
4 DR. NIELSON: Thank you.
5 MR. BRADFORD: Questions from the Board?
6 DR. NELSON: I've got a couple.
7 EXAMINATION
8 BY DR. NELSON:
9 Q What types of materials were originally
10 milled at Fansteel?
11 A They were some natural ores that had -- they
12 were ores from various parts of the world that have
13 tantalum and niobium which is also called columbium.
14 They also --
15 Q Do you know what minerals they were in?
16 A I don't know the mineral forms.
17 Q Okay.
18 A They also in -- for some years of their
19 operation also took product materials that were -- had
20 tantalum and niobium and redigested them in acid
21 because they had very high levels of tantalum and
22 niobium and recovered the product.
23 Q Okay. Would you care to hazard -- or do you
24 know or would you care to hazard an educated guess
25 what phases are containing some of the species we've

1 discussed like uranium, manganese, and cadmium?
2 A What phases of what material?
3 Q The material at Fansteel in the ponds, this
4 alternate feed.
5 A I don't know the distributions very well of
6 the materials. I took anything that was in any phase
7 whether it appeared in an analysis at the top of a
8 column, middle, or bottom.
9 Q I think you're misunderstanding my question.
10 Is the cadmium present as a cadmium sulfate salt?
11 A It likely is -- there's a couple forms it
12 might be at. Because their process was very
13 aggressive and did aggressive leaching and aggressive
14 oxidation, it would be probably be in an oxide form
15 initially, but the ponds do have -- they're wet.
16 There's some moisture content. So it's probably
17 oxides, oxyhydrase, hydrates. Because the ponds have
18 appreciable sulphuric in them and hydrofluoric, it
19 will also be in salts, which those are not terribly
20 volatile so they'll be in soluble salt forms or
21 precipitated salt forms.
22 Q Okay. So the hydrates you're talking about,
23 these would be dissolved species in the core fluid?
24 A I don't know.
25

1 Q One more question. If I were to take a few,
2 hypothetically speaking -- I hate giving
3 hypotheticals, but maybe you know the answer, maybe
4 there is an answer. If I were to take some samples
5 and, oh, I don't know, do X-ray fraction or maybe look
6 at SCM images what mineral phases are present in
7 solids -- I'm curious to know what the solids are.
8 A Of the Fansteel material?
9 Q Uh-huh (affirmative). Are they clay
10 minerals? Are they going to be alkaline or salts,
11 amorphus solids?
12 A I don't know. I know that in the one study
13 where they did try to look at what form are they in,
14 because we look to know can we pick up and reprocess
15 them, there were some oxides, there were some hydrated
16 oxides. It didn't have -- there were a lot of
17 silicates and a lot of inerts. That's as much as I
18 know.
19 Q But you don't know what those silicates are?
20 A No, I don't.
21 DR. NELSON: Okay.
22 MR. BRADFORD: I think we're back to IUC
23 redirect. Do you have any follow-up there?
24 MR. ZODY: No.
25 MR. BRADFORD: You can call your next

1 witness.

2 DOUGLAS B. CHAMBERS,

3 called as a witness, being first duly sworn,

4 was examined and testified as follows:

5

EXAMINATION

6 BY MR. ZODY:

7 Q Dr. Chambers, good afternoon. Could you

8 state your name for the record, please.

9 A Douglas B. Chambers.

10 Q And, Dr. Chambers, could you do something

11 similar to what Ms. Tischler did, explain for the

12 Board your experience, your education, particularly

13 focusing on matters relating to this uranium mill

14 proceeding?

15 A Fine. I'm a physicist by training, Ph.D. in

16 1973. Subsequently I've taken graduate courses in

17 statistics, biostatistics, air quality, and other

18 things. I taught various courses at university, am

19 currently external advisor on two Ph.D.s, I guess it

20 is right now, in the Department of Epidemiology and

21 Biostatistics at the University of Toronto.

22 Q Mr. Chambers, maybe speak up just a little

23 bit more.

24 A Okay. That's not a problem. It sounds

25 quite loud in this area, but I'll try to broadcast a

1 little bit.
2 Q Maybe I'm in a sound hole over here.
3 A Okay. Basically for more than 30 years I've
4 been in the environmental consulting business. And
5 starting about 1974 was one of my earliest experiences
6 in uranium mining and milling, and this was in the
7 Elliott Lake region of Ontario. And at that time we
8 were interested in reopening the Elliott Lake mines
9 because of the increased demand at the time for
10 uranium. So we undertook very extensive, basically
11 three and a half year environmental assessment of -- I
12 think it was 111 different properties in Elliott Lake.
13 Subsequently I had the opportunity to work
14 as an advisor to a panel that was reviewing the Cluff
15 Lake Mine that was the first of the high grade -- when
16 I say high grade, we're not talking fractions of
17 percent, we're talking 10 percent or more, very, very
18 rich materials.
19 And since that time I've been involved in
20 all of the high grade minds in Saskatchewan in terms
21 of both environmental studies and particularly in
22 terms of design, radiation protection and industrial
23 hygiene practices for people working at these mines
24 underground and enclosed environment and in milling of
25 these materials.

1 I've also done studies investigating things
2 such as the use of electrostatic precipitators in
3 underground environments to remove the radon products
4 because that's where the damaging dose comes to
5 underground miners. I've also done many studies for
6 government agencies, the Nuclear Safety Commission.
7 I've done those reconstructions for Beaverlodge miners
8 and Port Radium miners.
9 I'm currently one of the lead participants
10 in an update of the epidemiology of Elliott Lake
11 Ontario miners. I've written a regulatory guide for
12 the U.S. NRC on something called uranium hexafluoride.
13 I was involved in the dose reconstruction for the
14 Centers of Disease Control at the Oak Ridge
15 Reservation. I did a study for the Centers for
16 Disease Control on the effect of uncertainty and
17 exposure on epidemiology.
18 We were retained by the Federal Ministry of
19 Environment in Germany immediately after
20 reunification. I was in Germany two weeks shortly
21 thereafter looking at the environmental issues
22 associated with former Russian-German mining.
23 Everybody has probably heard of Wismut. This was done
24 in secret, and I had no idea at the time, to be
25 honest, but Germany after Canada and the United States

1 was the worlds's largest producer of uranium done in
2 secret under rather discouraging conditions.
3 In any event, I continue to be retained by
4 the Federal Ministry of Environment BMU for eight
5 years advising on that remedial program.
6 I've also advised clients on the design of
7 site characterization studies to be used for
8 submission to the U.S. NRC with respect to
9 radiological sites. I've also worked on uranium
10 properties in Namibia and South Africa and Australia.
11 I've been advisor to the International
12 Atomic Energy Agency on a number of issues. I could
13 go on. I think I just might mention one more thing.
14 The last eight or so years I've been a member of the
15 Canadian delegation to UNSCEAR. UNSCEAR is United
16 Nations Scientific Committee on the Effects of Atomic
17 Radiation.
18 It was started in 1955 by the General
19 Assembly of the United Nations and is the lead agency
20 within the UN family to study health effects of
21 ionizing radiation. It's represented by 21 countries
22 including Canada and the United States, Great Britain,
23 France, Germany, and many others.
24 And I had the great privilege in 2000 of
25 being chosen by the committee to write their next

1 document evaluating the levels and health effects
2 associated with exposure to radon. And it was also an
3 honor but in some sense a misfortune because of the
4 time requirement. I was asked by the committee in
5 2000 to update a 1996 document the committee prepared
6 on the effects of ionizing radiation in nonhuman
7 biota.
8 I was a member of NCRP Committee 85 that
9 looked into radon health effects and have also been a
10 member of EPA's Radon Advisory Committee looking into
11 research priorities for radon.
12 I also have done a great deal of work on
13 naturally occurring radiation, including niobium and
14 tantalum ores, and done work for Foreign Institute of
15 Phosphate Research on the use of phosphogypsum as
16 by-product material. I'm not sure what else, but lots
17 of things and lots of clients.
18 Q Thank you, Dr. Chambers.
19 Can you explain your familiarity with the
20 White Mesa Mill?
21 A Yes. For the past three or four years I
22 have occasionally had the opportunity to advise White
23 Mesa Mill with respect to radiological characteristics
24 of alternative feed materials. And for the past three
25 years I've been the external member -- and with due

1 respect, you might use the phrase the out-house
2 consultant, if you will -- on their ALARA review
3 committee.
4 Q What's an ALARA review?
5 A ALARA in radiation business stands for as
6 low as reasonably achievable and then in small print
7 social and economic factors, really practicalities.
8 Every year White Mesa Mill has a thorough -- it's
9 basically like a radiological audit of protection
10 practices.
11 And what we do is we have a tour of the
12 mill, and we go through all the activities and the
13 various places in the mill. We have full access to
14 staff and to all the records, and we look at things
15 such as air place monitoring, worker monitoring,
16 dosimetry reports, environmental data -- do they have
17 high volume data, for example, around the site? --
18 gamma radiation measurements.
19 Basically all the information they collect
20 is reviewed, and this includes operating practices and
21 procedures such as ventilation of workplace practices.
22 And when they do something different, for example,
23 when they process an alternative feed material, the
24 characteristics of that material will be reviewed in
25 order to identify ahead of time whether or not special

1 measures or special protective practices have to be
2 taken into account. And that's done on a case-by-case
3 basis because each of the alternative feeds could have
4 quite different characteristics.
5 Q Can you just give a brief overview of your
6 knowledge of how this mill process works, please.
7 A Very simply, the mill will receive an ore or
8 an alternative feed, and that will be entered into the
9 front end of the process depending upon the particular
10 ore or feed in a different location. If it's a
11 regular ore, it may have to go through a crushing and
12 grinding stage.
13 But in any event, following that it goes
14 into a digestion process which involves sulphuric
15 acid. And then depending on the nature of the
16 materials being processed, it would go through a
17 solvent extraction phase. That's a purification
18 stage. And then uranium will be precipitated. The
19 stuff that's left over, everything that's left over,
20 is called tailings, and that will be discharged to the
21 tailings basin.
22 And if I may, I can't resist -- or I would
23 hate to resist a comment about alternative feeds. At
24 some point in time the niobium and tantalum ores were
25 ores. And unfortunately I'm not a geologist. And

1 these would have been mined using conventional mining
2 techniques and crushed in the ground before they were
3 processed for the recovery of tantalum or niobium.
4 So in essence, what the mill is getting is
5 preground already small material which facilitates the
6 leaching. So it actually makes -- you don't have to
7 go through the crushing and grinding stage. It's
8 already in small particle size.
9 DR. NELSON: Is it not true that an oxidizer
10 is also added?
11 THE WITNESS: Yes, it is. I'm not a mill
12 metalogist, but it's typical to add a chlorate or some
13 other strong oxidite. And that's very common through
14 all uranium mills. And there's two -- typically two
15 kinds of processes: An alkaline leach, which is not
16 relevant here, and an acid leach, which is what the
17 White Mesa Mill is.
18 And I might add, one other thing is I don't
19 know specifically for White Mesa, but over the 30
20 years that I've been working for uranium companies I
21 haven't seen a mill that has a lower recovery than
22 85 percent and any modern mill certainly can recover
23 more than 90 percent of uranium that goes in. So I
24 would hazard a guess that at least 90 percent of the
25 uranium that is entered into the mill with Fansteel or

1 other materials would end up as uranium product
2 material.
3 Q (By MR. ZODY) Dr. Chambers, have you
4 reached -- have you reviewed the records in this case?
5 A I've reviewed some of the records. I've
6 reviewed the application. I reviewed Ms. Tischler's
7 two memoranda and her affidavit. I've reviewed the
8 now infamous safety -- SER. That is what it is, if I
9 remember. And I've reviewed the -- my apologies. I'm
10 not -- I reviewed two documents each from
11 Messrs. Weber and Robinson, I think the original
12 evidence and the supporting. I'm not sure of the
13 proper terminology.
14 And then recently -- I'm not quite sure
15 when. About two weeks ago I was sent -- shortly after
16 it was produced, I was sent a copy of the background
17 groundwater report which I subsequently had a chance
18 to look at.
19 Q And have you formulated any opinions in this
20 case?
21 A I have lots of opinions. Would you like me
22 to go through my opinions, or would you like to ask
23 specific questions?
24 Q Well, first of all, what's your opinion on
25 the sufficiency of the data that was used to do the

1 analyses here?
2 A Ms. Tischler already addressed that. But in
3 my experience in Canada and the United States, and in
4 Europe and South Africa for that matter, typically for
5 the kind of action that we have you'd be looking at a
6 sample point for about each thousand tons. I think
7 that's consistent with what Ms. Tischler said.
8 So I'm not as familiar with the data as
9 Ms. Tischler is, but I looked at 16,000 tons and
10 something in the order of 24 data points, so I thought
11 that was probably a reasonable amount.
12 And in any event the characterization would
13 have been done under an NRC approved plan, and I know
14 there is various opinions on NRC, but they are quite
15 rigorous on how they design and require applicants to
16 evaluate materials.
17 Q Have you reviewed the -- have you formed an
18 opinion on the sufficiency of the analysis of the mill
19 and its application and the DRC and its review?
20 A Yes. In my opinion, the information on the
21 characterization of the materials is adequate for an
22 evaluation of its ability to be processed safely at
23 the White Mesa Mill and have no change in
24 environmental factors.
25 Q Do you have an opinion about whether the

1 tailings from this material is an acceptable type of
2 material to go into the tailing cells?
3 A Yes. It certainly is an acceptable material
4 for the White Mesa tailing cells.
5 Q What about the ultimate conclusion that this
6 material can be processed -- that the DRC has made
7 that this material can be processed without any -- the
8 word is there would be insignificant impacts on the
9 public health, safety, or environment?
10 A I would concur with that opinion.
11 Q Can you explain yours basis for concurrence,
12 please?
13 A Yes.
14 Q If you would like to use a pad or anything,
15 please let me know.
16 A I may go to the pad in a minute here. I
17 looked at Ms. Tischler's memoranda. I think they're
18 March 7 and March 8. And it's quite evident that
19 there's no unusual reactivity that would cause worker
20 problems.
21 I would add in anticipation that uranium
22 mills are closely regulated. The exposure of workers
23 are -- uranium is not only radioactive, it's also a
24 chemical toxic agent. And the measures that are in
25 place, in my opinion, to protect against the

1 radioactivity are also adequate to protect against
2 nonradioactive constituents that might be present
3 whether they're cadmium or chromium or selenium or
4 lead.
5 And these procedures are quite extensive.
6 They're reviewed on a regular basis. And as I
7 indicated earlier, they're reviewed on a case-by-case
8 basis for alternate feed materials.
9 Q Do you have any concern there's going to be
10 a threat to the public as a result of processing these
11 alternate feed materials?
12 A No, I don't. This is for a variety of
13 reasons. First of all, the Board is aware that
14 there's extensive environmental monitoring that's done
15 around the White Mesa facility. And if you look at
16 the -- if you look at the high volume samples which
17 are collected in essence in a ring around the White
18 Mesa Mill, you can't tell -- you can't tell a
19 difference between the results of the high volume
20 samplers that are close to the mill and the background
21 station, and similarly with radiation and other
22 species.
23 We know even within the mill the ventilation
24 has to be quite effective because obviously where
25 there's uranium there's radium and radon. And the

1 workplace radon levels are more than 10 times below
2 their own internal action level which is more than 10
3 times smaller than NRC's requirement.
4 So I'm quite confident it can be processed.
5 It is underwater. The evidence shows that the
6 windblown dust -- because uranium is quite a good
7 marker and the other radium are quite good markers of
8 wind blowing dust.
9 And the other issue that has come up is
10 seepage. I'm not at all convinced that there is
11 seepage. But even if there is -- even if there was,
12 and I don't agree to that, the question is is anyone
13 at harm, and the answer is no, and I'll comment on
14 that very briefly in a second.
15 Is -- I think most people would acknowledge
16 that almost all metals are soluble at low pH. For
17 example, dithorium is soluble at pH's below 3 and a
18 half and essentially is immobile above that. And if
19 you look at the pH's in the monitoring wells that are
20 immediately around the tailing cells, they're all
21 neutral to alkaline. And, therefore, if there was
22 seepage escaping the bottom of the tailing cells, the
23 acid seepage would be neutralized by the alkaline
24 calcareous rocks underlying the cell. And you would
25 have precipitation and stuff. If anything did leak,

1 it would be immobile.
2 I'd like to comment briefly on my opinion at
3 least whether materials are leaking. And typically in
4 the mills that I've seen we use indicators of
5 contributions from process to be species that are in
6 essence mobile in the environment, they move as water
7 moves. And these are typically anions. Cations, even
8 ones that are relatively mobile like uranium, are
9 still retarded. When I say retarded, meaning delayed.
10 If you have uranium species in solution
11 depending on whether it's a clay or sand, there'll be
12 some exchange between -- some transfer of uranium ions
13 from the solution to the matrix in which the solution
14 is transporting. So in effect the rate at which the
15 water that contains uranium is moving will be faster
16 than the uranium would move itself.
17 And so even though -- even though uranium, I
18 agree with this, is relatively mobile for metals, it's
19 not nearly as mobile as something like chloride or
20 sulfate. And I'm assuming that the Board hasn't had
21 the opportunity to see the baseline report.
22 Q The background report has been provided but
23 is rather large. To the extent you could help them
24 understand, that would be appreciated.
25 MR. STILLS: I would like to go ahead and

1 preserve our objections to the groundwater report we
2 put in our briefs. We'll allow you to go forward to
3 decide on it, but I'll just go ahead and preserve our
4 objections concerning the way we see the disclosure.
5 An excerpt does not disclose what he has relied on.
6 Thank you.
7 THE WITNESS: May I continue?
8 MR. BRADFORD: We've noted that. Thank you.
9 Proceed.
10 A Just one example is: I think most people
11 would consider chloride to be a highly mobile species.
12 It dissolves easily. The anion chloride is highly
13 mobile, essentially moves at the same speed in
14 water -- it moves at the same speed as the water in
15 the ground would move.
16 And taking Ms. Tischler's calculations,
17 there's approximately 4600 milligrams per liter of
18 chloride in the tailing spacing. If you look at the
19 data on chlorides for all of the wells, they're all
20 less than 100 all the way around the bottom of the
21 well. And there's no change in location of the
22 chlorides upstream, and downstream conditions -- or
23 locations are the same.
24 So there's no, or at least not visible to my
25 eyes anyway, variability in chloride levels. The

1 chloride levels are essentially 50 to 100 times lower
2 in the groundwater immediately adjacent to the tailing
3 cells than in the tailing cells.
4 DR. NELSON: I haven't seen a map that shows
5 the distribution.
6 THE WITNESS: There are a numbing number of
7 maps in the new report.
8 DR. NELSON: Is this the background report?
9 THE WITNESS: Background report, yes. I
10 apologize. I wasn't smart enough to think of asking
11 for copies.
12 A But there are a number of wells that are
13 upflow, upgradient, a number of wells right at the
14 tailing cells, and a couple of wells downstream. And
15 it is interesting to look at the spatial distribution
16 and the temporal distribution. And in terms of
17 spatial distribution, there's actually, even if you
18 look at upstream wells, two wells that are not too far
19 apart but both upstream, can be different by a factor
20 of two or three quite easily just simply because of
21 very localized conditions.
22 Even in notially homogeneous unit you still
23 have local variabilities, so it's not surprising that
24 the concentrations can change.
25 In any event, it's my opinion from looking

1 at the baseline report that it's highly unlikely that
2 the basin is leaking, and if it is, the leakage rate
3 is very small. And if it were leaking, any of the
4 materials would be highly likely to be immobilized
5 very close to the base of the tailings basins as a
6 result of chemical participation in the matrix that
7 underlies the tailing basin.
8 Q Dr. Chambers, you were starting to go off
9 down a path about the groundwater if something got in
10 it. I don't know if -- have you given the answers --
11 A I think the reality is -- I think the
12 reality is -- I think if the tailings basin was
13 leaking, you would see a large increase in something
14 like chloride, possibly sulfate, right away. Those
15 are relatively mobile. And there's lots of lots of
16 sulfates and chlorides in the tailing basin.
17 You're not seeing this, but it does provide
18 a good monitoring tool. And I would certainly agree
19 with the State's expert that water quality monitoring
20 in the upper horizon is really the best route to go.
21 I think I also just commented that in the event that a
22 leak did occur, it's highly likely in my opinion it
23 would be neutralized and the metals would be
24 immobilized quite close to the tailings basin.
25 And in any event, as a third thing, a leak

1 if it was a -- certainly if it was a large leak would
2 be identified through chloride or other of the
3 ongoing -- and possibly modified in the future
4 groundwater monitoring and corrective action would be
5 taken. If you identify something significant, you're
6 not going to let it go. You're going to fix it.
7 I don't see any possibility of a hazard to a
8 water user, human or animal, downstream, downflow of
9 the site.
10 MR. ZODY: I have no further questions for
11 Dr. Chambers and would offer him to the Board and for
12 cross-examination.
13 EXAMINATION
14 BY MR. STILLS:
15 Q Good afternoon. Are you aware of any firm
16 that has failed to take corrective action upon
17 realizing that they have a problem?
18 A Personally? No, I'm not. But I'm sure
19 there were many years ago.
20 Q Thanks. Quick question -- few questions
21 here. Your review and testimony you provided here is
22 based on the Tischler characterizations of the data?
23 A That's correct.
24 Q And they're based on assumptions that the
25 IUC would have required these things to do?

1 A That's correct.
2 Q They're not based on your actual examination
3 of the underlying data?
4 A No. I have not separately reviewed the
5 underlying characterization data.
6 Q What methodologies did you employ in
7 providing your testimony today?
8 A Methodologies I employed were basically a
9 review of the data and judgment based on experience.
10 Q Okay.
11 A And Ms. Tischler's and other data, the same.
12 Q Your testimony that these were at one time
13 tantalum ores, is it your understanding that now the
14 work-in-process materials -- what do you understand
15 that term to mean, work-in-process materials?
16 A I'll answer your question in two parts.
17 First of all, I do understand the materials to have
18 tantalum or niobium ores. And I think also I may have
19 seen reference to processing of slags at the facility
20 as well. In that case those would likely have been
21 tin slags because tin slags also are known to contain
22 tantalum.
23 Q Those would most probably come from
24 Malaysia?
25 A Thailand and Malaysia, yeah.

1 Q What do you understand work-in-process
2 materials to be?
3 A I really don't have -- I don't have a good
4 understanding of that, and so I feel uncomfortable
5 answering that.
6 Q Do you know how much recovery of the metals
7 was achieved during the processing activities at the
8 Muskogee facilities in the late '90s up until
9 bankruptcy in 2002?
10 A You're talking about recovery of tantalum
11 and niobium?
12 Q Any metals.
13 A As for uranium, I'm not a metalogist. But
14 from -- we're actually doing a study at the present
15 time for tantalum and niobium on the transport of
16 these materials. So I've had the opportunity to talk
17 to producers, and they would expect to recover more
18 than 90 percent of the tantalum and niobium from the
19 raw materials.
20 Q And do you have an explanation for the
21 significant remaining tantalum composition of the
22 work-in-process materials?
23 A No, I don't.
24 Q Are you aware that the work-in-process
25 materials contain, according to 799W, approximately

1 10,000 tons of fluoride?
2 A I believe I read that. I can't attest to
3 the 10,000, but I'm certainly aware it contained a
4 great quantity of fluoride, yes.
5 Q Do you have an explanation why it would have
6 that much fluoride?
7 A It is one of the processes for extracting
8 tantalum and niobium. They're quite refractory
9 materials. And I apologize, I don't know the -- the
10 geological matrix is the digestion of hydrofluoric
11 acid.
12 Q You have described the ALARA committee. Who
13 are the other people on that committee?
14 A The other people on the group -- there's
15 myself and there's two people basically from the mill,
16 one from the mill and one from head office. The years
17 I've been on it Mr. Frydenlund and then the RSO.
18 That's the radiation safety officer.
19 Q Can you give me the names of those persons
20 who are currently on that committee?
21 A I believe that I'm going to be asked to
22 participate in the ALARA review this year.
23 Q Let me rephrase. Who were the people who
24 were on last year's?
25 A Oh, myself, Mr. Frydenlund, and the site

1 RSO. I have to apologize. I have a temporary memory
2 lapse with his name.
3 Q Appreciate that. Are there any members of
4 the public?
5 A No. This is a technical evaluation.
6 Q This is an internal audit?
7 A Yes, it is. This audit is available to --
8 it was previously available to NRC, and it is
9 available to the State. It must be on their records.
10 Q Have you provided it to the State?
11 A I wouldn't provide it to the State. That
12 would be for IUC.
13 Q Do you know whether it's been provided to
14 the State?
15 A No, I don't.
16 Q Are you being compensated for your testimony
17 in this matter?
18 A Yes, I am.
19 Q At what rate?
20 A I believe it's $180 an hour.
21 Q Plus time and a half for hearings?
22 A No. A lot of people do that. I charge
23 straight time.
24 Q Oh, because your expert report said time and
25 a half.

1 A No. I always -- my colleagues make me say
2 it. It's our company policy to charge time and a half
3 because you're removed from other things. But in the
4 perhaps half dozen times -- as pleasant as it is, this
5 is not necessarily fun. I have never charged a client
6 time and a half. It's something I have to explain to
7 my colleagues at the office.
8 Q I appreciate that. But there are no people
9 on the ALARA committee who are not being paid by
10 International Uranium Corporation?
11 A That's correct.
12 MR. STILLS: One second.
13 (Brief pause.)
14 MR. STILLS: I think we're finished. I
15 appreciate your time. Thank you.
16 MR. BRADFORD: Questions from the Board?
17 EXAMINATION
18 BY DR. NELSON:
19 Q Dr. Chambers, are you -- your point is well
20 taken, at least by me, about chloride and sulfate
21 behaving as conservative species. Are you familiar
22 with EH-pH diagrams?
23 A At one time I knew a lot about
24 thermodynamics. I'm not sure I would want to try and
25 do a detailed explanation of EH-pH today. But, yes, I

1 have seen them before. At one time I understood them.
2 Q Because I want to take you a little bit to
3 task on what you said about uranium and other species
4 dropping out of solution due to raising the pH by
5 interaction with calcite. I've got an EH-pH diagram
6 in front of me here, and there's -- under oxidizing
7 conditions up to a pH of about five and a half.
8 The predominant dissolved uranium species is
9 the uranyl ion, UO2+2. At a pH of about five and a
10 half to seven under oxidizing conditions it is uranyl
11 hydroxide which is neutrally charged. At a pH of
12 about seven to eight it's uranyl carbonate hydroxy
13 complex which has a negative charge. And at pH's
14 greater than eight it's uranyl carbonate complex which
15 has a very strong four minus charge.
16 My point being is that in fact you can
17 expect mobility to be maintained by raising the pH,
18 not by lowering it, at least in the case of uranium
19 and perhaps other metals.
20 A Can I comment? Yeah, uranium is one of the
21 few that I'm aware of that is U-shaped, the
22 solubility. You're obviously quite correct, very low
23 pH's and high pH's. Its minimum is in the middle. If
24 you look at the -- if you look at the pH's that are
25 measured around -- at the present time around the

1 bottom of the -- where the wells are installed, the
2 pH's are all neutral. They're essentially all in the
3 range of six to seven and a half.
4 And in order -- typically at a mill in
5 Canada when you discharge from the mill, you would add
6 lime to boost the pH up. But what really -- I
7 probably should have spoken more carefully. What you
8 have with the calcium minerals and magnesium minerals
9 is a buffering capacity that sits in the rock
10 underneath. So in essence, if these rocks are exposed
11 to acidic materials, then they'll try to make them
12 neutral. That's my understanding.
13 So I don't think -- you know, the rocks
14 underneath the -- underneath the tailings aren't going
15 to be a pH of 11.
16 Q Yes. You're correct in that an EH-pH
17 diagram does not predict solubility at any pH. It
18 predicts what the aqueous species will be. You're
19 correct in that.
20 Would dissolution of calcite in the
21 subsurface result in a reduction in volume in the rock
22 beneath the tailings?
23 A It would be converting calcite to gypsum
24 basically. I mean, the acid here is sulphuric acid.
25 That's the reason that the pH is low. If you take

1 sulphuric acid and add limestone, you get calcium
2 sulfate or gypsum, which is itself a solid --
3 solubility product of gypsum.
4 And I hesitate to put this forward. Jo Ann
5 should be up here. It is approximately two grams per
6 liter.
7 Q It's a lot larger than a calcite.
8 A Yeah. So in actual fact -- I would posit
9 that in actual fact you would get expansion and it
10 would tend to plug the pores and actually make an
11 impermeable layer.
12 DR. NELSON: Fair enough. Thank you.
13 DR. NIELSON: I guess I have a question for
14 Counsel for IUC first of all. Will there be another
15 witness that is -- would be more appropriate to
16 address questions regarding the groundwater report?
17 MR. ZODY: I don't believe so.
18 DR. NIELSON: Okay. Mr. Chambers, maybe if
19 I could ask you --
20 MR. ZODY: Sorry.
21 DR. NIELSON: I'm sorry.
22 MR. ZODY: Let me be a little more specific.
23 Dave Frydenlund was involved in working with the
24 consultant who prepared the groundwater report, has
25 knowledge of it in that sense if you're looking for a

1 general knowledge. But if you're looking for the
2 scientific side of it --
3 THE WITNESS: I should acknowledge I'm
4 limited to having my opinions from reading the report.
5 To that extent I think I understand, and I'm happy to
6 answer your questions within that acknowledgment of my
7 limited knowledge about the details.
8 EXAMINATION
9 BY DR. NIELSON:
10 Q I guess you don't have a copy of the report.
11 A There's a copy in the box there.
12 Q I'm looking at page 2 of the executive
13 summary at the very top of the page.
14 A Roman two.
15 Q Little I two, yes. The first complete
16 sentence there starts, "It is therefore." Are we on
17 the same page? Second page of the executive summary
18 at the very top.
19 A "It is therefore not possible."
20 Q "It is therefore not possible to conclude
21 that a mean in excess of its respected groundwater
22 standard or an increasing trend necessarily represents
23 an impact for milling activities." As I've read the
24 report, I'm understanding them to be saying because
25 there are higher levels or variable levels of

1 constituents in the soils themselves that you
2 shouldn't necessarily look at those values as
3 representing contamination or leakage from the ponds.
4 A I think that's correct because -- I believe
5 that's a correct interpretation because there is
6 variability within the -- from groundwater location to
7 groundwater location upstream, upflow, and there's
8 also variability downstream. And in some cases
9 there's -- where there's an increase, the increase is
10 larger upgradient, so I'm not sure I want to posit
11 what the mechanism is.
12 But you could have things -- if you had an
13 iron sulphur mineral in a small area, you lower the
14 water table, it's exposed to oxygen, it forms acid, it
15 leaches. So you could have a -- that's a hypothetical
16 process. It's not discussed in here. But I believe I
17 concur with your interpretation.
18 Q I guess the question that raises for me is
19 that having stated that or referenced that I'm
20 somewhat uncertain why you can then turn around and
21 use analyses only to be a representation that there
22 isn't leakage in the ponds.
23 A Well, that's a good question. I think from
24 my perspective -- and I emphasize I'm not a
25 hydrogeologist, but I've had the fortune to work with

1 many. As I said, they would first look at changes or
2 patterns in mobile species and -- because they're
3 strong indicators. And the same thing with fluoride.
4 If you picked up fluoride, that would be a strong
5 indicator as well.
6 But because chlorides are so mobile and
7 there's so much chloride in solution in the -- in the
8 tailing cells that if there was a leak -- when I'm
9 talking about a leak, I'm not talking about individual
10 atoms. I'm talking about something you might have a
11 hope of measuring. Then you should be able to pick up
12 chloride species quickly and easily.
13 So to me a strong indication, and probably
14 the best single indicator, of the leak would be a
15 sudden change or rapid change over one-quarter, for
16 example, in chloride level at a monitored well
17 downstream on the site.
18 Q If a pond had leaked early, would you
19 anticipate that it would continue to leak and continue
20 to have high values, though?
21 A It would depend on -- in my opinion it would
22 depend on the nature of the leak and the size of the
23 leak. You could -- if for some reason or other there
24 was some sort of a structural failure, then I would
25 say no. But if somehow or other -- I'm not sure

1 how -- there's differential settlement or something
2 happened to cause a local tear in the liner, I could
3 visualize through the mechanism such as I mentioned
4 the self-healing process, which I think would not be
5 implausible.
6 I don't think there's a universal answer,
7 but if there was a significant leak, you would expect
8 to be able to still see it.
9 DR. NIELSON: Thank you.
10 EXAMINATION
11 BY MR. JENKINS:
12 Q You mentioned that you performed
13 radiological assessments for employees within the
14 plant as part of your ALARA review in your overall
15 consulting position. Do those also include
16 participation in the off-site assessments as well?
17 A We have reviewed both the in-mill and --
18 you're talking about the environmental monitoring?
19 Q Yes.
20 A Yes. Both of those are considered, as are
21 urinalyses and area monitoring and all sorts of
22 things.
23 Q What transport pathways did you review as
24 part of that other than the ones that have been
25 mentioned already?

1 A Well, the monitoring program includes
2 regular high volume sampling. When they're processing
3 uranium, it also includes stack sampling on the
4 yellowcake facility, and it includes vegetation
5 sampling on an annual basis. And I can't recall -- I
6 probably should know, but I can't recall, whether
7 there's soil sampling. But certainly there's a radon
8 monitoring in the mill, which is very low. There's
9 dust sampling at high volume sampling around the mill,
10 and there's vegetation sampling.
11 Q As part of that you mentioned that those are
12 available at the request or -- if they're submitted, I
13 don't know, automatically to the State. Does that
14 include the assessment to, say, a maximally exposed
15 individual from all sources? And if so, can you speak
16 to what those impacts were assessed to be?
17 A The -- basically if you look at the data --
18 imagine a hypothetical individual that lives basically
19 immediately approximate -- immediately adjacent to the
20 White Mesa property. The only way to -- there's no
21 way that I can conceive of you could actually measure
22 a dose. Would be a hypothetical calculation. So the
23 dose to a maximally exposed individual living
24 approximate to the property and breathing and hand to
25 soil and this kind of stuff would be within the normal

1 range of variation in background radiation you would
2 expect anywhere in the area.
3 Q Did that include tissue samples from game
4 animals?
5 A No. That's done by calculation. I don't
6 recall tissue samples of game animals.
7 Q That was the calculations were based upon on
8 that found in on-site water and vegetations.
9 A Based on concentrations from -- are the
10 measured concentrations or calculations made with
11 programs.
12 MR. BRADFORD: Redirect?
13 MR. ZODY: I couldn't even begin to try and
14 ask a question that would make sense after hearing all
15 that, so I'm not going to.
16 MR. BRADFORD: Okay. Then thank you,
17 Mr. Chambers.
18 THE WITNESS: Thank you very much.
19 MR. BRADFORD: Let's take a 10-minute break.
20 We'll reconvene at 2:00.
21 (A recess was taken from 1:54 to 2:03)
22 MR. ZODY: I'm going to apologize to
23 Dr. Nielson. I think we do have one more witness who
24 can answer scientific questions about that issue. I
25 forgot we had -- in the confusion all the people we

had in here, we've got Mike Taylor. And the mill calls Mike Taylor.

MICHAEL J. TAYLOR,

called as a witness, being first duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. ZODY:

Q Good afternoon, Mr. Taylor. Would you please state your name. And try and speak up. The vents are kicking in. I'm maybe the only person who can't hear very well in here.

A My name is Mike Taylor, Michael J. Taylor.

Q And, Mr. Taylor, explain for the Board your education, your background, your experience so they can understand who you are and what your areas of focus are?

A My education is -- I have a Bachelor of Science Degree and Master's in Civil Engineering from Carnegie Institute of Technology and Carnegie Mellon University out of Pittsburgh. I'm currently the General Manager and Vice President of ERM Remediation and Construction Management for the Rocky Mountain Region.

That's a subsidiary company of Environmental Resources Management, ERM, that -- my small company

1 within the company handles all the design -- design
2 construction and construction projects throughout the
3 western United States in the Rocky Mountains. Our
4 work is mainly with waste, environmental projects,
5 remediation, some mine waste tailings, et cetera.
6 And I've been involved in -- we continually
7 work on various different types of environmental
8 projects primarily in the design and construction
9 area.
10 Q Thank you. About how many sites would you
11 say you've been involved with or worked on over the
12 years?
13 A Almost too many to count. As you can tell,
14 I have been around quite a while and have been working
15 on different types of waste sites from coal refuse
16 piles back in Appalachia to hard rock mining waste
17 piles. In the late '70s and early '80s I did a lot of
18 work throughout the western United States in uranium
19 tailings disposal areas.
20 During the active period, I've worked a lot
21 in the design of the actual disposal areas such as
22 they were at that time, and then when the uranium
23 market went down, spent a lot of time in the actual
24 reclamation -- design and construction, reclamation,
25 closure of many of the tailing sites. So the number,

1 I don't know, I would hate to guess, but it's in the
2 hundreds of different projects that I've worked on and
3 still have quite a few currently out.
4 Q Thank you. Do you have any experience with
5 the White Mesa Mill?
6 A Yes. In fact, as the --
7 MR. FINERFROCK: Mr. Zody, I would like to
8 change out his microphone. It's showing red, which
9 means the battery is going down. Do you mind if we
10 take a moment?
11 MR. ZODY: That's fine.
12 (Brief pause.)
13 A Yes. In the late 1970s I was working for a
14 firm of consulting engineers which was one of the
15 premier geotechnical waste design environmental
16 management companies in the country at that time. We
17 were retained by Energy Fuels to design the tailings
18 management system at the White Mesa Mill, and I was
19 the project manager on that project and supervised the
20 engineering and participated in the engineering and
21 the overall construction and observation for cell 2.
22 And so that's the involvement I've had with
23 the mill and have had a chance to look at some of the
24 data over the years as this tailings disposal facility
25 has been in operation, including some -- I gave an

1 affidavit on the alternate feed in 2002 and have had a
2 chance to work with IUC now on this current amendment
3 application including reviewing some of the current
4 data that has been made available to me as part of
5 this process.
6 Q And, Mr. Taylor, I'd like for you to explain
7 for the Board sort of the design of the tailing cells
8 and concept of the design. And you sort of mentioned
9 to me before this the three components of how you
10 measure an engineering project. I want you to discuss
11 that.
12 You're welcome to use the white Board or
13 paper, but feel free to sit as well.
14 A I might get up. I'm a professor at heart,
15 so I might get up and draw on the Board.
16 Really with any engineering project
17 including remediation projects and designer waste
18 disposal areas, et cetera, there's really three things
19 you look at. This applies to bridges and buildings,
20 et cetera.
21 First you design the project based on what
22 you know about the materials, the site, the
23 capabilities of the site, what's going on in the
24 industry at that time, and put together some good
25 plans and specifications. The second part is the

1 construction. You want to build your facility or your
2 structure, whatever you're doing, in accordance with
3 plans and specifications. You modify it based on what
4 you see at the site.
5 And then the third thing is you observe its
6 performance. And really the third case is -- the
7 third portion of an engineering project is really the
8 proof in the pudding. Does the bridge stand up? Does
9 the building stand up? Does the waste disposal
10 facility work without causing significant damage or
11 impact to the -- to human health and the environment?
12 I think really looking back at the -- at the
13 White Mesa Mill cells and design, we have several
14 concepts we worked at in order to try to design a
15 facility that was going to work fairly well. As in
16 most designs for waste disposal facilities, we talk
17 about a liner, and we incorporated one in this design.
18 But I will say at that time, in the late 1970s, early
19 1980s, there were a lot of uranium tailings disposal
20 facilities out there that were operating without any
21 kind of liner.
22 One that I was working on at that time was
23 the Western Nuclear facility up in Jeffrey City,
24 Wyoming. And they were losing tens of thousands of
25 gallons in acid water which was tailings fluid, and

1 they called us in -- we got called in because there
2 was a dam failure on one of their dikes. We fixed
3 that up. They said we're getting ready for a license
4 amendment. Why don't you look at some of the
5 environmental?
6 We put some wells around the facility, and
7 lo and behold, there were no contaminants in the
8 wells, and we weren't very far away from this big pond
9 that was just leaching all kinds of water. Well, we
10 did some work on it and found out that what was
11 happening, as Dr. Chambers mentioned, is that the
12 tailings fluid was actually being neutralized right
13 underneath the pond. Within a very few feet
14 underneath the pond the pH was going up, and metals
15 and things were dropping out in that area underneath
16 there, and the water was actually fairly clean a
17 distance from the pond.
18 We wrote papers on that. Several other
19 people wrote papers on that, and they began to
20 understand this was a mechanism that was occurring
21 throughout the -- really throughout the western United
22 States primarily because of the calcareous --
23 carbonaceous measure of the subsurface environment in
24 the western United States. It wouldn't work in places
25 where you had low parts sand and -- places back East.

1 You had to have to have that interaction, low pH water
2 with the carbonaceous environment.
3 How does that carry back to looking at the
4 cells that were designed for the White Mesa Mill?
5 Well, we didn't want to let all this water seep out
6 because we didn't think that was such a good idea. We
7 said let's put a liner in. We chose the PVC because
8 of the capabilities it had and the technology at that
9 time.
10 We bedded it between a foot and a half to a
11 foot of soil on top and a 6-inch prepared sand bed
12 underneath. Granted, it's a thin layer. 30-mil PVC
13 is not the big, thick huge liner, but it's wedged
14 between two layers of material to keep it fairly
15 steady.
16 Then we said, well, okay, that's -- that
17 should stop most of the seepage, realizing too that we
18 still had this backup mechanism behind the liner that
19 we were seeing in a lot of the other tailings ponds.
20 We said what happens if -- we've got to make sure we
21 could detect major leaks, really big -- you know, if
22 the thing ruptures totally what are we going to do?
23 So we put a pipe underneath the --
24 perforated pipe underneath the liner to the cell
25 embankment to pick up any kind of big gushers of water

1 that might be coming out of the pond. From what I
2 understand, we've never seen any water in those pipes,
3 so we don't have any major, big gushing leaks.
4 The third part of the design we were talking
5 about was let's monitor -- put another monitoring
6 system in, and we went and developed a monitoring
7 system for the shallow aquifer. First off, we were
8 going to monitor the shallow aquifer and the deep
9 aquifer. We put some wells really deep, and
10 eventually the NRC said, well, it's kind of crazy,
11 nothing is going to get down that far, so we just
12 monitored the shallow aquifer. And today we're still
13 talking about monitoring the shallow aquifer.
14 And so we had a system of a liner. To some
15 extent we don't have a leak detection system, but we
16 did for a big massive amount of flow that could have
17 come through the liner. And we did have monitoring
18 systems for the shallow groundwater.
19 So what else? I think the final part of
20 this was once the solid cells were filled, then we had
21 designed a cap to minimize infiltration and -- over
22 the long term because these are geologic disposal
23 areas so we didn't get infiltration of water that
24 would move through the tailings. And that's in sum
25 and substance what the overall design is.

1 Q Were QA/QC procedures followed during the
2 construction?
3 A Yes. QA/QC procedures were involved. They
4 were documented in construction reports that were
5 reviewed by the NRC. The NRC had people come out
6 during parts of the construction and observe it. The
7 liner was made by BF Goodrich. It had manufacturing
8 handling and shipping controls. There were records in
9 the construction report about all the testing that was
10 done on the liner to make sure it met ASTM
11 requirements, et cetera.
12 And so it was installed. QA/QC was done.
13 We did testing on compaction. We did grain-sized
14 testing on the venting material. So, yes, there was
15 quite a bit of QA/QC done during actual construction.
16 Q This cell was designed to receive uranium
17 mill tailings. Correct?
18 A Pardon me?
19 Q Excuse me. The cells at the site, cell 3 in
20 particular, was designed to receive uranium mill
21 tailings?
22 A Yes. It was designed to receive uranium
23 mill tailings with certain low pH water and various
24 characteristics.
25 Q And have you reviewed the analysis done by

1 Jo Ann Tischler of the constituents that will be the
2 tailings from the Fansteel material?
3 A Yes, I had a chance to review that and look
4 at her conclusions.
5 Q And what's your reaction or opinion to the
6 suitability of putting the gradient mill tailings
7 coming from the mill from the Fansteel materials in
8 these tailing cells?
9 A Jo Ann, I think, did a professional job in
10 looking at the Fansteel materials. She concluded that
11 adding it to the tailing cells would not increase the
12 concentrations of any of the constituents by, I think
13 she mentioned, more than about half of one percent,
14 very low. And the pH water would still be -- the
15 water would be still low pH which exists now.
16 And I think I indicated in my reporting,
17 with that amount of change, it wouldn't really change
18 any of the design considerations, and so the system
19 should function as originally designed.
20 Q Mr. Weber, if we assume on the one hand the
21 tailing cells -- not Mr. Weber. Pardon me. Let me
22 start that question over.
23 A I appreciate that. It's getting late in the
24 afternoon.
25 Q We'll come at this from a different angle

1 with the right witness. Have you reviewed the
2 background baseline study, the background groundwater
3 condition study?
4 A Yes, I did get a chance to look at that and
5 review it, and I think it's a very professionally
6 prepared report. I certainly couldn't go through all
7 the detailed data, but it was very well done and quite
8 thorough in the way they looked at the groundwater
9 data historically.
10 Q And what do you draw from that report
11 relative to how the cells are performing?
12 A Well, I think I kind of draw the same
13 conclusion that they did in that it's -- the
14 groundwater is background, and it's just not very good
15 water either upstream or downstream of the cells. I
16 don't like to say this, but throughout the West
17 shallow groundwater typically is not very good. It
18 does have high TDS in it, and it does have leachable
19 metals, et cetera. So that's not surprising that you
20 would see this kind of variability in constituents in
21 the groundwater.
22 I think Dr. Chambers indicated, too, if in
23 fact we had leakage you would be seeing what is
24 commonly referred to, I'm sure you folks know, as a
25 plume downstream. You would see some indicator

1 species showing up as a plume down from the pond.
2 That doesn't seem to be the case.
3 We don't see those indicator species. And
4 I've worked on a lot of projects where we didn't have
5 this mechanism going on in the subsurface environment
6 where the pH was being raised. And when you have
7 stuff coming off the site, you'll see a very
8 definitive plume in the downgradient direction. We
9 don't see that here. We see groundwater with fairly
10 low concentrations of various metals and TDS and other
11 things that kind of fluctuate with the season or
12 whatever else.
13 MR. ZODY: I believe that's all I have for
14 Mr. Taylor, and we'd offer him for questions from the
15 Board and obviously cross-examination as well.
16 EXAMINATION
17 BY MR. STILLS:
18 Q Good afternoon, Mr. Taylor.
19 A Afternoon.
20 Q Looking over your shoulder at the time we've
21 got. I just wanted to start with a couple of
22 questions. How many mills did you say you worked at
23 in the '70s and '80s?
24 A I think the number -- I don't know exactly
25 what the number is. I think I probably worked in 80

1 to 90 percent of uranium mill tailings of facilities
2 throughout the United States at that time.
3 Q About how many would that be?
4 A Probably 10 or 12.
5 Q And how many of these mills are still
6 operating?
7 A Pardon?
8 Q How many of these mills are still operating
9 in the United States?
10 A I think most of them are shut down.
11 Q Are they undergoing decontamination?
12 A They underwent closure.
13 Q Concerning your testimony about the liners,
14 did the companies provide any guarantees concerning
15 the liners that were used at the IUC mill?
16 A BF Goodrich did provide a warranty.
17 Q How long was that warranty?
18 A I don't recall. I think it was like two to
19 three years. It could have been longer. You would
20 have to look back in the records.
21 Q The manufacturer of the liner no longer has
22 liability for the leaks?
23 A No, I don't believe so.
24 Q And the people who installed the liners, are
25 they faced with any liability should there be any

leaks or problems?

A I don't believe so. That contract was written between Energy Fuels and the contractor that installed the liner. But I don't believe they have a liability. I believe that the way the contract was set up was BF Goodrich was the installer of the liner.

Q So based on your involvement, you have no personal exposure or liability --

A No.

Q -- for the leaks? Concerning the -- these liners with the two- or three-year guarantees, what's the effect of exposure to air and sun for these PVC materials that were used?

A PVC is a material -- I think if you look back in the engineering design report we looked at several different types of liners for the facility. PVC is a good material if you keep it from having exposure to sunlight. It will deteriorate with time under sunlight. That's why when we put it in we designed it to have a one to one-and-a-half foot cover on the PVC so that it would not be exposed to sunlight or to incidental damage.

Q Have these liners been protected from sunlight for the past 26 years?

A Have they what?

1 Q Have they been protected from sunlight for
2 the past 26 years?
3 A I think you'd have to ask the folks that
4 operate the facility. It's my understanding that the
5 cover has been maintained on the liner.
6 Q But you have no direct information one
7 way --
8 A No. I have not inspected myself.
9 Q And I'm looking at your written expert
10 testimony, which I believe we're all somewhat
11 summarizing today, and I believe this was attached
12 to -- it's prefiled direct rebuttal testimony of
13 Michael Taylor, so I believe it's attached to the
14 response brief of IUC.
15 In that report you list a number of
16 references. Do you recall those references?
17 A Yes, uh-huh (affirmative).
18 Q Do any of those references concern
19 groundwater?
20 A Concern groundwater? Can you define concern
21 groundwater?
22 Q Do they have anything to do with
23 groundwater?
24 A Well, the design of the tailings cells, yes,
25 definitely concerned groundwater. Liners, leak

1 detection systems, monitoring wells -- I think there's
2 one report that talks about the proposed monitoring
3 well system for the site. Those all relate to
4 groundwater.
5 Q In the list of references that you depended
6 on for your testimony, aside from the 2007 background
7 water quality report, no reference in here is more
8 recent than 1984. You've not done any examination of
9 those interim years in any of the reporting data that
10 has been provided by the Division of Radiation Control
11 to IUC?
12 A No. The only involvement I've had since the
13 finalization of the design and construction in '84 was
14 in 2002 I was asked to look at some of the existing
15 data and talk about the design of the facility. So in
16 the interim, you're right, I have not been involved in
17 the project.
18 Q So your testimony is only concerning what
19 you might have known about the installation. Is that
20 correct?
21 A Could you repeat the question?
22 Q Your testimony here today only concerns
23 those things that you may have known about the
24 installation of the liners?
25 A My testimony is -- has to do with the design

1 of the facility, the choosing of the liner, and the
2 construction of the liner.
3 Q Does it concern the actual installation of
4 the liner?
5 A We had under my supervision -- I believe it
6 was in pond 2 we had representation on the site during
7 installation of that liner.
8 Q But you were not on site.
9 A I was not on site. I had a project engineer
10 that was on site.
11 Q So you -- so your testimony is basically
12 hearsay, someone else told you about what happened
13 there as far as installation.
14 A I had an engineer on site reporting to me,
15 providing me daily reports of what was going on. I
16 did not personally inspect the liner installation.
17 Q So you've reviewed some reports, but you
18 don't have direct knowledge of what went on during the
19 installation of cell 2.
20 A Well, in typical engineer project, direct
21 knowledge I suppose -- did I actually look at the
22 liner going in, no. But I had responsible employees
23 reporting to me as to what was going on, making
24 recommendations, and it was a team effort. I was not
25 on site during that installation.

1 Q Were there any puncture reports?
2 A Sorry?
3 Q Were there any reports -- puncture tests
4 conducted during that installation?
5 A Can you define puncture tests?
6 Q Is that a typical test you would use on a
7 liner to determine if there had been any puncturing of
8 the liner?
9 A Well, BF Goodrich took samples of the liner
10 and had them tested for tensile strength and other
11 requirements of ASTM for liner installation, if that's
12 what you're referring to as puncture testing.
13 Q Perhaps I need to clarify my question a bit.
14 Were you aware of any efforts that were undertaken
15 during installation to determine whether or not the
16 liners were punctured in the process of installation?
17 A I mean that's part of QA/QC. You inspect --
18 the bedding was inspected very carefully by ourselves,
19 the NRC, the liner installer, BF Goodrich. Then the
20 liner was installed. It was inspected. The seams
21 were tested. Swatches of the liner were taken and
22 tested by BF Goodrich. I think that's all in the
23 construction report. So, yeah, there was a
24 considerable amount of effort that went into
25 overseeing the installation.

1 Q I'm referring to DRC IUC DISC 0686. This is
2 Loren Morton's memorandum of June 27, 2000. I think
3 it's also attached to our brief as an exhibit. I'll
4 read from that page. "Review of the IUC engineering
5 design reports show that no FML puncture tests were
6 conducted on any of the PVC FML materials installed in
7 either cells 1 and 2 or 3." I have left out the
8 cites. Do you disagree with that statement?
9 A Again, I'm not sure what -- is there an ASTM
10 standard for a quote/unquote puncture test? We did
11 all the testing required by ASTM, NRC, and others
12 required at the time of installation. What a puncture
13 test is I'm not -- you would have to quote ASTM.
14 Q But your testimony is not based on direct
15 knowledge, and your testimony here is not based on any
16 knowledge of cell 3, is that -- of the actual
17 construction of cell 3. Is that correct?
18 A On the construction of cell 3?
19 Q Cell 3, yeah. You weren't involved in that,
20 were you?
21 A No, I wasn't involved in construction of
22 cell 3. I was involved in the design.
23 Q And cell 1, were you involved in any way in
24 the construction of cell 1?
25 A No, not in cell 1. Cell 2 --

1 Q Your testimony strictly concerns cell 2?
2 A Well, my testimony is regarding the
3 construction as related to cell 2.
4 Q Concerning the liners --
5 A The design of the whole system as well as
6 cell 1, 2, and 3 and the overall concept was under my
7 supervision.
8 Q Again, your testimony is -- concerning the
9 liners, you have no direct testimony here concerning
10 the installation of the liners in cells 1 and 3. Is
11 that correct?
12 A I did not observe the installation of the
13 liners in cells 1 and 3.
14 Q You produced your expert report in
15 December 8, 2006?
16 A Which expert report?
17 Q The one -- did you produce an expert report
18 in December 8, 2006?
19 A I think there was -- I believe there was one
20 put together, yeah. Yes, a small report. That's
21 correct.
22 Q That you provided for this proceeding?
23 A Sorry?
24 Q Did you write that in preparation for these
25 proceedings?

1 A There was one, yes, I believe around
2 December 8th and then the most recent one.
3 Q The prefiled testimony. And in the expert
4 report where we're required to make disclosures of all
5 the things we're going to rely on, in there was no
6 mention of any report concerning the current
7 conditions of the groundwater. Had you looked at
8 groundwater conditions at the site?
9 A At that time I had not seen the groundwater
10 report.
11 MR. STILLS: One second.
12 (Brief pause.)
13 Q (By MR. STILLS) Again, it's your testimony
14 today that you have no direct knowledge and are
15 providing no testimony about the current conditions of
16 the cell liners in cells 1 and 3 at the IUC facility.
17 Is that correct?
18 A I would say that my testimony today is an
19 indicator that the designs that we put together in '79
20 and '80 seem to be functioning based on the
21 observations and the monitoring that I have been able
22 to observe. Does that say anything about the
23 condition of the liner? I don't know. That's
24 speculation. But something is keeping those ponds
25 from impacting the groundwater -- the shallow

1 groundwater underneath that area, and I'm sure the
2 liners probably have some role to play in that.
3 Q Have you reviewed the reports that there is
4 an upward trend in uranium in groundwater near cells 2
5 and 3?
6 A I think -- if you look at the background
7 report, I believe they indicate that that is not the
8 case.
9 Q You reviewed no other report except for that
10 background report?
11 A I've looked at the background report, and
12 I've looked at the analysis that was done on the
13 uranium and other --
14 Q I appreciate that. I'm just trying to use
15 our -- I keep looking over your shoulder at our time
16 and trying to use it very economically.
17 You've looked at no other report concerning
18 groundwater other than the background report that you
19 referred to?
20 A That's probably correct. I might have seen
21 some other monitoring data over the year 2002, and I
22 think there's some other groundwater data.
23 Q You've done no current investigations to
24 confirm the current condition of the cells?
25 A I have not personally made an inspection of

1 those cells.
2 MR. STILLS: Thank you very much.
3 MR. BRADFORD: We have questions from Board
4 members. Would you like to go first?
5 MR. ZODY: I have one short redirect. Then
6 I'll be done.
7 MR. BRADFORD: Okay.
8 EXAMINATION
9 BY MR. ZODY:
10 Q Mr. Taylor, is it your understanding that
11 the background groundwater study -- its sole function
12 was to analyze -- it had many functions. But it looks
13 at the data on the site from the inception, doesn't
14 it?
15 A That's correct. It looks at it from the
16 very beginning.
17 Q So that's as much data as there is for this
18 site.
19 A That's correct.
20 EXAMINATION
21 BY DR. NIELSON:
22 Q Mr. Taylor, I have just a few questions
23 about the groundwater report, and I appreciate the
24 opportunity to ask you. You just indicated that the
25 report covers the history of the site. My

1 understanding is that the site was constructed in 1979
2 and that the mill began operating in May of 1980, but
3 all of the data in this background report is 1983 to
4 2006. Do you know why there isn't data from 1980 to
5 1983?
6 A I do not know.
7 Q Do you know if it's available or how it
8 compares to the data that's in this report?
9 A I can't answer that question. I'm sorry. I
10 know the groundwater monitoring system was put in as
11 part of the original initial installation, so there
12 were monitoring wells put in there.
13 Q Are you aware of whether there was any
14 monitoring done prior --
15 A I think there was.
16 Q -- to the construction of the site?
17 A Oh, prior to the construction?
18 Q Yeah, to in fact produce what I'm
19 understanding we're talking about. My understanding
20 is that we're trying to look at what the background
21 was in the soils, and yet all the data I'm seeing
22 isn't background for the soils, it's sometime after
23 the mill operated. So I'm trying to find out what the
24 real background was and if that was considered as part
25 of this report.

1 A I can only speculate on that. I know there
2 was an environmental impact statement done by the NRC.
3 And if I were going to try to look for some
4 groundwater data, you can certainly go back and look
5 at that, see if there was some wells installed prior
6 to construction.
7 Q Is it your understanding that's the Danes &
8 Moore report?
9 A Yes, I believe that is.
10 Q Do you know why there wasn't groundwater
11 data from that report included in this one?
12 A I do not.
13 Q Thank you. You described -- and I
14 apologize, I've forgotten the name of the mill -- a
15 mill that was constructed with ponds without liners.
16 And I think your testimony was that they were leaking
17 out the bottom, when you drilled on the sides of the
18 ponds you didn't see contamination.
19 A That's correct.
20 Q And I think your interpretation was that you
21 were getting precipitation right under the ponds, and
22 so while there may be fluids going through that the
23 cations were getting --
24 A That's correct. That was in Jeffrey City,
25 Wyoming.

1 Q In Wyoming?
2 A Yeah.
3 Q How do you know that that precipitation zone
4 existed?
5 A How do we know? We did take some samples
6 around those ponds, and we found -- that's where it
7 was deposited. That was -- if you look in the
8 reference list I had in my testimony, there's a
9 reference to a paper myself and Dr. Adam Rhea gave
10 around 1978, '79 that discussed that investigation.
11 Q You were actually able to sample?
12 A If you look down the list a little ways,
13 there's another paper that we wrote I think around
14 '84, '85, something like that, where we actually
15 looked at the history from the first time we saw this
16 issue occurring. And we monitored over that period of
17 time and did an assessment in the middle '80s as to
18 what we really saw, and we were still seeing the same
19 thing.
20 Q Are there precipitation zones under the
21 ponds at the IUC mill?
22 A I couldn't say. I would guess there
23 probably are if the liner is leaking. You've got to
24 define leaking too. That's kind of like -- you know,
25 what's the definition of the term? Is it two drops of

1 water? Just a little stream of water? If a little
2 bit of water passed through the liner through a seam,
3 the precipitate probably exists there. It would be
4 very hard to find unless you had to drill through the
5 liner and everything else.
6 My guess is if any of that low pH water got
7 through that liner somehow, that that precipitate
8 probably exists underneath that well.
9 Q What would you expect the water that
10 continued beyond that precipitation zone to look like?
11 What would its chemistry be like?
12 A Well, I think the proof is in the monitoring
13 of the shallow aquifer. I think over the last few
14 years you folks have asked for more monitoring wells.
15 Originally we were putting them further downstream.
16 But you folks have asked for them to be right
17 underneath the dikes. What does the water quality
18 look like? I think I've got the answer. It's in the
19 monitoring wells underneath those dikes, because those
20 are fairly close to the bottom of the pond, and you're
21 looking at that shallow groundwater which has quality
22 as indicated in the report.
23 Q That confuses me a little bit because I
24 thought the point of the groundwater baseline report
25 was to say that any concentrations that we saw from

1 the monitoring were the result of original
2 concentration.
3 A Probably.
4 Q But I thought I just understood you to tell
5 me that whatever we were drilling down and seeing was
6 probably the composition of whatever water would have
7 been leaking through the precipitation.
8 A I see. The question is whether anything is
9 leaking out of the ponds or not. That's a big what
10 if. First of all, we've never seen anything in the
11 toe drains on the embankment, and they've been checked
12 periodically. I think during one of the inspections
13 we pulled -- they looked at them again to see there
14 wasn't any water in them.
15 So let's assume a little bit of water came
16 through the liner somewhere. Who knows? Maybe none
17 came through. Maybe it's perfect. It would trickle
18 out of the liner at low pH and would calcify and the
19 pH would go up, it would deposit. Now the water that
20 kept going now doesn't have anything in it. It's all
21 been precipitated out.
22 Q It wouldn't have high concentrations of
23 anything?
24 A Shouldn't, no, unless it's like fluoride and
25 chloride. It could have concentrations of that

1 because they wouldn't precipitate out. Since we're
2 not seeing them in the groundwater, the amount of
3 water that was getting to that must be very small or
4 nonexistent.
5 Q But in Wyoming you didn't see them in
6 monitoring wells because it was going straight down?
7 A You figure the shallow groundwater
8 underneath the site is fairly massive in extent.
9 Let's say we have a pinprick in the liner. It
10 precipitates up here, but by the time it gets down
11 there -- somebody can take an eye drop and drop in the
12 massive amount of water underneath the site, so you
13 would never see it.
14 Q Thank you.
15 A Does that make sense to you, kind of?
16 Q Thank you.
17 EXAMINATION
18 BY DR. NELSON:
19 Q I'm afraid I have a number of questions, and
20 I'm going to have to preface them that I'm a little
21 puzzled by some of the generalizations that you and
22 Dr. Chambers have made.
23 What was the precipitate? What was the
24 mineral beneath the Wyoming site?
25 A Calcium carbonates.

1 Q It was calcium carbonate, so the uranium was
2 in the calcium carbonate?
3 A No. The calcium carbonate is the natural --
4 Q You stated that the uranium precipitated. I
5 want to know, in what phase did the uranium
6 precipitate?
7 A In what phase?
8 Q What mineral?
9 A I'm civil. I'm not a chemical, so I can't
10 tell you exactly what was happening in terms of the
11 precipitate, what was going on.
12 Q You can tell me what happened, but you can't
13 tell me why?
14 A Well, just basic chemistry. Metals -- with
15 uranium, radionuclides don't stay in solution. As you
16 were indicating before, when the pH goes up from one
17 to two, you get it up four or five, metals don't stay
18 in solution, they precipitate out.
19 Q Actually when the pH goes up the species
20 become neutrally or negatively charged, and they do
21 not sorb.
22 Was the precipitation due to a change in pH
23 or a change in redox conditions? Were you reducing
24 uranium to uranium four plus instead of uranium six
25 plus?

1 A Could have been. I probably don't want to
2 go back and rehash all this. This whole phenomenon
3 was noted back in '77-'78. And if you look at some of
4 the references I have in my testimony -- there's only
5 a few -- this was being discussed by lots and lots of
6 people, and I even pulled up some old references.
7 Dr. Shury out of Canada indicated it occurred, and
8 there was numerous papers written on it. If you want
9 to know what the chemistry was, I can provide you all
10 kinds of papers on it. It's not just something I
11 thought about or looked at at one site. It was an
12 industry-wide phenomenon.
13 Q Okay. I have another question. If
14 interaction with calcium carbonate causes uranium to
15 come out of solution, why are there uranium ore bodies
16 in the Colorado plateau?
17 A I'm sorry, I don't understand.
18 Q My point is: There are uranium ore bodies
19 in the Colorado plateau because uranium has moved, has
20 mobilized.
21 A At some time in the past.
22 Q At some time in the past. Do you expect the
23 aquifer in the perched aquifer beneath the IUC site to
24 be a homogenous and isotropic medium?
25 A No, it's probably not.

1 Q Could that explain some of the differences
2 in the groundwater quality?
3 A In terms of the variability in quality
4 upstream and downstream?
5 Q Yes.
6 A I suppose it could. The most shallow
7 aquifers in the West are not like nice, clean sand
8 beds. They're interbedded silts and clays, et cetera,
9 and they could have different characteristics
10 throughout those different beds.
11 Q I'm frankly stunned that you're making that
12 generalization. And I'm sorry I'm letting my emotions
13 come a little to the surface.
14 I notice in the report that I'm seeing for
15 the first time today, by the way, figure 11 shows
16 gross alpha downgradient of the site actually going
17 down. That's, I think, hard to explain, but it's not
18 indicative of a failure of the liner system.
19 However, I'm looking at -- now at uranium.
20 That's figure 13. In monitoring well 12 in 1983, it
21 was three micrograms per liter. And in 2005 and 2006
22 it's almost 18. Monitoring well 2, it's
23 five micrograms per liter. 2005, 2006 it's almost 11.
24 I see chloride and sulfate going up. I look at the
25 time -- I look at crossplots of chloride versus

1 uranium -- and in support of your interpretation these
2 would be figures like 14 and continuation of 14.
3 I don't see a positive correlation between
4 uranium and chloride which indicates that the two
5 certainly are not moving together in a conservative
6 fashion. My point is -- and I guess I'm getting ahead
7 of myself. If this Board thinks that groundwater
8 quality and whether or not these ponds may have
9 experienced a failure is important to our decision
10 today, then we don't have the information. We haven't
11 been able to digest this, and I find that -- well, I
12 find it -- you know what I find. That's the end of my
13 questions.
14 MR. ZODY: Could I just address you,
15 Dr. Nelson, on that point just briefly? The report
16 was submitted to the Agency at the end of the year,
17 January 1. Sierra Club has made an issue of the
18 groundwater in the case. I felt the report should be
19 provided to try and give the rest of the story.
20 There should be a little reminder here that
21 we've got a groundwater permit that's been issued that
22 licensed these cells. That's already been done.
23 They're legally operating. This particular proceeding
24 is about the Fansteel materials and the addition of
25 those materials.

1 So I understand your concern, and absolutely
2 you should have the opportunity to review that. But
3 that is going to continue to proceed, this other
4 proceeding, because it's specifically contemplated
5 under the groundwater permit. So that process is
6 going to keep going on, and this study will be
7 analyzed for quite some time. I'm sure Mr. Morton
8 will analyze it.
9 But my point is that process is going to go
10 on and continue to go on as contemplated by the
11 groundwater permit. And that was known when this
12 amendment was issued that there's the situation where
13 background has to be addressed and established. And
14 so I just -- to the extent we could focus on the
15 Fansteel part of the addition here --
16 DR. NELSON: I understand that, and I would
17 like to note that you have had experts testifying as
18 to groundwater quality. You folks have brought it in.
19 And my point is if the members of this Board feel that
20 it is necessary for them -- the liner integrity,
21 whether there's a leak or not, is important for them
22 to decide the Fansteel case, they perhaps have been
23 shortchanged by seeing this for the first time today.
24 MR. BRADFORD: I'd like to bring a point of
25 order here. I think this discussion needs to happen,

1 but we need to finish the witnesses, and then we'll
2 have more opportunity for Board members to discuss
3 these items.
4 MR. STILLS: Respectfully, may I have two
5 minutes to, due to what's been raised, just address
6 Mr. Zody's legal argument? I will take a very short
7 amount of time.
8 MR. BRADFORD: Okay.
9 MR. STILLS: Thank you. I appreciate that.
10 Mr. Zody just made the argument that
11 groundwater is irrelevant, don't look at it. It's not
12 relevant to the NCR, it's not relevant to your
13 proceedings, it's not relevant to anything we're doing
14 here today.
15 I want to point to the language from Utah
16 Administrative Code R313-24-3 concerning the
17 requirements for a Safety Evaluation Report which must
18 include the following analysis, part B, Assessment of
19 any impact of waterways and groundwater resulting from
20 the activities conducted pursuant to reliance to the
21 license or amendment. So it's completely relevant
22 today.
23 We put forward in our opening groundwater
24 contamination is ongoing at the site that came up and
25 has been monitored and found after the 2005 permit was

1 issued. It is very much relevant to what we're doing
2 here today.
3 I appreciate you allowing me a couple of
4 minutes to address an argument that was brought up.
5 Thank you.
6 DR. NELSON: And I apologize to the Board
7 and to the Chair for getting ahead of myself.
8 MR. BRADFORD: Mr. Zody, do you have other
9 witnesses?
10 MR. ZODY: I think at the hour that we're at
11 we're going to just proffer them for cross. It's
12 3:00 o'clock already. And I will turn my time --
13 depending on whether or not there's any cross, we're
14 proffering their testimony. It's already been
15 submitted in the record. I will turn it to Laura
16 Lockhart.
17 MS. LOCKHART: Say who your witnesses are.
18 MR. ZODY: Oh, the remaining witnesses:
19 Harold Roberts, Mike Spillman, and Dave Frydenlund.
20 So for the rules of the proceeding we
21 discussed, I proffer them for cross, but I want to
22 allow additional time for the Board.
23 MR. NELSON: What he's saying is that he's
24 relying on the testimony that's in the record and if
25 Sierra Club wants to do any cross-examination of any

1 of those three witnesses now is their opportunity.
2 Is that correct?
3 MR. ZODY: That's correct.
4 MR. STILLS: Can we have just a minute?
5 Would this be a time for a couple minute break, or how
6 are we looking at time?
7 MR. BRADFORD: We're pretty stressed.
8 MR. STILLS: We'll confer briefly then. We
9 won't take a break.
10 (Brief pause.)
11 MR. STILLS: I'd like to call as a witness
12 Mr. David Frydenlund.
13 DAVID FRYDENLUND,
14 called as a witness, being first duly sworn,
15 was examined and testified as follows:
16
EXAMINATION
17 BY MR. STILLS:
18 Q Good afternoon. I'm calling you for
19 cross-examination testimony, so I'll just ask you to
20 state your name for the record.
21 A David Frydenlund.
22 Q Mr. Frydenlund, can you describe your
23 position with International Uranium Corporation?
24 A Vice President and General Counsel of
25 Denison Mines (USA) Corp.

1 Q I'm sorry?
2 A Vice President and General Counsel.
3 Q Of?
4 A Denison Mines, U.S.A. Corp. We changed the
5 name from IUC to Denison Mines.
6 Q I guess I hadn't seen a lot of the license
7 materials.
8 Based on your deposition testimony, you were
9 the main person at IUC who coordinated the deal with
10 the Muskogee facility. I'm using Muskogee facility
11 because there's FMRI and Fansteel and there's some
12 bankruptcy issues. I'll just refer to them
13 generically as the Muskogee facility.
14 A I had primary responsibility for preparing
15 and submitting the license amendment application.
16 Q And my question was: You were the primary
17 person who coordinated this deal with the Muskogee
18 facility for the transfer of these materials to IUC?
19 A No. I was -- had primary responsibility for
20 preparing license amendment application. I wasn't
21 primarily involved in the commercial terms.
22 Q Are you aware of the commercial terms?
23 A Most of them, yes.
24 Q Most of them. How much is IUC receiving as
25 a disposal fee for these materials?

1 MR. ZODY: Just reserve an objection to
2 relevance. Revenue profit streams are not relevant to
3 the definitions of ore before the Board. To the
4 extent we're getting into commercial terms of the
5 facility, there might be business information that
6 should be considered in protecting in some way. The
7 question -- we haven't got any protective order in
8 place, but I do have a concern about going into
9 commercial issues in this proceeding.
10 MR. STILLS: If I may, a protective order
11 would have been the appropriate route to take if the
12 objection was legitimate. This objection was raised
13 during deposition. I informed counsel that
14 Mr. Frydenlund has been put forward as an expert
15 witness. Mr. Frydenlund as an expert witness enjoys
16 no privileges. There is no confidentiality here.
17 What Mr. Frydenlund knows and what he's been put
18 forward concerning the economic issues concerning ore,
19 leave him without -- assuming they're even was a
20 legitimate objection, which I would say that there is
21 not, there is no privilege here to maintain, and none
22 has been attempted.
23 MR. NELSON: Can I ask a question? Are you
24 making a claim of business confidentiality?
25 MR. ZODY: Yeah, I guess I am. If this

1 Board has rules on business confidentiality and
2 applies those rules, it would seem that business
3 confidentiality might be appropriate in this
4 circumstance. I personally am not familiar how this
5 Board handles commercial information and commercial
6 terms under this type of scenario.
7 MR. STILLS: We're asserting without this
8 information there's no way to know whether we're
9 involved in the processing of ore primarily for the
10 recovery of uranium or whether this might be, as has
11 been termed by the State of Utah, a sham disposal. So
12 I'm asking the question. It's relevant to the
13 argument we're making.
14 MR. BRADFORD: I think this is legitimate
15 confidential business information, and so we'll skip
16 this question. The Board has typically not asked this
17 of other regulated entities as we've had similar
18 issues come before the Board, so we'll ask you to
19 proceed with another question.
20 MR. STILLS: I will ask this. Then I will
21 pause after I ask it to make sure I don't step on the
22 ruling you just made.
23 Q (By MR. STILLS) And that is to ask, will IUC
24 receive a disposal fee for the receipt of these
25 materials? I believe this was answered in the

1 deposition so if there's any privilege, it's probably
2 been waived.
3 MR. NELSON: Are you going to assert a
4 privilege on that question?
5 MR. ZODY: No, I'm not. Whether a fee is
6 received -- it's the exact terms of the fees that are
7 for businesses that are the confidential business
8 information. The fact of a fee, I think he's already
9 testified in his deposition. So that part of it, no,
10 but the specific terms of the deal and the specific
11 commercial terms, yes.
12 MR. BRADFORD: Go ahead and please answer
13 the question. We won't ask you to get specific.
14 A Yes, we receive a processing fee in
15 connection with this material.
16 Q Do you typically report the amount of fees
17 that you receive in your reporting to the Securities
18 and Exchange Commission?
19 A No.
20 MR. STILLS: One second.
21 (Brief pause.)
22 MR. STILLS: Thank you.
23 MR. CONE: Question.
24 MR. BRADFORD: Mr. Cone?
25 MR. CONE: I just had a question for the

1 witness.
2 THE WITNESS: Sure.
3 EXAMINATION
4 BY MR. CONE:
5 Q Hopefully you can hear me. This is the
6 first representative we've had from Denison or IUC
7 who's shown up here. In doing some rudimentary math,
8 it looks like the value of the material is somewhere
9 in the realm of $30 million for the processing price
10 of uranium at 72 bucks a pound. My question was: Are
11 you paying Fansteel for the material because it's
12 valuable at all? But it almost sounds like it's the
13 other way around, you're receiving founds for taking
14 the valuable material. Which is it?
15 A We receive a processing fee, and we also
16 retain the uranium.
17 Q But you're not paying them --
18 A No.
19 Q -- to take the value of the material, the
20 ore. Right?
21 A No.
22 MR. CONE: Thank you.
23 MR. ZODY: Just one follow-up question on
24 that.
25 MR. BRADFORD: Yes.

1 EXAMINATION
2 BY MR. ZODY:
3 Q The value of uranium, though, is yours?
4 A Yes.
5 MR. ZODY: Thank you.
6 MR. BRADFORD: Mr. Stills, did you have any
7 other cross-examination that you wanted to conduct?
8 MR. STILLS: If you could give me just one
9 moment to confer.
10 (Brief pause.)
11 MR. STILLS: I think we're complete with our
12 cross-examination of IUC's -- if I may, just a
13 reminder, if the Board does have questions that those
14 folks are here.
15 MR. BRADFORD: Thank you.
16 Laura Lockhart, do you have witnesses?
17 MS. LOCKHART: I do. I would like to call
18 Loren Morton again.
19 LOREN MORTON,
20 called as a witness, being previously sworn,
21 was examined and testified as follows:
22
EXAMINATION
23 BY MS. LOCKHART:
24 Q Mr. Morton, there is testimony -- there has
25 been testimony of Loren Morton submitted as Exhibit 5

1 to the Executive Secretary's opening brief and
2 Exhibit 8 to the Executive Secretary's response brief.
3 Is that your testimony?
4 A Five, yeah, that's --
5 Q I've marked them.
6 A That's my tab number, and the response brief
7 I don't have a tab on it.
8 Q It is on there.
9 A Okay. It's there.
10 Q With that objection we'll assume it is, if
11 that's all right.
12 Were you involved in the preparation of the
13 groundwater discharge permit issued to the mill in
14 2005?
15 A Yes, ma'am.
16 Q Can you briefly describe your involvement in
17 that?
18 A I wrote it.
19 Q All right. That's pretty clear. Would you
20 please briefly describe some of the pertinent
21 requirements that you believe are particularly
22 important in that document?
23 A Groundwater permits usually break out into
24 four our five different sections: We classify
25 groundwater; we establish protection levels; we

1 establish requirements from -- we approve design
2 requirements on new facilities, on existing
3 facilities; we focus on operational procedures.
4 So there's a section in the permit that
5 deals with operations; another section monitoring,
6 reporting; and finally a section on compliance
7 requirements, how to define it, what is noncompliance.
8 And then generally most permits have a compliance
9 schedule attached to them, things that need to be
10 cleaned up and resolved. Was that your question?
11 Q That's part of my question. Did you
12 recommend to Dane Finerfrock that this license
13 amendment would not pose significant risk to human
14 health and the environment?
15 A I recommended to Dane that he approve the
16 Fansteel proposal, yes.
17 Q Was that a part of the decision-making
18 process, then, a conclusion that it would not
19 significantly impact human health or the environment?
20 A Correct.
21 Q Were there parts of the groundwater permit
22 that were particularly pertinent to that
23 recommendation?
24 A Certainly there were. The permit called out
25 a performance modeling study be done to evaluate the

1 cover design. It's an existing facility, and there's
2 millions of tons of tailings over this liner. Rules
3 came along in 1987 and the facility had already been
4 built. So where's the opportunity for improvement?
5 Well, it's in the cover system by and large. And so
6 we called out a requirement for a model to be run and
7 evaluations be made and see what kinds of design and
8 specifications could be used to improve cover system
9 performance.
10 Second, we required -- for existing
11 facilities we required discharge minimization
12 technology, and we require a plan, a DMT plan. There
13 we were asking the permittee to evaluate certain
14 aspects of their operation and look for ways to
15 improve it so we could minimize impact on local
16 groundwater quality or minimize the potential for
17 adverse impacts.
18 And both of those -- both the cover design
19 modeling and the DMT plan are parts of the compliance
20 schedule and the permit. Another area we looked at in
21 issuance of the permit had to do with improvements in
22 monitoring.
23 And we -- I think I put it here in our -- a
24 number of new monitoring wells were required. If I
25 remember right, the NRC license at one time required

1 four our five wells for compliance, and now there's
2 22. We required additional analytes as a part of
3 issuing the permit. Where the NRC called out four
4 parameters for monitoring, three of which they defined
5 terms of compliance, we now have in the permit over
6 30.
7 And we established the compliance limits in
8 the permit for each of those contaminants. And the
9 groundwater permit has definitions in it for how do we
10 determine compliance. And if we were to find
11 noncompliance in groundwater monitoring data, the
12 permit and the rules call for an investigation to be
13 conducted to the Executive Secretary's satisfaction
14 and that a compliance -- sorry, a corrective action
15 plan proposed and put into play to control and contain
16 any release.
17 MS. LOCKHART: I have no further questions.
18 I'm not sure what order you guys want to go in.
19 MR. BRADFORD: Cross-examination,
20 Mr. Stills or Mr. Zody?
21 MR. ZODY: I don't believe I have any
22 questions. I think we've covered with Mr. Morton the
23 areas I wanted to cover.
24 MR. BRADFORD: Okay.
25 EXAMINATION

1 BY MR. STILLS:
2 Q I just have a couple questions based on
3 the -- it's always fun when I look over folks
4 shoulders. I appreciate your being here. Thank you
5 for hanging in there with us.
6 Mr. Morton, you visited these tailings cells
7 1 and 3 at the IUC facility?
8 A Sure, 1, 2, 3, 4A, yeah.
9 Q But 4A is not in operation now. Is that
10 correct?
11 A It's in the process of being retrofit.
12 Q And what are the requirements for the liners
13 in 4A?
14 A Well, that's still being worked on. I'm in
15 the middle of an interrogatory process. And a
16 construction permit and the groundwater permit have
17 yet to be issued.
18 Q Is a 30-mil PVC liner being considered for
19 cell 4A?
20 A No, sir.
21 Q Why not?
22 A Technology has changed since 1979.
23 Q Concerning the PVC liners in cells 1 and 3
24 particularly, because they're the cells with the
25 liquid in them now and part of the application that we

1 are concerned here because that's what cells will be
2 used for this proposal, is any of the liner exposed
3 around the perimeter of either of those cells?
4 A I don't recall any -- observing any exposed
5 liner in either 1, 2, or 3.
6 Q So when you go to the site, there's no liner
7 going to have the impact of sunlight on it?
8 A That's my recollection.
9 Q And just so I'm clear, I'm -- whether above
10 or below the freeboard, at any point is the liner
11 exposed to the sun at this point?
12 A I don't recall seeing liner exposed in cells
13 2 or 3.
14 Q Or 1?
15 A And 1 has been -- it's been a long time
16 since I visited cell 1. At that time I don't recall
17 seeing a liner exposed.
18 Q I appreciate that. Those were some
19 questions I had. If you don't know, that's fair
20 enough. I'll go ahead and leave that question.
21 Something from one of your reports from
22 2000 -- and I read earlier from this in my examination
23 of Mr. Taylor. "It is reasonable to expect that
24 puncture damage did occur during construction;
25 resulting in a number of imperfections and

1 perforations in the PVC liner near all four IUC
2 tailings cells."
3 MS. LOCKHART: Can you give us a page
4 number?
5 MR. STILLS: I'm sorry. 0686, DRC IUC DSC
6 0686.
7 Q (By MR. STILLS) That was your observation in
8 June 27, 2000, based on your analysis of the condition
9 of the cell and the reports that you have listed here.
10 That was your conclusion. Is that correct?
11 A Well, the first paragraph on that page talks
12 about the fact I couldn't find any puncture tests that
13 were done to evaluate the PVC membrane and its ability
14 to resist static and dynamic loads during the
15 installation process. The second paragraph then goes
16 on to discuss how PVC material has a lower puncture
17 strength than the current preferred flexible membrane
18 liner which is HDPE and --
19 Q If I may, HD --
20 A High density polyethylene.
21 Q That's more than likely going to be required
22 on 4A?
23 A It's being -- yes, it will be used in the
24 construction on cell 4A, HDPE.
25 Q How long has 4A been under consideration?

1 A Well, what do you mean by consideration,
2 Counselor?
3 Q How long has -- have you been working on the
4 interrogatories concerning cell 4A?
5 A I think -- boy, that's a hard one to answer.
6 In these memos of 2000 you referred to I recommend
7 that it be retrofit. And in the permit we issued in
8 March of '05 it requires it. And in early 2006 -- I
9 haven't got the exact date, but the permittee
10 submitted a design proposal for that retrofit work.
11 And it's been under review by our Agency now since
12 that time, and it's a work in progress.
13 Q Was cell 4A considered as an alternative
14 disposal cell for use during this license application?
15 A For the Fansteel material?
16 Q Yes.
17 A From what I recall it was the -- it was --
18 no. That's the short -- because the NCR was issued in
19 November '05, and the application for the retrofit on
20 4A didn't come in until early to mid-'06.
21 Q But cell 4A has been done?
22 A It was constructed in the '80s. I'd have to
23 go back to the notes -- mid-'80s.
24 Q My basic point is: It's out there, it needs
25 to be retrofitted and brought into appliance and then

1 operation. Is that correct?
2 A Yes, it did. And we recognized that in
3 these memos of 2000.
4 Q Right.
5 A And we recognized it again in the permit
6 statement basis, December '04.
7 Q But it wasn't considered as part of the
8 safety evaluation?
9 A We did not authorize it for use in the
10 permit, and we didn't -- so therefore, when the SER
11 was written for the Fansteel material, it was not
12 considered an appropriate place for disposal.
13 Q Wasn't considered as an alternative at all
14 during that period, then?
15 A In November '05 that's true.
16 Q Okay. I'm kind of jumping around here, but
17 hopefully we'll be moving towards the end of the day
18 here. I'm still on page 686 of your report. And you
19 see where it says A?
20 A Uh-huh (affirmative).
21 Q Okay. In the section titled PVC Liner
22 Material Design Concerns and Issues?
23 A Yes, sir.
24 Q Can you read for me starting at A and read
25 the first two sentences?

1 A "High water vapor permeability and
2 unmeasured discharge to environment. Technical
3 literature indicates that a 30-mil PVC membrane
4 without defects will discharge water at a rate of
5 1.93 gallons per acre per day due to water vapor
6 transmission alone." That's from Koerner page 369,
7 table 5.2.
8 Q Do you consider Koerner to be an
9 authoritative text in that field?
10 A For flexible membrane liner technology, yes.
11 Q If you can go ahead and continue.
12 A "Unfortunately, this leakage rate is greater
13 than the EPA RCRA de-minimis leakage rate (1.0 gallons
14 per acre per day, see EPA, page 30)."
15 Q Would it be a fair characterization of what
16 was written here to say that PVC -- 30-mil PVC
17 membranes in the best of circumstances leak?
18 A All membranes leak. It's the rate at which
19 they leak. And the point I'm making here is that
20 today's technology drives us to use high density
21 polyethylene. In 1979 there was not -- there was a
22 different standard, and PVC was used on cells 1, 2,
23 and 3 and approved by the NRC. And that was a
24 different era, and today is a different time.
25 Q I appreciate that, and I appreciate your

1 patience with my questions. What you say here also is
2 that if this were a RCRA facility we would exceed the
3 de-minimis leakage rate that's allowed there?
4 A No, I didn't imply that. I said that for
5 the RCRA program there's a de-minimis leakage rate
6 established in EPA guidance dealing with water vapor
7 transmission through perfect membranes, and that's on
8 the order of one gallon per acre per day. And PVC
9 naturally allows water vapor to permeate through it at
10 a higher rate --
11 Q About how many?
12 A -- almost double --
13 Q I'm sorry. I cut you off.
14 A Almost double the rate.
15 Q How many acres is cell 1?
16 A Oh, over 100. I'd have to get out the
17 figures. Some of these ponds are in excess of
18 200 acres, but I don't recall exactly.
19 Q So based on perfect liners, that perfect
20 world that doesn't usually exist, doesn't appear to
21 exist here, you would multiply the number of acres by
22 that leakage rate and determine approximately how much
23 is leaking if it was performing perfectly?
24 A That would be an estimate.
25 Q An estimate. And that estimate would come

1 out about 400 gallons per day from pond one if we
2 assume it's 200 acres?
3 A Well, it's very simplistic. The exact flow
4 rate would be a function of -- in this case it's water
5 vapor so we're talking about fixed law concentration
6 gradient and a number of things that come into that
7 calculation.
8 MR. STILLS: No, I appreciate that, and I
9 appreciate your forthcomingness in the difficulty of
10 some of these issues. I appreciate the time. Let me
11 check with co-counsel one moment.
12 (Brief pause.)
13 MR. STILLS: Thank you, Mr. Morgan. I
14 appreciate your time here today.
15 MR. ZODY: Just a couple of quick questions.
16 EXAMINATION
17 BY MR. ZODY:
18 Q Mr. Morton, these issues that were discussed
19 in your memorandum from the year 2000, those were
20 being discussed as you were considering issuing the
21 groundwater permit. It was part of the process for
22 considering issuing a groundwater permit for the site.
23 Correct?
24 A It was part of the process, yes.
25 Q And in fact a groundwater permit was issued

1 by DRC March 5, 2005, following the DMT rules under
2 groundwater rules. Correct?
3 A Correct.
4 Q And the DMT rules say that when you have a
5 facility that was built in this time frame, it doesn't
6 have to meet current best available technology.
7 Correct?
8 A That's correct. Best available technology
9 is reserved for brand new facilities.
10 MR. ZODY: Thank you.
11 EXAMINATION
12 BY DR. NELSON:
13 Q One very quick question, Loren. You've been
14 discussing vapor phase transport across a PVC
15 membrane. Would there be any transport of solutes
16 across that membrane?
17 A Fick's Law would suggest that could happen
18 too.
19 EXAMINATION
20 BY MR. BRADFORD:
21 Q Loren, question on pond No. 4. The reason
22 that that pond is being rebuilt, reconstructed,
23 whatever the right word is there, to the newer
24 technology, higher standard -- what is the reason for
25 that being done to that pond and not the other ponds?

1 A I can answer that question on two points.
2 One, after its construction in the mid-'80s, about '85
3 to '87, somewhere in there, it was only used to store
4 vanadium rathnate, which means after the uranium
5 recovery process there was still vanadium in those
6 fluids that could be recovered. And the company
7 stored those fluids in cell 4A waiting for recovery of
8 that metal at some other -- a later date. So moving
9 fluids out of that cell was much, much easier to do
10 than mucking out millions of tons of solids.
11 Second, during my first inspection at the
12 site -- or visit back in -- oh, somewhere in '94 to
13 '96 time frame, I noticed that the FML panels on the
14 inside side slopes had blown out over about a quarter
15 of the inslope. Part of that is due to wind lifting.
16 There's nothing ballasting that membrane for years,
17 and the wind blew them out. So there's some massive
18 repair that was needed.
19 And third, the leak detection system that
20 was constructed underneath the cell 4A was -- although
21 it was an improvement over cells 1, 2, and 3, it was
22 still extremely inefficient in that it only gathered
23 fluids over a couple percent of the floor.
24 And fourth, the NRC -- the company reported
25 leakage flows in that detection system, and the NRC

1 allowed them to operate it in that leaky state for a
2 number of years. And I don't recall off the top of my
3 head exactly how many, but I think it was in the
4 neighborhood of eight.
5 Q Was it the company's decision, then, to
6 reconstruct this pond because they wanted to use it,
7 or was this a requirement that was put on them by your
8 regulatory process?
9 A As I recall, in negotiating the permit we
10 made it clear what we wanted, and I recall they agreed
11 to it. Who initiated the proposal, I don't remember.
12 But as the record shows, back in 2000 I was
13 recommending to my superiors that retrofit was
14 necessary.
15 MR. BRADFORD: Thank you.
16 Further questions?
17 MS. LOCKHART: Thank you, Loren.
18 I don't have any direct examination for
19 Mr. Finerfrock, but -- oh, I'm sorry. That's all I'm
20 going to say.
21 MR. BRADFORD: You have no more witnesses.
22 MS. LOCKHART: I don't have any direct
23 examination for Mr. Finerfrock, but I'm making him
24 available for cross-examination and for the Board.
25 MR. BRADFORD: Any cross-examination for

Mr. Finerfrock?

MR. STILLS: I may just a moment, please.

(Brief pause.)

MR. STILLS: No, we don't have any questions for Mr. Finerfrock at this time.

MS. LOCKHART: I have no more witnesses.

MR. ZODY: Let me confer for a second.

MR. BRADFORD: Okay. Times up.

(Brief pause.)

MR. ZODY: Mr. Finerfrock, just a few questions.

DANE FINERFROCK,

called as a witness, being first duly sworn,

was examined and testified as follows:

EXAMINATION

BY MR. ZODY:

Q Good afternoon, Mr. Finerfrock. Can you explain for the Board the difference between the radioactive materials license and the groundwater permit and the difference between the rules, from your understanding?

A The radioactive materials license and the groundwater discharge are inseparable. Several years ago it was recognized that some of the licensees that

1 we do regulate, for instance, this facility and
2 others -- a groundwater discharge permit was necessary
3 under the State rules. It was decided that in order
4 to make one-stop shopping available to the
5 licensees -- we had developed the expertise within the
6 Division of Radiation Control, although the permitting
7 program is in the Division of Water Quality, and the
8 Water Quality Board is similar to the Radiation
9 Control Board.
10 In order to make it simpler for these
11 licensing or permitting efforts to occur, I was named
12 Co-Executive Secretary of the Water Quality Board for
13 the purpose of issuing these permits for a certain
14 number of licensees that we would hold in common.
15 In general, for these facilities, these
16 types of facilities, the radioactive materials license
17 deals with the radiation safety, health and safety
18 issues, issues of surety to some degree, and they also
19 have provisions which point to the groundwater
20 discharge permit. Likewise the groundwater discharge
21 permits that we issue in general point to the
22 radioactive materials license as well.
23 Q Thank you. The groundwater discharge permit
24 that was issued in March of 2005, it permits the
25 tailing cells to operate under the State DMT rules?

1 A Yes, it does.
2 Q And if anyone were to directly appeal or
3 challenge that permit, where would that appeal go?
4 A To the Division of Water Quality Board.
5 Q And that Board is the one that regularly
6 handles the groundwater permit issues?
7 A That's correct.
8 Q Now, at the time the Fansteel amendment was
9 approved -- and the SER cites a statement of basis for
10 the groundwater permit and groundwater discharge
11 permit. The groundwater discharge permit was in
12 place, and there was things that would be done under
13 that permit including this background study. Correct?
14 A Correct.
15 Q And yet you went ahead and issued -- in your
16 opinion felt it was appropriate to issue the Fansteel
17 license amendment. Correct?
18 A Yes.
19 Q Can you explain to the Board your reasoning
20 for that?
21 A There are several reasons why I felt it was
22 appropriate to go ahead and approve the license
23 amendment. Based on my review of the materials that
24 my staff prepared and some of the materials that were
25 provided by IUC in their application, the Fansteel

1 material met the criteria set forth in the alternate
2 feed guidance.
3 Secondarily, I take a recommendation from
4 Mr. Morton and his staff very seriously. They are
5 experienced, they're thorough, and if they felt this
6 was appropriate, there's no reason for me to doubt it.
7 I think those are the two reasons that I
8 think of most commonly.
9 Q It's your opinion that Fansteel material can
10 be safely processed with no significant risk or harm
11 to the public?
12 A Yes, sir.
13 MR. ZODY: Thank you.
14 EXAMINATION
15 BY DR. NIELSON:
16 Q Mr. Finerfrock, I appreciate the
17 clarification in terms of the license and the
18 groundwater permit, but I wanted to ask a follow-up
19 question on that. In the license amendment that you
20 received for the Fansteel material, there's a section
21 in there on groundwater, and it's on page 15 of the
22 application. I apologize. I just lost it on my
23 document here. I think it's Section 4.6.
24 MS. LOCKHART: Do you have a page number?
25 DR. NIELSON: I can give you document

1 number. I'm sorry. DRC IUC 0245 is the page number,
2 yes. And the document itself is DRC IU -- well, I
3 don't know what it is. I'm sorry. It was in the
4 administrative record. It was not an e-mail. It's
5 pages out of a spiral bound.
6 Q (By DR. NIELSON) This Section 4.6 is
7 groundwater. And in the first paragraph the statement
8 is made by IUC that because the mill's tailing cells
9 are not impacting groundwater the receiving process of
10 the uranium material at the mill will not have an
11 incremental impact on groundwater over and above
12 existing licensing operations. That was a direct
13 quote from the last sentence of that paragraph.
14 Do you -- if a tailings pond was leaking, do
15 you believe that that statement would be accurate? If
16 a tailings pond that the license or proposed license
17 material was going to be placed in was leaking, would
18 that be an accurate statement?
19 A The statement by the NRC staff here is
20 quoted as not being -- that the groundwater beneath
21 the mill site will not be adversely impacted.
22 MS. LOCKHART: This is IUC.
23 A Yes, this is the IUC application.
24 Q Right.
25 A And they're quoting something --

1 Q Well, I think the first sentence they quote
2 NRC where they say in the 1997 EA that NRC found out,
3 but that was a while ago. Then they go on to -- the
4 second sentence I think applies to now. And it says
5 because the mill's tailing cells are not impacting
6 groundwater based on the '97 finding, I'm assuming,
7 that the receipt and processing of this proposed
8 license material, Fansteel material, would not have an
9 incremental impact on groundwater.
10 My question is: If the tailing cell that
11 this waste was to be placed in after it was processed
12 was leaking, would that be an accurate statement?
13 A No, I don't think it would be an accurate
14 statement.
15 Q Would you be able to approve a license
16 amendment if the tailing cell was leaking?
17 A If a tailing cell had been determined to be
18 leaking and my staff came to me and said we can
19 through permit changes and the application of
20 technology correct that leak, you're asking me to
21 speculate now. I believe we could still go ahead with
22 an authorization to accept this material, but there's
23 a lot of unknowns in what I just said.
24 Q But the representation that was being made
25 here was that it was not leaking. Is that a -- am I

1 reading that correctly? Am I understanding that
2 correctly?
3 A I don't read this to say that they're not
4 claiming it's leaking. They're saying it's not
5 adversely impacting, and will not adversely impact
6 continuing operations of the mill.
7 Q What's the difference between leaking and
8 adversely impacting? I'm sorry. It sounds like this
9 is NRC jargon.
10 A It is NRC jargon. What's the difference?
11 Again I think that's a question better asked of
12 somebody who is a hydrologist. But it might be
13 possible that water can leak that would not adversely
14 impact operations at the mill, that would not
15 adversely impact the water below the mill. I'm really
16 unprepared, not in a position that should answer that
17 question.
18 DR. NIELSON: I appreciate that. Thank you.
19 MR. BRADFORD: Any questions for
20 Mr. Finerfrock?
21 MR. ZODY: Just a few follow-ups on
22 Dr. Nielson's questions.
23 EXAMINATION
24 BY MR. ZODY:
25 Q Part of the groundwater permit and program

1 is the monitoring of the groundwater. Correct?
2 A Correct.
3 Q And for any facility, tailing facility, you
4 also rely upon the monitoring of the groundwater as
5 part of whole program?
6 A Yes, sir.
7 Q And in this statement do they also say -- I
8 take that one back. At the time you issued the
9 license amendment, you were relying upon the
10 groundwater permit and all of its protections. Is
11 that correct?
12 A Yes.
13 MR. ZODY: Thank you.
14 EXAMINATION
15 BY DR. NELSON:
16 Q Dane, I'm going to ask a hypothetical, and
17 we'll see if you feel comfortable answering it.
18 Let's imagine that there was a leak of some
19 size. We don't know what it is. Would 32,000 tons of
20 material from Oklahoma added to the impoundment versus
21 an equivalent amount of Colorado plateau ore being
22 placed in the impoundment make a substantive
23 difference on what was coming out of the leak?
24 My question is: Does it matter if it's
25 Fansteel or not or something else if there were a

1 leak?
2 A Based on the knowledge that I have, I don't
3 believe it would matter that it's Fansteel.
4 DR. NELSON: Thank you.
5 MR. BRADFORD: Okay. We have reached a late
6 hour in the day. I don't suppose this will come as a
7 surprise to anyone. I don't think we're going to be
8 able to reach a decision here today.
9 What I would like to do is let's take a
10 quick break. We'll reconvene at 4:00 o'clock. We'll
11 ask the two parties to give their closing arguments
12 beginning with Sierra Club, and --
13 MR. STILLS: I have one quick witness to
14 bring up on redirect. I believe we still have some
15 time reserved for rebuttal witnesses.
16 MR. BRADFORD: You're right.
17 MR. STILLS: I appreciate -- I want to get
18 you to your deliberations as soon as we can. I
19 promise we will be quick. I appreciate the time.
20 MR. BRADFORD: Okay. Just for the Board's
21 information, my intent is that we do this, we'll have
22 the closing statements, and that's where we'll
23 conclude the day, and we'll have to pick it up at our
24 meeting next Friday for deliberation.
25 MR. NELSON: It's 15 minutes for closing, so

1 we've still got another hour.
2 DR. NIELSON: We've got till 5:30.
3 MR. BRADFORD: I thought you needed to be
4 back to the airport by 5:30.
5 Take a break till 4:00 o'clock.
6 (A recess was taken from 3:49 to 3:58)
7 MR. BRADFORD: Mr. Stills, you have a
8 witness that you want to recall?
9 MR. STILLS: Yes, if I may. I'd like to
10 recall Mr. Robinson. And just to refresh your memory,
11 his expertise is 30 years work in uranium, uranium
12 mills and extensive experience. I would like to ask
13 him two quick lines of questioning, and I'll honor my
14 word to you that it will be quick.
15 MR. BRADFORD: Go ahead.
16 PAUL ROBINSON,
17 called as a witness, being previously sworn,
18 was examined and testified as follows:
19

EXAMINATION

20 BY MR. STILLS:
21 Q Mr. Robinson, when you were listening to the
22 testimony today, did you hear a concern raised about
23 the mineral form of the uranium?
24 A Yes, I did.
25 Q In your review of the record that was put

1 forward here, did you identify a concern about the
2 mineral form of the uranium?
3 A Did I identify a concern in my statement?
4 Q A concern of you -- in your review.
5 A Yes.
6 Q Did you look for information in the
7 administrative record concerning the mineral form of
8 the uranium?
9 A Yes.
10 Q Did you find any?
11 A No.
12 Q And did you hear testimony here today that
13 confirms that there is none?
14 A Yes, I did.
15 Q In your opinion, is the mineral form in
16 which uranium or other materials are contained in a
17 material -- is that necessary information to determine
18 whether that metal would be recoverable?
19 A It's necessary. It doesn't answer the whole
20 question, but it's critical to that.
21 Q Without that information you don't have
22 complete information on whether -- on recoverability
23 which is the second point you make in your three
24 points on determining what is ore?
25 A Without that information you don't have any

1 idea of what state the uranium is found in. But you
2 would need more than just the nature of uranium
3 compounds and valance state to answer recoverability
4 questions.
5 Q Okay. Move on to the second line of
6 questions. Were you here -- did you hear testimony
7 concerning the Jeffrey City mill Mr. Taylor discussed
8 today?
9 A Yes, I did.
10 Q Are you familiar with the history of that
11 mill?
12 A Yes, I am.
13 Q Was there ever a groundwater contamination
14 problem found at the Jeffrey City mill which
15 Mr. Taylor was describing?
16 A Yes.
17 Q Could you describe, briefly again because of
18 the time of day, a little bit about the history of
19 that groundwater contamination at the Jeffrey City
20 mill?
21 A The Jeffrey City mill closed in 1981. The
22 surface decommissioning was completed in 1988. By
23 1995 the DOE summary of decommissioning at uranium
24 production facilities identified a groundwater
25 restoration cost of $13 million. There is currently a

1 proceeding before the NRC in which the Jeffrey City
2 mill operator, Western Nuclear, is seeking to have
3 alternative concentration limits for its groundwater
4 restoration requirements, meaning the existing
5 standards cannot be met, and the company is seeking to
6 have the numerical standards raised. This is parallel
7 to the proceeding for the SOHIO mill that I testified
8 about previously.
9 Between 1990 and 2006 Jeffrey City mill
10 operator has pumped more than 400 million gallons of
11 contaminated water. The projected cost of continued
12 remediation is in the 20 to $100 million range and may
13 not be able to be completely successful at that cost.
14 The alternative concentration limit proposal
15 includes withdrawing more than 3000 acres of land from
16 groundwater use and providing alternative water
17 supplies to the domestic water users in that area.
18 And the plume is projected to reach one to two miles
19 beyond the southwest edge of the tailings facility.
20 MR. STILLS: Thank you.
21 EXAMINATION
22 BY MR. ZODY:
23 Q Mr. Robinson, I'll make it quick as well.
24 The Jeffrey City site -- you say there was a plume of
25 contamination at that site?

1 A There is a plume, yes.
2 Q What were the uranium levels in that plume,
3 if you know?
4 A The plume -- uranium levels reached over one
5 milligram per liter up to 10 milligrams per liter at
6 the upstream end. The toe is certainly lower, but the
7 core is well over one part per million.
8 Q And you would agree on the record here today
9 there's been no evidence of a plume of uranium
10 contamination at this mill, the White Mesa Mill?
11 A There's been no evidence of a plume in part
12 because I haven't reviewed the document that would
13 reflect any sort of a plume. So I don't know if
14 there's evidence regarding that in the background
15 document, so I'm not aware of the plume.
16 Q You're aware the background document
17 concludes there is no contamination coming from on
18 site from the constituents coming from the background?
19 A I haven't seen a document, so I'm not aware
20 of any part of it.
21 MR. ZODY: Thank you.
22 EXAMINATION
23 BY MS. GORYUNOVA:
24 Q The problem with the groundwater site, was
25 it discovered in operation or was it discovered

1 suddenly after the mill was closed?
2 A I believe that the plume was identified
3 after operation.
4 MR. BRADFORD: No other questions?
5 Thank you.
6 We are going to move then into the closing
7 arguments. Sierra Club representatives will go first.
8 There's 15 minutes a piece. I would ask if you're
9 going to use visuals that you use them over to the
10 side so that the Board, as well as the members of the
11 audience, can see them.
12 MS. LOCKHART: Can you give us one moment to
13 confer since we have to share time?
14 MR. BRADFORD: Yes.
15 (Brief pause.)
16 MR. STILLS: I will be brief. I would like
17 to reserve five minutes for rebuttal time. And also
18 as a preliminary matter, I think we're hoping to get
19 done here today so you can deliberate and reach a
20 decision. If not and you need to roll it to next
21 Friday, I just want to clarify, I've spoken with
22 counsel and they've agreed there will not be any
23 processing at the mill if the proceeding runs over
24 until next Friday concerning these materials.
25 The other thing is I just want to clarify,

1 if it does roll over till next Friday, we just need to
2 have counsel present and not witnesses at next week's
3 hearing?
4 MR. BRADFORD: We'll discuss that when we
5 come to it.
6 MR. STILLS: Okay. Thank you. I apologize
7 for jumping over --
8 MR. NELSON: Once closing argument is done,
9 the process is no further evidence will be received.
10 I guess if the Board wants to call back witnesses
11 after reviewing materials, they could. But from the
12 past practices the only thing that would happen next
13 Friday would be deliberation of the Board.
14 MR. STILLS: Thank you. I appreciate that
15 clarification so I can let folks know and take care of
16 the logistics.
17 Again, I'll move quickly so maybe we'll be
18 able to get to the deliberations and a decision.
19 Again, as you have heard this morning and
20 throughout the day the case that was brought here
21 concerns an outdated and outmoded uranium mill with
22 cells designed with 1970's technology that if used at
23 all should be retrofitted with an alternative pond 4A.
24 It's been under consideration for quite some time, in
25 need of retrofitting. The alternatives here, if this

1 were together forward, were not considered while the
2 DRC and Executive Secretary were deliberating.
3 The outmoded nature of the disposal cells --
4 just take a minute and understand the argument that's
5 being moved around here. It's okay in 2007 that
6 they're leaking because they were built in 1979.
7 We're talking about -- we're not talking about an
8 outhouse too close to a lot line, which is how
9 variances typically come into play.
10 We're talking about some very, very serious
11 issues of uranium meltdowns, issues which have plagued
12 the West since the early '50s. And as members of this
13 Board I appreciate that you are quite cognisant and
14 take judicial notice -- take notice of what's
15 happening in Monticello, what's happening with
16 radiation exposure around the West, and what happens
17 when agencies who are in charge of regulation just
18 kind of let it slide and call it good enough.
19 I'm not implying that the DRC is doing that.
20 I think the folks at the DRC are doing a very good
21 job, that they have today. I have to commend Loren
22 Morton in his work. It's to stick one's neck out to
23 put it in a report that there is a problem. I
24 appreciate the events. Don't mistake that I was
25 criticizing there.

1 I was criticizing more generally with the
2 history of the uranium program. It's plagued with the
3 failure to notify miners of near exposure to
4 radiation. That's been a checker of your past. We're
5 still dealing with that.
6 And what we are asking as part of this
7 amendment is for the Board to look at the current
8 conditions, look at the current conditions which are
9 not a lack of leakage, are not a lack of monitoring
10 data that shows uranium, selenium in monitoring wells
11 at the site.
12 There's been an identified problem. Staff
13 has known about it, and it appears staff has been
14 working on it fairly hard. For those of us who review
15 Safety Evaluation Reports and base our decisions on
16 those -- base our understanding of decisions and base
17 decisions on those analyses that are presented to us,
18 for members of the public, there's no way to fully
19 comprehend what's going on out here by looking at the
20 Safety Evaluation Report.
21 That was a necessary step. That's built
22 into the regulatory system. It was recognized by
23 Congress that the states even when they do get the
24 safety program need to do thorough analysis of the
25 environmental impacts when they go forward due to the

1 seriousness of the materials that we're dealing with.
2 Numerous questions were brought up by this
3 Board. I have to say I was quite impressed about the
4 level of knowledge of this Board. I have not appeared
5 other than the last time before this Board when we
6 discussed standard, and I've appeared before numerous
7 Boards. Not all Boards are comprised with the level
8 of expertise you have, and I appreciate the questions
9 you've asked today.
10 When you look at this outmoded mill, when
11 you look at cells 1 and 3 and look at their condition,
12 you look at 4A which has been sitting there for years,
13 ask yourself what's going on out here at this mill.
14 Cell 3 is almost at capacity. Is this mill being
15 operated in a way that you would expect a uranium mill
16 to operate? Is it being operated in a way that you
17 would expect a disposal facility trying to get a few
18 more bucks and avoid a remediation fate is operating?
19 Think about that when you look at that.
20 What is going on in this mill? Taking the
21 evidence that we have out here, we've got someone
22 being paid to take something that's supposedly
23 valuable. We have no information to make any
24 judgments on that.
25 The data collected and presented by

1 International Uranium Corporation in reliance on
2 Ms. Tischler was described and discussed here as
3 problematic at best, close estimates maybe. When
4 faced with problems in a formal administrative
5 hearing, she went back and did a lot of work, work
6 that should have been done up-front ahead of the time
7 it was presented for staff review and ahead of the
8 time it was presented for public review.
9 As you've heard, the Safety Evaluation
10 Report is important because there is a requirement
11 that these things be -- these matters be exposed to
12 the public before a decision is made by the Board.
13 Concerning approval, I think there are other decisions
14 that the Board could make -- disapproval, recision,
15 remanding -- that we'll ask the Board to do that it
16 could do today to rescind this and send it back to the
17 DRC for further study and for revelation to the public
18 of things that have been raised.
19 Three points -- and again we heard from
20 Mr. Weber this morning about liners and the problems
21 with the liners. Although his view of this was
22 questioned very vigorously, I believe you'll hear that
23 his view was supported from the testimony of others
24 throughout the day as quite legitimately based.
25 Mr. Robinson and his experience with uranium

1 mills laid forward some ways you can make sure sham
2 processing is not going on here, ways that you can
3 make sure that the materials that are coming into this
4 mill fits with the Utah's laws that provide you your
5 authority and limit the authority you have as we laid
6 out our briefs. You don't have any more, any less
7 authority than that -- than we find there.
8 The serious problems as my co-counsel
9 Mr. Bartlett brought up. The disposal cells and
10 groundwater concerns have been known by DRC staff
11 since at least 2000. These ongoing problems were not
12 disclosed or discussed or evaluated in the Safety
13 Evaluation Report of which the issuance of the license
14 amendment was based. Specifically, as Mr. Bartlett
15 said, they were reopened.
16 The Safety Evaluation Report failed to
17 analyze and address the current condition of IUC's
18 cell 1 and 3, failed to reveal, analyze, and address
19 current groundwater problems and exceedances and
20 applicable groundwater standards, and failed to
21 determine whether the IUC mill is primarily receiving
22 the Oklahoma waste materials not for the profitable
23 processing of uranium but instead for the profitable
24 disposal of the waste materials.
25 One last thing, you don't hear lawyers not

1 rely on law very much, but this is mostly evidentiary
2 and presented on the briefs, so I feel compelled to
3 read a little bit of law before I close here, and then
4 I will close.
5 As I read before, here in the minimum the
6 SER must include the following analysis, two of the
7 explicit directions under Utah Administrative Code
8 R13-24-3, meeting. Assessment of any impact on
9 waterways and groundwater resulting from the
10 activities conducted pursuant to the license or
11 amendment; consideration of alternatives including
12 alternative sites and engineering methods to the
13 activities to be conducted pursuant to the license or
14 amendment.
15 Groundwater problems could not be found if
16 you looked in the Safety Evaluation Report. They
17 couldn't be understood as far as what happened after
18 2005. And alternatives concerning retrofitting and
19 putting 4A into production before any water goes
20 forward were not considered in the Safety Evaluation
21 Report.
22 Again, I believe we've laid out other
23 options that the Board has, other decisions and
24 rulings that you could make. And I would urge you to
25 throw your support in the direction of staff and let

1 them go back and give a serious disclosure of what is
2 going on down at the mill you can see just south of
3 town here. I appreciate your time. Thank you.
4 MR. ZODY: I would also like to thank the
5 Board for its time today, and I completely agree with
6 Mr. Stills in appreciating the Board's questions.
7 They've been on point and I think really added to the
8 record and made for a very robust decision that Utah
9 can be proud of however this Board decides. The Board
10 has done a very good job today.
11 I think one of the key things I want to come
12 back to is that -- and I said this in my opening
13 statement, and I believe it to be true. There's no
14 evidence that anyone has ever been harmed by any
15 activity from the White Mesa Mill for 27 years, 27
16 years of activity there. No evidence of exposure of
17 employees to high levels of uranium, no levels of
18 exposure to any person walking around the perimeter,
19 no evidence of any person drinking water that's
20 contaminated with uranium or anything else. That's
21 the fact. We don't have the exposure here of any sort
22 to anyone at this facility. Measured in that way,
23 it's a very safe facility.
24 We had very competent witnesses with
25 detailed knowledge of the mill -- with chemistry

1 experience, Ph.D. in physics, engineers -- get up and
2 explain how this mill operates. They weren't making
3 it up. This mill takes its commitment to safety very
4 seriously. They analyze all these materials, the
5 alternate feed materials included, and make sure
6 they're protecting their employees and they're
7 protecting the public. And the facts are, that's
8 what's happening.
9 This mill has been operating and doing a
10 good job for many years. It was built many, many
11 years ago, as were a lot of facilities in this state.
12 When it comes to groundwater, there's a set
13 of rules that regulate that, and they say you don't
14 have to have current best available technology when
15 you get your groundwater permit. This facility went
16 through a very detailed groundwater permitting
17 process. And you know what that process was focused
18 on? Just about everything we've discussed here today,
19 just about everything that has been brought before
20 this Agency.
21 Of course, we discussed it because that is
22 what is being alleged against the mill. We have to
23 put out our side of the story. I apologize that
24 report came in late, but that's when it was submitted.
25 I couldn't submit it any sooner, and we feel like it's

1 fair to have the full story.
2 The mill strongly believes these tailings
3 cells are not leaking. You have, and this Agency has,
4 a very credible report from a very qualified scientist
5 that has put that in front of this Board and in front
6 of the Agency and in front of the public, and the mill
7 believes it.
8 Furthermore, as Dr. Chambers indicated,
9 that's just common sense. No one -- there's no
10 evidence of any exposure to anyone to any of this
11 groundwater beneath these cells, none. There is no
12 pathway. There's been no evidence here that there's
13 anything in the groundwater that is of a level that's
14 going to travel somewhere that someone is going to be
15 exposed, they're going to ingest it, and they're going
16 to be harmed, no person, plant, or animal. There's
17 been no evidence that a person, plant, or animal will
18 be harmed in any way by the mill.
19 Now let's talk about the Fansteel materials.
20 That's what we should be focused on. We wanted to
21 focus on that in front of this Board, but we were
22 forced to defend the groundwater permit. We had no
23 choice. We could not stand by and let these things be
24 said without bringing this material to your attention.
25 As to the Fansteel material, what do we

1 know? It's been carefully analyzed. When it gets
2 processed -- and it will, and ore will be recovered.
3 Harold Roberts' affidavit is before you. We can't
4 call all the witnesses. We want to have some
5 deliberation here today.
6 And he's familiar with the mill. He worked
7 for years and years and years. He's processed under
8 alternate feeds. They're going to make yellowcake.
9 They've got drums of yellowcake out there now,
10 yellowcake from prior alternate feeds. It's a
11 positive economic activity. It's a good thing. We're
12 recovering a resource. There's no evidence anyone has
13 ever been harmed by that.
14 So the Fansteel materials. They're going to
15 come into the mill. They're going to get milled. And
16 what's going to come out? What we've heard, the
17 undisputed testimony is it's going to be essentially
18 uranium mill tailings. And where are those materials
19 going? To a uranium mill tailings disposal cell that
20 is fully licensed and legal under the State of Utah
21 rules.
22 Okay. Now, there is a study going on of the
23 water under the cells in the shallow groundwater. But
24 Dr. Nelson asked the exact right questions. He
25 focused in on the exact right question. Let's project

1 ourselves a year from now and we continue looking at
2 this background study issue. And let's project
3 ourselves a year from now and assume the Fansteel
4 materials are not processed.
5 Now let's assume they are processed. What
6 the evidence shows is there's not going to be a
7 difference. There is not going to be a single
8 difference in what's going to happen. And that's why
9 the license amendment rules say what are going to be
10 the impacts from this material. That's what we're
11 supposed to focus on.
12 That's why the DRC granted the license
13 amendment. They know there's no evidence. They
14 studied it carefully. There is going to be no impact
15 from this material to a person, plant, or animal, to
16 the health or safety of any workers, or to this
17 community. So they made the right decision based on
18 competent evidence. They knew about the groundwater
19 permit and the statement of basis. They cite it in
20 their Safety Evaluation Report.
21 But they didn't stop there. They said let's
22 look at this Fansteel material, see what's in it.
23 Should we added something else to the groundwater
24 permit? They had a dialogue with my client, and they
25 ended up adding additional parameters. They focused

1 extensively on groundwater in this proceeding. They
2 already knew and the public knew. The Sierra Club
3 commented on it -- the groundwater permit proceeding
4 and the statement of basis.
5 That's a 52-page document. And you know
6 what it does? It discusses everything we've just
7 discussed here today. And it says these tailing cells
8 are legal. The permit was issued. That permit was
9 not challenged within 30 days.
10 I know it may not be a position this Board
11 likes to hear, but this Board does not have
12 jurisdiction over that permit. If someone wanted to
13 challenge that permit, the time has come and gone for
14 that.
15 But more important, as Dr. Nelson so
16 appropriately focused in on, when it comes to the
17 groundwater, this material is not going to change
18 anything that's happening.
19 This cell has been there for 27 years. It's
20 got 1.8 million tons -- or pounds of tailings. This
21 is a -- I don't want to downplay it, but we're talking
22 about a very minor amount of material. These cells
23 are continuing to receive material today. They're
24 licensed to do so.
25 There has been no evidence before this Board

that the Fansteel materials are going to harm anyone. The mill is safe and believes its shown that it's complied with the rules. It does focus on new impacts and incremental impacts because it knows it's got all these other programs in place.

I thank you for your time today and look forward to your deliberations.

MS. LOCKHART: Well, I'm going to talk about groundwater, too, but not for as long, I hope. I hope that you have gotten a picture of what's going on with groundwater at the mill. We've got a detailed road map, and we've got aggressive requirements, and frankly we've also got aggressive requirers.

Loren Morton is going to be -- is the kind of guy that you can count on to follow these things closely. It's not okay if these tailings are leaking. I assure you that if there's evidence of that, we will be taking action on that.

A lot of arguments that Sierra Club is making do apply, I believe, equally to the use of this tailings impoundment No. 3 for regular conventional uranium ore tailings. And when I'm faced with a situation like that, I always go back and think of what would we do if we did have this kind of information. Do we have enough information to

1 actually suspend this license, to terminate the
2 license?
3 The Executive Secretary feels like we're a
4 long way from that. We're going down a road with the
5 groundwater. We've got many, many, many steps before
6 we would take such a significant action.
7 There's been lots of discussion of the
8 definition of ore. Most of it has hooked to the
9 definition of by-product, but it's worth noting again
10 that there's nothing in the law that says only
11 by-product can be placed into the tailings ponds.
12 That's something we all have an interest in because
13 only by-product will be taken by DEO at closure of a
14 facility.
15 And so based on public comment and on the
16 recognition of that hole in the law, we did add a
17 requirement that only by-product may be placed in the
18 tailings ponds. At the same time we did that we
19 coupled it with the guidance -- the NRC guidance that
20 you've heard so much about.
21 I'd like to turn to that guidance, and
22 actually more specifically I'd like to turn to the
23 Ashland-2 case that's in my tab 1 that details what --
24 that preceded that guidance. This is a case that the
25 State of Utah lost, so this is not an easy argument in

1 some ways to make. But I think there's an easy -- I'm
2 sorry.
3 There's an excellent explanation that the
4 presiding officer made. And that is that the adverb
5 primarily in the definition of by-product applies to
6 what is removed from a material by process and not the
7 motivation for undertaking the process. That was the
8 conclusion in Ashland-2. That resulted in the
9 guidance that we agreed to follow as part of the state
10 agreement process.
11 I've said in the briefs that have been
12 submitted by the Executive Secretary that this Board
13 does have authority to change that. That's a place
14 where we differ with IUC. But I would like to urge if
15 that's going to happen, rulemaking is the best way to
16 approach that because it's a hard question.
17 What standards do you apply? Are there
18 preemptive issues? Those things deserve the long
19 consideration when it comes to rulemaking.
20 Finally, I'd like to note where the NRC
21 itself adopted the presiding officer's determination,
22 it noted that making purely economic considerations a
23 determinative part of the staff's review would
24 unnecessarily defer Agency resources unrelated to
25 public health and safety. That's what the DRC does,

1 issues related to public health and safety. If they
2 are required to go into issues of economics, they need
3 standards and they may need resources to deal with
4 those issues.
5 So that's not why we followed the guidance.
6 We followed the guidance because we agreed to do that
7 in the course of the state agreement process. But
8 those are issues that would have to be dealt with if
9 we concluded that it was not something -- or that we
10 wanted to consider another policy. That's all.
11 MR. STILLS: Be very brief. Just to
12 clarify, one of the arguments that we made concerning
13 determination under ore today was there's no competent
14 evidence for that determination to have been made, so
15 I think we provided a basis for this Board to
16 invalidate the license amendment that's before it, and
17 I look forward to your deliberations on how you may
18 handle that question today or in the future as far as
19 the definition.
20 You've heard a lot about groundwater and
21 you've heard a lot that wasn't raised in the briefs.
22 On page 8 of our closing brief, direct you to that, we
23 spent a lot of time on groundwater again. I'll quote
24 from our brief. There are several exposure -- I'll go
25 ahead and quote. "Both the Executive Secretary and

1 IUC acknowledge the following facts: Exposure
2 pathways are a concern at the IUC mill. Air, radon
3 and direct radiation, groundwater, surface water,
4 vegetation, soil, human health, worker safety, and
5 wildlife cited in the briefs.
6 Several of these impacts, exposure pathways,
7 have no analysis whatsoever in the Safety Evaluation
8 Report. They are emissions as radon and direct
9 radiation, vegetation, soil, human health, worker
10 safety, wildlife. Analysis as provided for the
11 following is cursory at best and fails to provide the
12 public with the clear picture of the problems which
13 may be addressed with groundwater and surface water."
14 Again, I appreciate your attention today.
15 As you-all determined in September, this is a matter
16 of great public importance. It's a great -- matter of
17 great public importance for this Board. It's a matter
18 of great public importance for the Sierra Club -- Glen
19 Canyon Group of the Sierra Club, their members -- Sara
20 Fields spent a significant amount of time working on
21 this issue. To the residents of the area, it's a
22 matter of great public importance.
23 We'll rest and look forward to your
24 deliberations and your decision. Again thank you very
25 much.

1 MR. BRADFORD: Thank you.
2 Okay. We're done. That brings us to our
3 deliberation, and we do have some time here, maybe 20
4 minutes and slightly longer. So I'm throwing it open
5 to Board members for your suggestions and comments,
6 discussion.
7 MR. JENKINS: Can I ask a question of the
8 Executive Secretary?
9 MR. BRADFORD: Yes.
10 MR. JENKINS: This was mentioned in your
11 brief?
12 MR. BRADFORD: Dane, this is directed to
13 you.
14 MR. JENKINS: And then you mentioned it in
15 your closing and that is the idea of the DOE -- I'm
16 assuming it's under TRCA -- will only accept
17 by-product material. Have they made a -- or have you
18 requested that they make a decision specific to the
19 end product whether we're calling it by-product or
20 whatever with respect to this material?
21 MS. LOCKHART: No, not DOE. It is NRC that
22 has concluded this is by-product, a sister agency.
23 And they also have authority in that statute. I guess
24 you're asking could there ultimately be a conflict
25 between DOE and NRC. I don't know the answer to that.

1 DR. NELSON: Okay.
2 MR. BRADFORD: I was going to say, I'll
3 entertain a motion if someone is feeling that --
4 DR. NELSON: I don't want to -- I always do
5 a lot of talking, and I slap myself after and say this
6 is the last time I'm going to talk so much. But if
7 you don't mind, I would like to make a few
8 observations.
9 I was part of -- I was actually a member of
10 the task force that investigated making a
11 recommendation as to whether or not the State should
12 become an agreement state for this issue, and we have
13 agreed and we've agreed to abide by the NRC's
14 definition of that adverb primarily.
15 I thought that Judge Block's ruling was
16 absurd then, and I think it's still absurd, but I
17 think that we have to take the fact that we have
18 agreed with that definition in order to become an
19 agreement state very, very seriously before we think
20 of doing something else.
21 I'd also like to point out to the Board
22 members that the Board actually has a position
23 statement on alternate feed that is on the website. I
24 brought some copies if you're interested to see what
25 your position is. I think Dianne and I are the only

1 ones standing from those days, probably.
2 I think alternate feed is always going to be
3 disposal from someone's perspective. And I think
4 given that that is a reality, you know, we're going to
5 have to remember that it's always going to be
6 contentious. Someone is always going to view it as
7 disposal. And I think we're going to have to think
8 very carefully before we abandon what we agreed -- in
9 terms of guidance what we agreed to, but that may be a
10 decision no one wants to make.
11 MR. DeROSSO: So what is our position
12 statement on alternate feed?
13 DR. NELSON: Just happen to have copies.
14 MR. DeROSSO: Oh, it's pages. Never mind.
15 DR. NELSON: It's two pages. It's never
16 been rescinded. The spirit of it is somewhat at
17 variance with agreement state -- the agreement state
18 policy.
19 MR. BRADFORD: I think in a way it was
20 somewhat rescinded when the agreement state status was
21 accepted. It was never formally withdrawn, but it was
22 overwritten.
23 DR. NELSON: That might be a motion that
24 comes out of these deliberations at some point.
25 MR. DeROSSO: Maybe I can just offer an

1 opinion here based on what I've heard today. I mean,
2 if we're basing this ruling as to whether it's
3 acceptable to have IUC accept Fansteel material, if
4 it's based on whether we can demonstrate any
5 incremental increase in environmental or public health
6 hazards, I would probably say that you'll never be
7 able to demonstrate that based on the science that we
8 have right now.
9 The mill has been operating for 27 years.
10 We can't tell right now from the groundwater studies
11 that we've done whether the cells are leaking. So
12 adding a little more to this bucket -- I'm not saying
13 it isn't going to cause an incremental increase to
14 environmental or public health damage, but we're not
15 going to be able to detect that with our existing
16 technology.
17 So how do we respond to that situation if
18 you agree that situation exists? If we can't
19 demonstrate, does that mean there's not going to be an
20 incremental increase, or is it that we just can't
21 measure it? If we can't measure it, does it exist?
22 It's kind of a dilemma for me.
23 If that's solely what we're basing this
24 ruling on, I would say it doesn't matter to accept
25 this material. It's not going to -- can't demonstrate

1 harm. And if there's constantly being put similar
2 material into the cells right now, I don't see how it
3 matters much.
4 I do take exception with the fact that it
5 has a lot of cadmium, and I think there are some
6 worker issues that probably need to be addressed. I
7 know that's not germane to this Board or this
8 conversation right now. But I disagree with that
9 level of cadmium in that source material not
10 presenting worker issues.
11 But my opinion is I don't think this
12 Fansteel will change the situation at the site. I
13 think there's a bigger picture as to whether these
14 cells are leaking. Whether the site itself down the
15 road is going to demonstrate some harm to the public,
16 that's not I think our decision right now at this
17 point. If we're looking at the Fansteel, I would say
18 it's probably acceptable.
19 MS. LANGIANESE: My job as a commissioner in
20 Grand County is to --
21 MR. BRADFORD: Would you hand the
22 microphone?
23 MS. LANGIANESE: -- is to really oversee the
24 health and safety and welfare of our community in this
25 particular situation even though there's no evidence

1 to show that there isn't any health and safety issues.
2 I don't think that -- in my opinion that's not enough
3 to say we really shouldn't be thinking about this
4 material that's coming into IUC.
5 I also am finding it somewhat ironic that we
6 have a 17-million-ton pile of uranium up in Grand
7 County that's going to be moved at the cost of
8 somewhere around six to $800 million. And there's a
9 reason for that, and that's because it's leaking and
10 contaminating the river and killing the fish. And
11 there's actually studies showing this contamination is
12 going under the river into the sloughs on the other
13 side of the river.
14 Some of the reasons for that study were
15 based on the fact that this area is very complicated,
16 and we don't really -- I mean, we're being recommended
17 to spend $2 million to do a hydrology study because it
18 is so complicated. And I would assume that's the same
19 here. You know, I don't know that. I'm not a
20 scientist. I don't understand all the issues
21 surrounding how you determine what happens when the
22 water goes into -- you know, when the contaminants go
23 into the groundwater. But I don't feel it's a risk
24 that's worth taking.
25 We didn't hear from any of the people that

1 live around here. I know that at the time that we
2 were talking about the tailings pile they were very
3 concerned about that those tailings coming down here
4 to IUC, which was one of the options at the time. In
5 fact, they were one of our stakeholders, and they were
6 very concerned. And they expressed that their
7 groundwater was being contaminated. And we didn't
8 hear any of that today which kind of surprised me. I
9 thought we would hear something from those folks.
10 I guess my point is, in responding to you,
11 Frank, even though there's no evidence of that right
12 now, I think it's something that we should really
13 always pay attention to as far as the health and
14 safety of not only the fish in the river and the
15 wildlife and the plants, but more importantly the
16 people that live around here.
17 MR. JENKINS: I guess I would like to make a
18 comment, too, regarding, you know, those contaminants
19 that we can or cannot detect. There was testimony
20 given that, you know, these things were less than the
21 detection level. Well, as scientists we -- especially
22 in environmental health physics where we are
23 constantly monitoring the transport of radionuclides
24 through the environment -- water, soil, air, and
25 everything -- it's always debated how we handle less

1 than detection level valves. Some people call it the
2 semantics of measuring zero.
3 However, a lot of times -- and this is how
4 the scientists handle it. How do we handle those
5 values? Is a less than detection level counted as
6 zero, or do we take a conservative approach and assume
7 that it's at least the value of the detection level?
8 And so are we really not detecting these things in the
9 environment, or is it -- are we saying we're not
10 detecting them just because of the semantics of
11 measuring zero? And I think that's something that --
12 I know it's a -- it's a fairly esoteric. But the idea
13 of saying something is not there when it is, may be a
14 limitation of our science.
15 And then we are trying to say let's take the
16 conservative approach to this at every turn. And then
17 all of a sudden we're dropping off a whole half of our
18 dataset just because of some arbitrarily defined
19 detection limit. Formerly working in DEO oversight,
20 the way we would do that -- I mean, the way we would
21 get around that is we would decrease our detection
22 level to the point where it was either, you know, no
23 longer meaningful or that we could actually measure
24 that. And that's something that's handled with time,
25 and I know that time is money, and those types of

1 things.
2 However, I -- we refer to this groundwater
3 report. The transport of nuclides through the
4 environment is primarily observed most readily in the
5 groundwater. The testimony was given about the
6 facility in Wyoming that after the fact when they went
7 in there and did some additional testing that they
8 found that there was a problem. I know at the
9 majority of the DOE facilities the old standard of
10 practice for gathering these samples showed that there
11 was not a problem, then after the fact we're finding
12 all these plumes in our groundwater.
13 They may or may not be significant to the
14 toxicity of humor or other nonhuman biota. But
15 nevertheless, I think it's something we could pay
16 closer attention to in establishing, you know, is this
17 meaningful zero or is it a nonmeaningful zero. And I
18 for one would like to spend some time going through
19 this background report and try to tweeze out: How did
20 they handle that zero?
21 Dr. Nelson here pointed out some
22 discrepancies just in reviewing the summary table
23 data. I would be interested in seeing the
24 uncertainties in those datas coupled with this idea
25 that I just touched upon which is this idea of

1 counting zero.
2 MR. BRADFORD: Thank you. Just one comment
3 along the line of the groundwater report. I
4 appreciate that it was provided to us, but I also have
5 some concern that if we use that too much in making a
6 decision here, if that's a key point, then that
7 worries me a little bit because it hasn't been
8 approved by the Agency yet, it hasn't been reviewed.
9 And I would like to see them do their review and
10 whatever back and forth they need to with the mill to
11 come up with an agreed, you know, plan and approach
12 there before we, you know, act on it. I think that's
13 more prudent. We may be ahead of the ball there if we
14 use that before it's a final document.
15 DR. NIELSON: I'd like to talk just a minute
16 about the groundwater permit and the authority and how
17 I see that as a different issue than the groundwater
18 issue that's really before us. I believe it is true
19 that our Water Quality Board is the entity that has
20 authority over that permit, but I don't think that's
21 the issue that's before us today.
22 I think the issue before us today is the
23 statement that was made in the application for this
24 license amendment and a determination of whether it's
25 in fact accurate based on what we've heard today. And

1 the determination in the application under 4.6
2 referenced NRC staff's conclusions from a 1997 EA that
3 there wasn't -- that the mill site will not be
4 adversely -- I'm sorry, that the groundwater beneath
5 the mill site wouldn't be adversely impacted by
6 continuing operations. And then there was a statement
7 by IEC that the mill tailing cells are not impacting
8 groundwater and the receipt and processing of this
9 additional material wouldn't have an incremental
10 impact. I think that's really the issue before us.
11 The groundwater permit is a broader concern,
12 and I think that the background report is going to be
13 an important determination there. The thing that
14 concerns me about the groundwater determination that
15 we are being asked to make today is that I don't think
16 we have the data to support the statements that were
17 being made by experts today.
18 The statement was that there were background
19 levels that were high and anomalous upgradient and
20 downgradient from the cells, that it was a variable
21 condition in terms of the chemistry of the
22 groundwater, and that if you saw anomalous numbers in
23 the groundwater you shouldn't interpret them as
24 automatically coming from leaking cells. And yet we
25 didn't have any information that clearly --

1 particularly in the background report that we have
2 received that demonstrated that that was the case,
3 that prior to construction of the cells and during the
4 first three years of operation that those anomalous
5 values existed.
6 And the groundwater background report that
7 we received didn't touch on those areas. If there was
8 one report that should have talked about that, it
9 would be that report. And that concerns me. I don't
10 think we had all the information we needed.
11 I think that incremental differences or
12 adverse impacts look a little bit different if you're
13 talking about whether you're below a standard or
14 whether that incremental difference takes you over a
15 standard. But frankly whether you're looking at a
16 clean environment and adding something that
17 incrementally will make it dirty or whether you're
18 looking at an environment that is already contaminated
19 and adding a little bit more contamination that will
20 make it worse -- neither makes it right, and that's
21 why we've got environmental standards.
22 So I don't know quite what to suggest in
23 terms of groundwater. But I'm not convinced that for
24 all the good work that the Division has done -- and
25 beyond this issue even with the groundwater permit,

1 I'm still concerned we don't have a clear answer.
2 With respect to whether this material should
3 be processed based on the definition of alternate feed
4 by-product material, I think it meets the definition
5 that's been provided. And if that were the only issue
6 here, I would say that they had met their
7 determination.
8 But the groundwater bothers me, and I don't
9 think we've answered that question. And I think that
10 has to be decided in the overall decision.
11 DR. MINER: Dianne, would you bring that
12 screen up again? You keep leaving off the last of
13 that statement. It says as a result existing
14 groundwater -- sorry. It reads, "Because the mill's
15 tailing cells are not impacting the groundwater, the
16 receipt and processing of uranium material at the mill
17 will not have any incremental impacts on groundwater
18 over and above existing licensed operations."
19 And that was the statement that is made, and
20 that actually supports what Frank has said, is that we
21 probably would never be able to show any incremental
22 impacts over and above existing licensed operations.
23 And I think it was understood there probably
24 is some leakage that goes on because there's no
25 perfect lining. Particularly that lining is not

1 perfect from that long ago. But whether or not it
2 would be a significant change from what we have,
3 probably not.
4 But the monitoring is ongoing. We'll
5 continuously be able to know what the monitoring
6 shows, and I don't think that we'll -- that adding
7 this material to their process and then the final
8 waste to get into the waste cells will have any
9 incremental impact over and above existing licensed
10 operations.
11 MR. DeROSSO: Just to clarify what I said,
12 I'm not suggesting that we stop monitoring the site
13 and that -- don't look forward and see whether these
14 liners are leaking and whether we stop processing and
15 putting anything further into the cells at this point.
16 I'm restating myself. This little bit isn't going to
17 change anything in the short term. I think we still
18 need to look in the big picture and look down the road
19 and continue the monitoring program and decide whether
20 this is a wise thing down the road to put anything in
21 these cells.
22 DR. NELSON: Very quickly. 32,000 -- I
23 don't mean this in a pejorative sense, believe me.
24 But 32,000 tons of whatever comes out of that back
25 door of that mill is not nice stuff. And so one way

1 to view this is -- as Frank has said, is would
2 32,000 tons of -- up to 32 thousands tons of Fansteel
3 material make matters worse than 32,000 tons of, say,
4 conventional Colorado plateau ore.
5 But I have in my long years on this Board
6 learned to have a lot of respect for what Dianne says,
7 and so I guess what I'm going to ask is, Dianne, could
8 you repeat your concern about the groundwater issue
9 again because -- your remaining concern because I'm
10 not sure I grasped it. I guess it's a long way of
11 saying I'm stupid.
12 DR. NIELSON: First of all, I'm saying I
13 think the groundwater issue is appropriately before us
14 because it's specific to this license amendment. And
15 my concern is that we don't -- that we don't have the
16 information before us to be able to make a
17 determination that processing this material at the
18 mill will not have any incremental impact in
19 groundwater over and above the existing licensed
20 operations because a lot of information that we've
21 heard has been based on looking at monitoring wells
22 and what we're collecting today and what was collected
23 in the past. And I'm struggling with how you
24 interpret that incremental impact and if we really
25 have sufficient information at this point, I guess, to

1 be able to determine that.
2 DR. THOMSON: I would ask if not, is the
3 data available or obtainable to this committee in a
4 timely manner to make a decision or to render what
5 needs to be done? If we don't have that information,
6 can we get that information or is it obtainable or
7 should we?
8 MR. BRADFORD: You've asked a very good
9 question, and I think the same thing. I'm not sure it
10 is attainable. I'm not sure it is possible to measure
11 the incremental difference between this batch of
12 alternate feed and a batch of conventional ore or any
13 one particular batch when you're mixing it into the
14 large tailing cell that's already there, whether you
15 can measure any incremental difference or how you
16 would go about it.
17 MR. CONE: I'll make a couple of comments
18 here. First, I think at some later date I would like
19 to revisit our definition of the word ore. It would
20 only be the government that would talk about digging
21 up rocks and never making a profit with it.
22 I'm a mining engineer. I was beaten in the
23 head with it for all my years that ore that has no
24 value is called rock. And being a resident of Park
25 City, all the skiers ask me if there's ore in the

1 mountains. I say, well, no, if there's ore in the
2 mountains, it would be out of the mountains because it
3 had value. So I think we need to revisit that in the
4 future because that's not the correct definition in
5 any commons sense world in the mining industry.
6 My concern is I suspect there's problems
7 with these containment cells, these tailings ponds. I
8 think we saw some data that groundwater issues in the
9 data worried me, and I think that that merits some
10 more investigation.
11 Whether a little bit more going into the
12 cells is going to be a problem, it will be that much
13 more, yes, and I wouldn't be prepared to think about
14 putting something else in there until I knew those
15 things had integrity and we're not going to
16 contaminate. A lot of these things don't show up for
17 years and years and years, as you know. So our
18 decision today are things that are going to be taking
19 place in the future and affect people's health,
20 safety, and welfare, which is what our mandate is.
21 I also agree with Director Nielson. I don't
22 think we have enough information -- have been given
23 enough information, and personally I would remand it
24 back to the DRC to review some of this and look into
25 that. That's my main concern right there.

1 DR. MINER: I'll make a little bit more
2 comment. It's already been acknowledged that the
3 technology there in the cells as they are now is not
4 ideal. So it's not going to be what we would expect
5 today, and that's what DRC has acknowledged very
6 clearly.
7 But I don't think that continuing their
8 operation as it is with or without Fansteel material
9 is the question. I think they're licensed to continue
10 at least with other materials and that the Fansteel
11 material doesn't make any significant change with
12 what's already happening with their procedure with
13 their current technology in those ponds.
14 Yes, future ponds and pond 4A is being
15 retrofitted to be accepted by today's technology. But
16 we can't expect today's technology to be present for
17 an ongoing operation that was licensed many years ago
18 and is properly operating under that technology.
19 DR. NELSON: I'm going to ask a question.
20 It may end up being rhetorical. If we're concerned,
21 and I'm not saying -- I'm not going to give an answer.
22 I'm just going to ask the question. If we're
23 concerned that we don't have enough information to
24 make a decision about Fansteel, does that mean we
25 don't have enough information as to whether any

1 additional material should go in that tailings
2 impoundment? because that logically follows.
3 MR. BRADFORD: I think perhaps we're getting
4 a little too broad here. I mean, the questions that
5 are being raised are certainly good ones, and I think
6 that -- you know, we don't know at this point if the
7 cells are leaking, we don't know the condition of the
8 liner. But I have full confidence in Loren and his
9 staff and DRC. And they're going through that
10 process, and I have confidence that when they have
11 adequate scientific data that demonstrates there's a
12 problem that they will work with the company to come
13 up with remedial measures.
14 But until we know that for certain, I think
15 it's, in my opinion, inappropriate for us to interfere
16 with a commercial operation that is doing licensed
17 activity that they are already permitted to do and to
18 move forward with. There's a problem that needs to be
19 dealt with, but the issue of accepting this material
20 seems to me to be a different matter.
21 And certainly we can always have more data,
22 but, you know, two large packets arrived in the mail
23 that dealt with this one small, in the overall
24 picture, amendment. If you want to start getting into
25 the overall operation of those ponds and all of the

1 statistical evaluations that are going to need to
2 happen to determine whether they're leaking or not,
3 you haven't seen nothing yet.
4 So I think, you know, I'm comfortable with
5 the Division moving ahead as the technical experts
6 there in their oversight role. And I would just maybe
7 caution a little bit that we should not be jumping
8 into that until at least Loren and his staff have had
9 time to review the groundwater report and make any
10 recommendations they need to to us, and then we can
11 act on them at that point.
12 DR. NELSON: I just want to be clear that I
13 wasn't necessarily suggesting anything further than
14 acting on this Fansteel material. I was just trying
15 to draw it to its logical conclusion.
16 MR. BRADFORD: Understood.
17 I'm not hearing any motions.
18 MR. OMAN: I want to make one small comment.
19 I draw diagrams to figure -- when I go through here to
20 figure out what's going on. I draw me one. Whether
21 anybody else can make sense doesn't matter. I was
22 thinking back when uranium business started up and
23 people were digging around in the hills, throwing
24 rocks in the saddle bags on their donkeys, hauling
25 them down or whatever they did to get the ore

1 somewhere.
2 And one of the things I was thinking related
3 to this was the fact that where is the donkey and
4 where is the ore in this situation. We had something
5 that there was going to be a processing fee, and I
6 wondered when the old prospector was there was there a
7 processing fee at the mines. Is this similar to the
8 same thing of thing they did? They brought their
9 material to get the uranium out of it. Did they take
10 a cut -- the mill take a cut? How did that work? I'm
11 assuming that's the way it is.
12 I wonder if we would even be talking about
13 this if it wasn't the fact that it was something from
14 out of state that was in a little different
15 configuration than we normally think uranium is, and
16 would we be having this discussion, would we be
17 worried about the end product of the mill, whatever it
18 was, going to the ponds other than the fact that it
19 was from some other place that's been decommissioned.
20 Those are things I'm milling around in my
21 mind. Does this stuff really make a difference if we
22 have a million tons in there already? They're looking
23 at 16,000 tons to about 32,000 tons. That's a really
24 small fraction of what's already in there. Is that
25 going to raise the level of the water in the pond or

1 the mass? We just don't know those kind of things.
2 But I'm beginning to think that even the
3 stuff will be hauled, I guess, on railroad cars or
4 trucks or whatever, different kind of donkey than the
5 initial miners that went up into the hills, but it
6 still ends up being stuff that has stuff in it.
7 The thing that really conflicts me is: Are
8 they going to get stuff out of it? We've had
9 testimony it has stuff in there, we get yellowcake out
10 of it, which is really important in this day and age.
11 Particularly as we deal with energy problems around
12 the world it may be more important.
13 The question of sham processing has been
14 kicked around here for several years, I think, ever
15 since Dr. Bozeman, the guy that preceded me here. He
16 talked to me about this stuff. So I know these
17 questions are all around us.
18 I'm sure that if they actually mill and
19 process stuff, they sell it, so they have receipts of
20 their sales so we know stuff is being sold and milled.
21 So I guess I think the question we have to ask
22 ourselves now is the same sort of thing that Kent just
23 said. Do we place some trust in our experts to keep
24 monitoring this water? Do we allow them to handle
25 this "ore", mill the uranium out of it?

1 If there's water problems, then the
2 remediation comes through. Then does the company kick
3 in and have to pay for that remediation and handle
4 those problems if they occur? So that's kind of a
5 problematic conditional thing.
6 I guess what I'm trying to say is I'm trying
7 to focus in on the same thing Kent is suggesting.
8 Shall we take this stuff and let them mill it, is it
9 going to make a big difference, and then deal with the
10 water stuff later? I'm tending to think that maybe it
11 may not make that much difference in what's happening.
12 But I am concerned like everybody else that
13 if this stuff is percolating in there, what's it going
14 to mean 100 years from now or 200 years from now or
15 sometime down the road. That's something we need to
16 keep an eye on.
17 MS. GORYUNOVA: I'm just going to give to
18 the Board what we have to decide today. As I look at
19 it, the subject of our consideration -- first, I am
20 thinking that it may be about licensing process. If
21 it's about licensing process, then we probably should
22 get back to the reclamation and see if reclamation has
23 been made and everything is in accordance with
24 reclamation. Second, it's a Fansteel question. And
25 the question I'm asking myself here is: Does it make

1 a difference if it's alternate or if it's ore that's
2 being processed there? Does it really make a
3 difference in the impact on the environment? And I
4 think those two questions can be answered within this
5 meeting.
6 But if it's not about first and second and
7 it's the third tier -- and third tier is really about
8 groundwater -- then I feel like I don't have enough
9 scientific data to make a judgment. And I feel
10 uncomfortable in that particularly because I'm not an
11 expert in water, and maybe we should defer that
12 particular question to a specialist on that. And I
13 don't know if we should invite them to speak before us
14 or maybe we should refer to the Water Quality
15 Department.
16 So I guess it's up to everyone how we decide
17 on those three tiers, but that's how I see it. Either
18 it's a licensing problem and we make a decision on
19 that or it's a problem with alternate versus ore or
20 it's the water problem.
21 MR. DeROSSO: Are you ready for a motion?
22 MR. BRADFORD: The Chair would entertain any
23 motions that happen to float by.
24 MR. DeROSSO: Well, it's either going to be
25 accepted or denied, and then I guess we're going to

1 table it to the next meeting. So I'll move that the
2 Board accept DRC's acceptance of the Fansteel and
3 allow IUC to move forward with the processing of that
4 material.
5 DR. MINER: I'll second that.
6 MR. BRADFORD: We have a motion and a
7 second. Would you restate it one more time?
8 MR. DeROSSO: I move that we follow the
9 Division's recommendation that -- or allowance of IUC
10 to process Fansteel material.
11 MR. BRADFORD: Okay.
12 DR. MINER: I second that.
13 MR. BRADFORD: Discussion on the motion.
14 DR. NELSON: I have a question. When is it
15 appropriate to offer a substitute motion?
16 MS. LANGIANESE: Now.
17 DR. NELSON: I can offer a substitute
18 motion.
19 MR. DeROSSO: If you could be more
20 articulate, please.
21 DR. NELSON: Okay. I'd like to offer a
22 substitute motion and I hate deferring things. But in
23 deference to those who still have concerns about
24 groundwater, I would offer a substitute motion that a
25 decision be delayed at least until our next meeting

1 next Friday so those that have concerns can read the
2 background groundwater report and amendment. That's
3 my motion.
4 MR. CONE: Second it.
5 MR. BRADFORD: I guess the concern I have
6 with that, Dr. Nelson, is the background groundwater
7 document was provided to us with all the other
8 materials, and while it's certainly understandable we
9 haven't read everything in detail because of the large
10 volume of it, providing additional time for one
11 document over others seems a little bit perhaps
12 unfair.
13 MR. OMAN: Clarification. My understanding
14 was because the legislature is session no meeting
15 until March 2, not February 2.
16 MR. BRADFORD: We can meet next week if we
17 need to, but if we come to a resolution today, there
18 will not be business to warrant a meeting next week.
19 DR. NELSON: I would observe for the Chair
20 that there's an issue of fairness when the first time
21 you see this report is today.
22 MR. CONE: One way to get around that
23 question would be to reject the report and not include
24 it in our information.
25 MR. BRADFORD: Well, for a substitute

1 motion -- Frank, are you willing to accept that as
2 your substitute, or do you want to go with your
3 original motion?
4 MR. DeROSSO: I'll even second it if we get
5 moving on this decision.
6 MR. BRADFORD: So the motion, then, is to
7 postpone the vote. The motion is to accept DRC's
8 license amendment and -- but we would postpone the
9 vote until a week from today at our meeting next
10 Friday.
11 MR. DeROSSO: I'm fine with that.
12 DR. NIELSON: What does it mean to accept
13 it? I'm not sure I understand the first part of it.
14 Are we not just delaying the decision until Friday? I
15 don't think we're accepting.
16 MR. BRADFORD: I thought you were -- I
17 thought all you were adding was a time delay on his.
18 DR. NELSON: No. I'm saying my motion is
19 better than yours.
20 MR. BRADFORD: You're saying there is no
21 motion to either accept or to make a decision, just
22 simply to postpone for a week.?
23 DR. NELSON: So that those who wish to read
24 the report, may.
25 DR. NIELSON: Mr. Chairman, do we have a

1 second on the substitute?
2 MR. CONE: I did.
3 DR. NIELSON: I think the process if you've
4 got a substitute and second is you have to vote the
5 substitute first, and then depending on what happens
6 with the substitute, you can go back to the other
7 motion.
8 MR. DeROSSO: We can do that.
9 MR. BRADFORD: So we're voting now on the
10 substitute motion which is to postpone the decision
11 for a week and to hold a meeting.
12 MR. PATTISON: Telephone?
13 MR. BRADFORD: I think we're going to need
14 to meet, but we can certainly conference call in those
15 who couldn't attend. We can make that provision.
16 DR. NIELSON: That would be fine.
17 MR. BRADFORD: Any other discussion of that
18 motion? Is it clear what the motion is, then? The
19 motion is to postpone. All in favor say aye.
20 BOARD MEMBERS: Aye.
21 MR. BRADFORD: All opposed say no.
22 DR. MINER: No.
23 DR. THOMSON: No.
24 MR. OMAN: No.
25 MR. BRADFORD: Can I see a show of hands on

1 the nos? There are three nos. All in favor say
2 aye -- or raise your hand.
3 MR. DeROSSO: I'm okay with waiting.
4 MR. BRADFORD: So the motion carries to
5 postpone. And for the record, the Chair abstained on
6 that vote.
7 So we will then convene next Friday at 2:00
8 o'clock at the DRC offices for a February Board
9 meeting at which time we'll reconsider this. We have
10 a request to meet at 1:00 o'clock instead of 2:00
11 o'clock next Friday. Okay. We will -- 1:00 o'clock.
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1 REPORTER'S CERTIFICATE
2 STATE OF UTAH)
) ss.
3 COUNTY OF SALT LAKE)
4 I, Diane W. Flanagan, Registered Professional Reporter and Notary Public in and for the
5 State of Utah, do hereby certify:
6 That prior to being examined, the witnesses were duly sworn to tell the truth, the whole truth,
7 and nothing but the truth;
8 That said proceeding was taken down by me in stenotype on January 26, 2007, at the place therein
9 named, and was thereafter transcribed, and that a true, and correct transcription of said testimony is
10 set forth in the preceding pages;
11 I further certify that I am not of kin or otherwise associated with any of the parties to said
12 cause of action and that I am not interested in the outcome thereof.
13
WITNESS MY HAND AND OFFICIAL SEAL this 5th
14 day of February, 2007.
15
16
17
18 _____
Diane W. Flanagan, RPR
19 Notary Public
Residing in Davis County
20
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